

## Interdisciplinary and Practical Courses

This is the era of interdisciplinary research, multidisciplinary studies, and convergence of scholastic pursuit. At this turning point of academic field, we would like to offer the classes that cannot be sustained by itself or within one major without the cross-support of other academic area.

- Culture of 21st Century: interdisciplinary cultural discussion
- Basis of Philosophical Total Management
- Application of graduate studies to real world.

### ☐ Courses

#### • **Understanding of Culture (2)**

This course intends to critically analyze and investigate the nature and characteristics of modern society in relation to modern culture by drawing on an interdisciplinary approach.

#### • **Philosophical discourses (2)**

Philosophy had been reduced to only one of many departmental sciences or a mere organizer for them, which led to human alienation and discrepancy between human beings and society. The more diversified the departmental sciences evolve, however, the more relevance the role of philosophy connecting them gets. Interdisciplinarity between various studies becomes more and more important. This course aims to satisfy the need of philosophical thinking and discourses on various fields of sciences, interconnect them and ultimately enhance scholarly abilities.

#### • **Understanding management and new venture creation (2)**

The subject provides basic knowledge of new venture creation and management for the non business major graduate students with entrepreneurial vision. The class focuses on real world experiences and practical understanding rather than academic knowledge, by means of case analysis and invited lectures.

#### • **Statistics (2)**

This course will familiarize you with the fundamental statistical methods necessary for

conducting and understanding applied research : Beginning with a review of the basic elements such as collecting and organizing data, assumption of normal distribution, measurement of scale, measures of central tendency of variability: concluding with hypothesis testing, analysis of variance, basic non-parametric statistics, correlation and simple linear regression.

- **Communication for Teaching (2)**

This course is for teachers-to-be who will work in educational institutions after completing their graduate studies. Teaching is carried out through communication. Students learn in this course practical ways of communication, indispensable to effective teaching, through various methods of theoretical and practical training.

## **Dept. of Korean Language & Literature**

Department of Korean language and Literature offers systematic and balanced curriculum on Korean linguistics and classical and contemporary literature to establish a solid foundation, which allows students to go on for a more advanced study. The courses are intended to provide students with profound and future-oriented views on each subject. With emphasis on historical tradition and universality of the Korean language and literature, both synchronic and diachronic perspectives are considered. The ultimate goal of the department is a creative succession and development of the tradition of Korean language and literature.

### **❑ Korean Language Major**

The goal of the Korean Language Major is to enable students to have a solid background on various theories of Korean linguistics in general and to make clear the various meanings of 'national language' on the ground of theoretical methods and reading. Through courses on such topics as stylistics, grammar, phonology and morphemics, we seek to examine unique characteristics of Korean language. Furthermore, we continue to explore spirit of Korean nation reflected in Korean language.

### **❑ Korean Literature Major**

The goal of Korean literature major is to broaden understanding on Korean classical and modern literature. For classical literature, we discuss the values and meanings in Korean literature on the bases of readings of representative literary works. Through the historical studies of Korean literature works, we endeavor to succeed to the Korean literary tradition. For modern literature, we seek to find out aesthetic-consciousness and the process of modern changes.

### **❑ Teaching Korean As a Foreign Language Major**

The goal of Teaching Korean as a Foreign Language Major is to cultivate creative Korean language educators and researchers who can communicate across the world. Our mission is to enable students to develop ability for education and Research and Development in the area of teaching Korean as a Foreign/second language through courses on such topics as Studies on Korean Grammar, Foreign/second Language Acquisition, Contrastive Linguistics, Studies on Korean Language Education, Korean Pedagogical Grammar, Teaching Expressive Skills in Korean, Teaching Comprehensive Skills in Korean, Teaching Korean Pronunciation, Teaching Korean Vocabulary, Curriculum Design, Assessment & Testing of Korean as a Foreign Language, Teaching Korean Culture, Practicum in Korean Language Classrooms.

#### □ Core Courses

- Studies on Korean Stylistics (3)

In this course, we will explore stylistic characteristics of various Korean literary works. We will examine these from the perspectives of literature, linguistics, and psychology. Further, we will discuss how to describe, interpret and evaluate those stylistic characteristics.

- Studies on Korean Language Education (3)

The purpose of this course is to enable students to obtain knowledge and professional skills in Korean language teaching. During this course, students will critically examine issues related to the concept and methodology in language teaching. Textbook and curriculum design will also be examined.

- Studies on Deciphering Classical Korean Poetry (3)

In this course, we will examine forms and meanings of classical Korean poems, which are written in borrowed spelling (*chaja*) or *Hangeul* which are published in Shilla Dynasty, United Shilla Dynasty, Goryeo Dynasty and Joseon Dynasty. Through this examination, students will discuss on knowledge of correct interpretation of Korean literature and Korean linguistics.

- Studies on Modern & Contemporary Korean Language and Literatures (3)

In this course, we will examine characteristics of language use and literary achievement during the transitional period between modern and pre-modern period through reading various works at this time. Furthermore, we will seek to find ways of studying linguistic and literary characteristics from the viewpoint of interdisciplinary approach.

- Independent Study (3)

Students can choose and study on research topics or projects of their own interests with their professors, which are not dealt in regular curriculum.

- Studies on History of Classical Korean Literature (3)

Studying the flow of the history of the classical Korean literature divided according to the periods, we consider the phase of the classical Korean literature by each period and consider what are the same and different quality that connect the preceding and the following period.

- Studies on History of Modern Korean Literature (3)

As we study the flow of the modern Korean literature in the historical aspect, consider the base point of that. On the ground of this studies, we study the early modern

Korean literature(beginning from the new novel) from the point of the history of the literature according to the flow of the early modern trend of literary thoughts.

- Studies on Methodology in Korean Linguistics (3)

Grasping the special phenomenon and typologic peculiarity of the Korean Language, we re-illuminate and re-explain those in the light of the various linguistic theories and consider the methodology through which explain the real phase the Korean Language exactly. Being indebted to the tradition of the independent studies including Ju-Si-Kyung's methodology, we search the methodology through which minimize the reaction of the western theory application to the Korean studies.

□ Korean Language Major

- Studies on Korean Grammar I (3)

The purpose of this course is to newly examine morphology, syntax, and grammar of Korean language through various methodologies of such theories as structuralism, transformational generative grammar, formalism, functionalism, discourse analysis, and cognitive grammar. Considering linguistic characteristics of Korean, we will seek to find a grammar that can explain various phenomena of Korean language effectively.

- Studies on Korean Phonology I (3)

On the ground of traditional and modern phonological theories, we will look for methodologies for explaining Korean phonological system and structural changes of phonologic combination. Further, we will practice analyzing data to find out various phonological features.

- Studies on Korean Morphology I (3)

In this course, we will examine morpheme combinational changes and functions, and explore processes and patterns of word formation from the points of views of structuralism, and generative grammar. We will further expand and deepen our discussions in relations with morphophonemics, lexical semantics, and considering historical changes.

- Studies on Korean Syntax I (3)

In this course, we will take new perspectives on syntactic structure and phenomena of Korean language through various methodologies of such theories as transformational generative grammar, and functionalism. Considering unique characteristics of Korean language, we will seek to find new ways to describe Korean syntax in a more practical way.

- Studies on Korean Semantics I (3)

In this course, we will discuss meanings of Korean words, sentences, and utterances considering both diachronic changes and synchronic system through the methodologies of lexical-semantics, syntactic-formal semantics, pragmatics, discourse-text linguistics, and cognitive semantics.

- Studies on Old Korean and Chaja Pyogi (3)

In this course, we will discuss orthography, phonology and grammar of Old Korean which covers pre-historic era, Three-Kingdom period and the Unified-Shilla period. We will learn and translate *hyangchal* of Shilla, *idu* and *seokdok gugyeol* data of Goryeo period to modern Korean by comparing with Altaic languages or by using restoration method.

- Studies on Middle Korean (3)

In this course, we will explore Middle Korean (from Goryeo period to the 16th century) synchronically and diachronically in terms of its orthography, phonology, grammar, and meaning. Especially, we will focus on the period when *Hunminjeongeum* was created and look into the changes from the later Middle Korean to the Early Modern Korean.

- Studies on Early Modern Korean (3)

In this course, we will explore Early Modern Korean (from the 17th Century to the civilization period) synchronically and diachronically in terms of its phonology, grammar, and meaning. Examining spoken language data and the data without annotating in Korean, we will examine changes from the Middle Korean to the Modern Korean.

- Studies on Historical Phonology in Korean I (3)

In this course, we will first review general theories on phonological changes. Then, we will explore phonological characteristics of each period by discussing phonological system, structure of phoneme, phonological combination and phonological phenomena. Further, we will learn methodologies for analyzing phonological changes and characteristics.

- Korean Pragmatics and Discourse/Text Analysis I (3)

In this course, we will examine Korean discourse and text linguistics in terms of types, structures, elements, and functions of texts. We will discuss how to describe and explain Korean discourse systematically in detail.

- Studies on Historical Korean Language Texts (3)

The aim of this course is to enhance students' understanding of researching on Korean language history. We will look into historical Korean texts from ancient, medieval and modern times examining diachronic changes of Korean language.

- Studies on Sociolinguistics (3)

The aim of this course is to explore the linguistic variation of Korean language depending on various social factors. The major methods and principals of sociolinguistic study will be introduced. This course will enable students to develop skills in collecting, analyzing and reporting data using the methods most relevant to studies in sociolinguistics.

- Studies on *Hunminjeongeum* and Writing System Theory (3)

In this course, we will discuss on motivation, process, phonological background of *Hunminjeongeum* and further examine its orthographic characteristics. The discussions will be based on the studies on *Hyeryebon* and later studies, and seek to reinterpret its scientific features from the perspectives of modern linguistic theories.

- Studies on History of Korean Linguistics I (3)

In this course, we will review tradition of Korean linguistic study in terms of its objectives, contents, subjects of study, and characteristics of methodologies. The discussion will be focused on views on writing system, methodologies of Korean linguistic studies, and adaptation of foreign theories which are realized in *Hunminjeongeum*.

- Studies on History of the Korean Language I (3)

In this course, we will first review general theories on linguistic changes, and then explore internal and external motivations for changes of orthography, phonology, grammar and meanings.

- Studies on Korean Dialectology (3)

In this course, we will examine regional dialects of Korea about their linguistic characteristics including phonology, grammar, and vocabulary. On the basis of the Korean dialect distribution and of the geolinguistic and sociolinguistic understanding, we will discuss how understanding of dialects enriches Korean linguistic studies, which have been mostly focused on standard language, and shows social change progresses.

- Studies on History of Korean Grammar I (3)

In this course, we will examine changes of Korean grammatical elements, word formations, syntactic structures and sentence rules from Ancient Korean to Modern Korean. On the ground of the synchronic studies on the essential periods, we also focus on the explanation of the diachronic changes and seek to find the relationship to the Modern Korean.

- Studies on Standard Korean Grammar (3)

In this course, we will review linguistic standards such as school grammar, standard language, and orthography. Students are expected to learn essential knowledge and develop their abilities for teaching Korean grammar.

- Korean Lexicology and Lexicography (3)

In this course, we will explore lexical structures, meanings and uses based on lexicology, lexico-semantics and lexicography. Then, we will examine how Korean dictionaries are being used, and seek to find ideal ways to compile Korean dictionaries.

- Studies on Korean Language use and Policy (3)

The aim of this course is to establish theoretical bases for language policy and examine a range of linguistic, educational, social and political issues which are involved in the area of language policy and planning.

- **Corpus Linguistics (3)**

The purpose of this course is to study on corpus linguistics: its theoretical backgrounds, research methods and relationship with general linguistics. Students will examine how to utilize corpus for actual research projects.

- **Studies on Modern and Contemporary Korean Language Texts (3)**

The purpose of this course is to examine various Korean texts from the period of late 19th to early 20th century, which include the time period of enlightenment, Korean Empire, Japanese colonial period, after liberation period and Korean war. The texts include data from newspapers, magazines, textbooks, broadcast, literary journals, academic journals, public and private documents, and oral data (including dialect data). Students will analyze the data from various perspectives such as Korean Linguistics, Teaching Korean as a National Language, Teaching Korean as a Foreign Language, general language education and language policy to understand general appearance of the Korean language use in modern and contemporary Korean.

- **Research Ethics & Thesis Study (3)**

The purpose of this course is to examine general procedures of writing academic thesis, and review research ethics and methodologies.

- Studies on Korean Grammar II (3)

The purpose of this course is to newly examine morphology, syntax, and grammar of Korean language through various methodologies of such theories as structuralism, transformational generative grammar, formalism, functionalism, discourse analysis, and cognitive grammar. Considering linguistic characteristics of Korean, we will seek to find a grammar that can explain various phenomena of Korean language effectively.

- Studies on Korean PhonologyII (3)



On the ground of traditional and modern phonological theories, we will look for methodologies for explaining Korean phonological system and structural changes of phonologic combination. Further, we will practice analyzing data to find out various phonological features.

- Studies on Korean MorphologyII (3)

In this course, we will examine morpheme combinational changes and functions, and explore processes and patterns of word formation from the points of views of structuralism, and generative grammar. We will further expand and deepen our discussions in relations with morphophonemics, lexical semantics, and considering historical changes.

- Studies on Korean SyntaxII (3)

In this course, we will take new perspectives on syntactic structure and phenomena of Korean language through various methodologies of such theories as transformational generative grammar, and functionalism. Considering unique characteristics of Korean language, we will seek to find new ways to describe Korean syntax in a more practical way.

- Studies on Korean SemanticsII (3)

In this course, we will discuss meanings of Korean words, sentences, and utterances considering both diachronic changes and synchronic system through the methodologies of lexical-semantics, syntactic-formal semantics, pragmatics, discourse-text linguistics, and cognitive semantics.

- Studies on Historical Phonology in KoreanII(3)

In this course, we will first review general theories on phonological changes. Then, we will explore phonological characteristics of each period by discussing phonological system, structure of phoneme, phonological combination and phonological phenomena. Further, we will learn methodologies for analyzing phonological changes and characteristics.

- Korean Pragmatics and Discourse/Text AnalysisII(3)

In this course, we will examine Korean discourse and text linguistics in terms of types, structures, elements, and functions of texts. We will discuss how to describe and explain Korean discourse systematically in detail.

- Studies on History of Korean LinguisticsII(3)

In this course, we will review tradition of Korean linguistic study in terms of its objectives, contents, subjects of study, and characteristics of methodologies. The discussion will be focused on views on writing system, methodologies of Korean

linguistic studies, and adaptation of foreign theories which are realized in *Hunminjeongeum*.

- Studies on History of the Korean LanguageⅡ(3)

In this course, we will first review general theories on linguistic changes, and then explore internal and external motivations for changes of orthography, phonology, grammar and meanings.

- Studies on History of Korean GrammarⅡ(3)

In this course, we will examine changes of Korean grammatical elements, word formations, syntactic structures and sentence rules from Ancient Korean to Modern Korean. On the ground of the synchronic studies on the essential periods, we also focus on the explanation of the diachronic changes and seek to find the relationship to the Modern Korean.

- Data Analysis Research for Teaching Korean as a Foreign Language (3) (추가)

The purpose of this course is to thoroughly examine how to choose research topics and methods, and how to collect and analyze data for researching on teaching Korean as a foreign language. This course will help students with setting up a foundation for conducting reliable researches.

- Studies on Modern Korean Poetry (3)

In this course, we will explore characteristics of modern Korean poetry. Specifically, we will synthetically examine representative works considering their contents, styles, structures expressions and techniques.

- Studies on Modern Korean Novels (3)

In this course, we will examine characteristics in Korean modern novels. First, we will review main issues on characteristics of Korean modern novels. Then, we will explore traditional and western features appearing in them.

- Studies on Classical Korean Poetry(3)

To understand characteristics of Korean classical poetry, we examine *hyangga*, *Goryeo-gayo* (Goryeo poetry), *akjang*, *sijo* and *gasa* from various viewpoints, while exploring methodologies to analyze them.

- Studies on Classical Korean Novels (3)

The aim of this course is to understand the characteristics of Korean classical novels in terms of their subject, content, conflicts and types considering social and cultural backgrounds.

- Studies on Modern Korean Play (3)

For understanding the Korean drama wholly through studying its synthetic feature ,we synthetically study the representative writer, the subject, the technique of the works, the relation of europeandrama and so on.

- Studies on Modern Korean Poets (3)

In this course, we will read poems of representative poets in the history of modern Korean poetry. We will further explore the characteristics and changing trends of the words according to the period of time.

- Studies on Modern Korean Writers (3)

In this course, we will explore characteristics of important writers in the history of Korean novel. First, we will review characteristics of each writer, and then we will read, analyze, and compare representative works of them.

- Studies on Classical Korean Writers (3)

In this course, we will review novels, poetry and general proses in classical Korean literature, which could be a foundation for a scientific approach to Korean classical literature. For this purpose, we will deal with writers' bibliographic backgrounds as well as their ideologies and views on literature.

- Studies on Methodology in Classical Korean Literature (3)

In this course, students will explore methodologies for understanding Korean classical literature. We first review general methodologies for analyzing literature in general, and then focus on the methodologies for Korean classical literature.

- Studies on Classical Korean Criticism(3)

In this course, we will attempt to newly illuminate the status of criticism in the classical Korean literature and review literary criticism from late Goryeo to late Joseon period. Through this, we will be able to grasp Korean literature from a historical viewpoint.

- Studies on Modern Korean Poetry History (3)

In this course, we will examine poems of representative poets in modern Korean poetry history. The examination will focus on the poets' views on their lives, their mental structures and poetic characteristics of their works.

- Studies on History of Modern Korean Novel (3)

The goal of this course is to understand the history of modern Korean novels. We will discuss on important writers and analyze their works during the enlightenment period to the present.

- Special Studies on Modern Korean Novel (3)

The goal of this course is to examine the main texts and writers of modern Korean novels by referring to the newly produced research results and using new methodology.

- Studies on Modern Korean Literary Criticism (3)

The Studies on Modern Korean Literary Criticism is a critical feature fundamentally. So the technique for the critical accessing to the modern literature is important both for the studies and for the practical purpose as one majored in the modern literature. we newly explain the important writings of the modern critics and practice the actual critical-work about the writers and the works in the History of the Modern Korean Literature.

- Studies on Sino-Korean Literature (3)

In this course, we will examine unique relationship between Korean and Chinese literatures. We will explore literary styles in the Sino-Korean literature. Further, we will attempt to establish unique position of Sino-Korean literature between Korean and Chinese literatures.

- Studies on Korean Oral Literature (3)

In this course, we will examine characteristics of Korean oral literature which includes folk tales, folk songs, narrative shamanic songs, *pansori*, and folk festivals. The examination will focus on styles of oral literature, ways of translation, and relationships between genre and social class.

- Studies on History of Modern Korean Literary Criticism (3)

Th Studies on History of Modern Korean Literary Criticism is a critical feature fundamentally. So the technique for the critical accessing to the modern literature is important both for the studies and for the practical purpose as one majored in the modern literature. we newly explain the important writings of the modern critics and practice the actual critical-work about the writers and the works in the History of the Modern Korean Literature.

- Studies on Comparative Literature (3)

In this course, we will examine Korean literature from a viewpoint of comparative literature. We will first review theories of comparative literature, and then explore Korean literature comparing with foreign literature.

- Studies on History of Modern Korean Drama (3)

We study the historical flow of the Korean Drama from the Ancient Korean Drama to the Modern Korean Drama. For this studies we study the advance-ment of the History of Korean Drama and we discuss ways and means and we study the aspect of the Korean Folk Drama.

- Comparative Studies on Modern Literature of East Asia (3)

In this course, we will explore characteristics of Korean literature in the settings of East Asian literature. East Asian countries experienced similar history in the modern era; therefore Modern Korean literature is closely linked with the literatures of East Asian countries of that time. In this course, students examine how the clash of the culture and history created the Modern Korean literature.

- Studies on Literature in Modern Enlightenment Era (3)

In this course, we will investigate the nature and characters of the Modern Korean literature based on the analysis of the literary works. The investigation will focus on establishing the status of Korean literature in modern enlightenment era in the history of Korean literature.

- Special Studies on Modern Korean Poetry (3)

In this course, we will examine essence and characteristics of modern Korean poetry by analyzing representative works. We will analyze and evaluate important works that characterize each period and discuss on unique features of modern Korean poetry.

- Korean Literature and Diaspora (3)

The goal of this course is to examine various aspects of Korean literature from the viewpoint of diaspora beyond the borders of national literature.

- Special Studies on Hyangga-Koryogayo (3)

For studying the feature of form and substance, the name, the origin, the class-enjoyment and the historical development about Hyangga and Koryogayo, we consider the new methodology on the ground of studying the existing history of studies on that.

- Special Studies on Gasa-Sijo (3)

In this course, we will seek to find new methodologies for understanding *gasa* and *sijo* on the ground of existing studies. We will explore features of form and substance, as well as titles, origins, social class of enjoyment and historical development about *gasa* and *sijo*.

- Special Studies on Korean Novel Written by Korean (3)

In this course, we will examine classical Korean novels written in Korean. Specifically, we will examine their topics, types and special features. The examination will be including studies on bibliography, annotations, sociology, and comparative literature, on the foundation of essential literary studies.

- Teaching Methodology on Modern Korean Literature (3)

In this course, we will examine major works of Korean modern literature, and seek to find methods for teaching modern literary works in a profound and effective way. On the bases of understanding of Korean modern literary works, we will grasp the practical methods and the meaning of 'teaching modern Korean literature'.

- Special Studies on Korean Novel Written by Chinese (3)

In this course, we will examine classical Korean literature written in Chinese. Specifically, we will examine their topics, types, and special features. The examination will be including studies on bibliography, annotations, sociology, and comparative literature, on the foundation of essential literary studies.

- Special Studies on Poem Written by Chinese (3)

In this course, we will examine themes of poetry written in Chinese and analyze them through understanding the original texts.

- Special Lectures on Methodology of Modern Literature (3)

In this course, we will discuss how Korean literature should be studied. First, we will review methodologies for analyzing literature and discuss on new methodology for solving the problems in the existing methodologies.

- Special Studies on Korean Narrative Literature (3)

The aim of this course is to investigate the topics and consciousness of Korean narrative literature. The investigation includes classifying the narrative literature by types and motifs.

- Special Lectures on Classical Korean Narrative (3)

The study on classical Korean Narrative is a base and nutrition for the study of Korean language and literature. The aim of this course is to offer interdisciplinary approach to the classical Korean narrative across linguistics and literature studies, as well as classical literature and contemporary literature.

- Readings of Classical Korean Narrative (3)

Fluent reading abilities for the original texts are essential for the study of classical Korean narrative. Therefore, students are to improve students reading ability for the original classical Korean Narrative. During the course students will be asked to read most of the essential classical Korean Narrative.

- Special Lectures on Classical Korean Poetry (3)

Poetry was major and dominant literary genre in the history of Korean literature from ancient time to Joseon dynasty. In this course, we will develop abilities to analyze classical Korean poetry creatively.

- Readings of Classical Korean Poetry (3)

In this course, we will read classical Korean poetry and investigate characteristics of the poetry by periods. We will first review previous studies, and learn diverse methodologies for text based research skills.

- Special Lectures on Literature Written in Chinese (3)

Korean literature written in Chinese is precious heritage in Korean literature. The aim of this course is to understand and reexamine the values of the Korean literature written in Chinese in the contemporary context. We will also investigate various methodologies by author, theme and genre.

- Readings of Literature Written in Chinese (3)

The purpose of this course is to develop reading comprehension abilities for Korean literature written in Chinese. In this course, students will read a selection of poetry, prose fiction written in Chinese. Students are expected to read most of the basic texts.

- Studies on Placeness of Modern Korean Literature (3)

In this course, we will examine relationship between places where literary works were created and literary texts from the perspective of imaginative place or space. We will also consider the meanings of places in the point of cultural studies.

- Studies on Translation and Literature of Korea (3)

In this course, we will examine relationship between modern literature and translation. Specifically, we will explore influences of translations of foreign literature to Korean literature during enlightenment period to the end of Japanese colonial period from the view of translation theory and post-colonialism.

- **□ Teaching Korean As a Foreign Language Major**

- Studies on Teaching Expressive Skills in Korean: Speaking & Writing (3)

The purpose of this course is to examine characteristics and types of skills for speaking and writing, and to discuss on actual teaching plans focusing on fluency and accuracy.

- Studies on Foreign/second Language Acquisition (3)

The purpose of this course is to examine major theories and principles in foreign language acquisition, and analyze various aspects of language development, especially focusing on psychological and environmental factors as well as learner strategies.

- **Korean Pragmatics & Discourse/Text Analysis (3)**

This course will focus on seeking accurate and appropriate ways for describing and explaining types, structures, elements,

and functions of various kinds of Korean discourses and texts, considering methodologies and themes of pragmatics and discourse linguistics.

- **Studies on Korean Grammar (3)**

The purpose of this course is to examine various meaning phenomena in Korean morphology, syntax and grammar. The examination will be conducted from the perspectives of various theories such as structure theory, transformational generative grammar, formalism, discourse theory, and cognitive theory.

- **Studies on Linguistic Typology (3)**

The purpose of this course is to examine characteristics of the Korean language from the perspective of linguistic typology, which examines typical characteristics of the languages of the world. Students will discuss how to consider these characteristics when educating Korean language.

- **Studies on Contrastive Linguistics (3)**

The purpose of this study is to review methodologies of comparing languages, and apply them to compare Korean with other languages in terms of their linguistic differences. Students will examine effective ways to educate Korean as a foreign language learners by their native languages.

- **Studies on Teaching Comprehensive Skills in Korean: Listening & Reading (3)**

The purpose of this course is to examine theories on listening and reading in second language acquisition, and to seek for effective ways of teaching Korean as a second language learners listening and reading.

- **Studies on Teaching Korean Pronunciation (3)**

The purpose of this course is to seek for effective ways of teaching standard pronunciation of Korean, as well as pronunciation in reality, based on the understanding of Korean phonetics and phonology.

- **Studies on Teaching Korean Vocabulary (3)**

The purpose of this study is to examine effective ways of nurturing ability for foreign learners to learn words and make use of them based on their understanding of the meanings and usages of Korean vocabulary.

- **Studies on Teaching Korean Pedagogical Grammar (3)**

The purpose of this course is to seek for contents and methods for grammar education for Korean as a second language students to develop their ability for learning grammar and make use of it.

- **Studies on Curriculum Design in Teaching Korean (3)**



The purpose of this course is to examine theories on second language education and seek to develop reasonable curriculum considering such variables as purpose of education, environment, and learner.

- Studies on Assessment & Testing of Korean as a Foreign Language (3) (추가)

The purpose of this course is to review theories on foreign language testing and assessment, and to seek for effective ways to assess Korean ability.

- Studies on Teaching Korean Culture (3)

The purpose of this course is to examine theories of educating culture, and to seek for developing plans for educating Korean culture and society.

- Practicum in Korean Language Classrooms (3)

In this course, students will experience teaching and learning in actual Korean classes, and seek for reasonable plans for educating Korean language by preparing for teaching plans considering students' proficiency and the objectives of the class.

- **Studies on Modern Korean Literature(3)**

The purpose of this course is to examine methods for educating major works of modern Korean literature, which includes poetry, novel, and drama. Based on the understanding of the literary works, students will understand how to educate literature and the meaning of educating literature.

## □ Faculty Members

### **Kim, Heung Soo**

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## Dept. of English Language and Literature

The Department of English Language and Literature offers a professional, yet congenial environment in which pursue the study and teaching of English in all the principal areas from the medieval period to the twenty-first century. Our diverse faculty boasts nationally and internationally known scholars in English and American literature, linguistics and literary theories. We welcome your interest and invite you to explore all that English encompasses at the department of English Language and Literature.

### ☐ English Language Major

English Language Major specializes in a wide variety of subjects, including English syntax, English semantics, English phonology, English morphology, English linguistics and its application, and linguistic history, etc.

### ☐ English Literature Major

English Literature Major specializes in a wide variety of subjects, including critical theories, cultural studies and literary history. We also offer a broad range of courses in Medieval, Renaissance, Eighteenth Century, Romantic, Victorian, American and Postcolonial Literature and Culture.

### ☐ Courses

#### ☐ Core Courses

##### • **English Grammar and its Application (3)**

This course aims to enhance the understanding of the English grammar through a diachronic and synchronic analysis concerning the theories of the English grammar.

##### • **Researches in British and American Literature (3)**

This course is designed to develop the general comprehension of the British and American literature through research of the literary works.

##### • **Research Ethics & Thesis Study**

Graduate students will develop an appropriate understanding of the nature of ethical decision-making in conducting research and writing academic papers. They will also improve their general understanding about writing a thesis or dissertation by discussing research topic selection, research methodology and writing procedures.

### ☐ English Language Major

##### • **Analysis of Sentence Structure (3)**

This is an introductory syntax course for beginning graduate students. Both the

earlier version and the later development of the Principles and Parameters theory, one of the major approaches to syntax, will be introduced. Throughout the course, primary emphasis will be placed upon the syntactic properties of the English language.

- **English Semantics (3)**

First, seven types of meaning are discussed. Then, componential analysis is discussed. And the relationship between syntax and semantics is discussed. Finally, presuppositions and factuality are discussed.

- **English Sounds Heard and Unheard (3)**

Phonology is the study of sound systems of a language. It investigates how speech sounds are used systematically to convey meaning in different languages. The sounds used to make a difference in meaning are the phonemes, the basic concept of phonology. With the inventory of the phoneme of English, basic principles of phonology will be introduced to prepare students to analyze various phonological patterns of English.

- **Studies in English Morphology (3)**

First, the students practice analyzing words into morphemes. Then, the way in which words are derived or created is discussed. And the relationship between syntax and morphology is discussed.

- **Studies in Discourse Analysis (3)**

This course is designed to study Discourse Analysis (DA) theories systematically grounded on pragmatics. First, Grice's Cooperative Principle and Maxims of Conversation are discussed. Maxims of Conversation are Maxim of Quantity, Maxim of Quality, Maxim of Relation, and Maxim of Manner. Then, discourse analysis is discussed. Furthermore, the students practice analyzing actual discourses.

- **Studies in Applied Linguistics (3)**

The ultimate goals of this course are to understand human nature and to study how the language can influence the human by reflecting the relationship between language and internal, outer environments of the human being based on the perspectives of sociolinguistics and psycholinguistics.

- **Seminar in English Linguistics (3)**

Designated topics in current English linguistics will be discussed, placing emphasis on the recent development of the Minimalist Program. Particular attention will be paid on pursuing new analyses of the linguistic data which have been central topics in linguistic researches in the last few decades.

- **Language Acquisition (3)**

This course aims to study the process of children's language learning and their language system by examining their process of the first language acquisition. This also will help to understand language system of adults and provide important data of second language learning.

- **English Linguistics and its Application (3)**

This course is designed to research how English linguistic theories and the methods of studying them can contribute to neighbor studies (literature, psychology, sociology, etc), especially how to help the literary investigation.

- **Linguistic Theories (3)**

The theoretical frameworks and research methods of linguistic theories will be compared. The strengths and weaknesses of the theories will also be investigated and discussed. Specific constructions and data will be analysed to test the explanatory power of each theory.

- **Studies in Linguistic Typology (3)**

First, definitions and scope of typology are discussed. Then, typological classification is discussed. And implicational universals and markedness in typology are discussed. Fourthly, prototypes and the interaction of typological patterns are discussed. Finally, the typology of form?function relations is discussed.

- **Advanced English Syntax (3)**

This is a seminar course for advanced students in English syntax. The course will begin with a brief survey of the Principles and Parameters theory. At the end of the semester, the students are expected to understand what the aim of a syntactic theory is, identify the general syntactic properties of English, have intensive understanding on the principles in syntactic theories and their parameters, and be familiar with the recent development of the Minimalist Program.

- **Advance English Phonology (3)**

This course sets out from the key concepts for the area of study providing examples of language data and building on the key ideas already introduced through the undergraduate courses. It also offers students the chance to compare their expertise with key readings in the area taken from the work of important writers and provided with guidance and questions for their further thought. This course concentrates particularly on practical rather than theoretical aspects of phonetics and phonology.

- **Independent Study(English Language) (3)**

Through a one-to-one mentoring system with professors, students will choose from an array of available optional courses according to their specialization and carry out self-directed learning.

- English Literature Major

- **Seminars in British and American Literature Researches (3)**

There may be a variety of ways of conducting researches of the British and American authors and their works, but in this course a major emphasis is laid on the basics with a view to preparing the students for further studies and researchers abroad in English-speaking countries. The students, therefore, will be asked to read quite a number of excerpts or works in all major literary genres of the British and American literature, both past and present.

- **Academic English Writing (3)**

You cannot emphasize enough the importance of English writing in academic researches, but in reality there are few courses where students are offered the chances of writing academic articles in English. This course is particularly dedicated to improving students' writing skills with actual practices of writing essays in English on a wide range of subjects taken from various fields of Humanities.

- **Studies in 19th Century British and American Poetry (3)**

This course is in the first place about the diverse but interrelated literary movements in the 19th century Great Britain, that is, Romanticism, the early and the high Victorian literature, the fin-de-siecle and the Georgian poetry. At the same time, it also pays due attention to their trans-Atlantic influence on the nascent American literature, especially within the genre of poetry.

- **Studies in 19th Century British Fiction (3)**

This is a discussion based course focusing on major novels of the nineteenth century, trying to trace historical and social contexts of individual works. The novels to be read will include the following: *Ivanhoe*, *Emma*, *Little Dorrit*, *Vanity Fair*, *Middlemarch*, *Jude the Obscure*, *Jane Eyre*, *Wuthering Heights*, etc.

- **Studies in American Fiction (3)**

This course offers critical approaches to representative American novels and short stories. Main texts will be chosen from the works of Cooper, Hawthorne, Melville, Twain, Howells, James, Crane, Norris, London, Cather, Anderson, Dreiser, Lewis, Fitzgerald, Hemingway, Woolf, Faulkner, Farrell, Steinbeck, Warren, Mailer, Salinger, Styron, Ellison, Bellow and other writers.

- **Studies in Modern British and American Drama (3)**

While reading representative works by twentieth century major British and American dramatists, the course will help deepen the students' critical understanding of the modern British and American dramas. The dramatists covered in the course will include Bernard Shaw, W. B. Yeats, J. M. Synge, Sean O'Casey, T. S. Eliot, Noel Coward, Samuel Beckett, Harold Pinter (British and Irish) and Eugene O'Neill, Tennessee Williams, Miller, Albee(American).

- **Studies in Modern & Contemporary British and American Poetry (3)**

This course is aimed to review the works of poetry in general within modernism and postmodernism of the twentieth century and thereafter.

- **English Renaissance Drama (3)**

The English drama was at its highest in the Renaissance England not just nationally but by any international standard. At the center of the dazzling development was no doubt Shakespeare, but there were several other playwrights such as Christopher Marlowe, John Webster etc. who even now draw our full attention. In this course students will be given the opportunities of studying the period and the drama works of English Renaissance, including those of Shakespeare.

- **Studies in British Literary Periods (3)**

This course offers an opportunity to study a variety of texts from different literary genres which were produced during a specific period. It will focus on the historical, social, ideological contexts reflected or represented in those texts.

- **Studies in Modern British Fiction (3)**

We will read some of the major modern or postmodern British novels since 1900, starting from the works by Conrad, Woolf, Lawrence, or Joyce. We will be mainly concerned with the ways the modern or postmodern novels respond to their cultural contexts.

- **Studies in American Literature and Culture (3)**

This course focuses on cultural topics in American literature, dealing with American literary texts essential for understanding American culture.

- **Studies in 18th Century British Fiction (3)**

This course will concentrate on the major works of English novelists before 1800, such as Robinson Crusoe, Moll Flanders, Pamela, Joseph Andrews, Clarissa, Tom Jones, Humphrey Clinker, and Tristram Shandy. Our interest will be in the development of English novel form, in literary reflections of social contexts, and in

the artistic achievement of individual novels.

- **Studies in British and American Literary Criticism (3)**

The course will cover British and American literary criticism from Philip Sidney through Dryden, Pope, Coleridge, Arnold and Eliot to The New Criticism and Structuralism, major critical trends and theories in the early and middle to late twentieth century, respectively. Hopefully, the students will be made aware of the historical development of British and American literary criticism, on the one hand, and the major critical and theoretical points, on the other.

- **British and American Drama Theories (3)**

As drama classes are usually conducted in terms of drama works, the opportunities are rare for students to come in contact with drama theories. Considering the situation, this course aims to teach various drama theories in terms of period and genre.

- **Studies in British Authors (3)**

This course is the Study of major British writers from the early 18th Century to the present. This seminar will select some representative British writers and explore their aesthetic world focusing on his major works.

- **Studies in American Authors (3)**

This course deals with representative American writers, focusing on the artistic and cultural property of each writer.

- **Studies in Postmodernism (3)**

This course is aimed to study deeply post-modern phenomena in its diversified field.

- **Seminar in History of English Literature (3)**

In this course, we will survey English literature from Chaucer's age through the late twentieth century, focusing on the major English writers of poetry, fiction, and drama. Attention will be equally given to historical and ideological trends and individual styles and sensibilities.

- **Seminar in History of American Literature (3)**

In this course, we will survey American literature from the colonial era to the present, focusing on the major American writers of poetry, fiction, and drama. Attention will be equally given to historical and ideological trends and individual styles and sensibilities.



- **Seminar in Translation (3)**

This course is designed to give students some practical opportunities to learn the theoretical knowledge of literary translation and to acquire the basic arts and skills of literary translation. A couple of theoretical texts will be read and discussed, and then samples of literary translation, such as short stories, poems, or dramas, will be critically examined. Students will be required to translate a short story.

- **Topics in English Literature (3)**

An investigation of the major concerns, paradigms, and quarrels within postcolonial literary studies. This course will help the students explore the idea of classic works in the postcolonial, global era.

- **Topics in American Literature (3)**

This course deals with significant topics in American literature, focusing on the cultural themes of the American literature.

- **Topics in British & American poetry (3)**

This course will concentrate on the selected English and American poets.

- **Topics in English Fiction (3)**

In this course we will do a critical approach to the world of English Fiction, focusing on one or two special topics. Our discussion topics may be selected from various topics such as gender, class, environment, etc.

- **Topics in British and American Criticism (3)**

This course is aimed to study theories and practices of Western criticism in a wide perspective.

- **Independent Study(English Literature) (3)**

Through a one-to-one mentoring system with professors, students will choose from an array of available optional courses according to their specialization and carry out self-directed learning.

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## Dept. of Chinese Language & Literature

The Chinese Literature course is notable in that all of the Departmental academic staff have specialized in areas of Classical Chinese Literature and therefore offer creative and in-depth focus on various aspects Classical Chinese Literature. The department has been already established with Korean Literature in Classical Chinese 30 years ago which is one and only case among the graduate courses of Chinese Language and Literature in Korea.

The Department aims to train its students into specialists in their respective areas based on sound basic knowledge of Literature, History and Philosophy combined with data analysis, research methods and theory understanding. Students will reach academic standards which allow them to form creative original research and literary criticisms and thus contribute to the development of Chinese Language and Literature studies. The knowledge gained from these courses will also allow students to form comparative studies with other literary works of art such as Korean Classical Literature.

### ☐ Chinese Language Major

### ☐ Chinese Literature Major

The Department of Chinese Language & Literature offers courses in specialty areas of Chinese Language and Chinese Literature. The course of Chinese Language is further subdivided into Phonology, Writing, Chinese Phraseology etc, while Chinese Literature is further subdivided into Classical Poetry, Classical Literary Criticisms, Classical Prose and Classical Novels. The Chinese Literature course is notable in that all of the Departmental academic staff have specialized in areas of Classical Chinese Literature and therefore offers creative and in-depth focus on various aspects Classical Chinese Literature.

### ☐ Courses

#### ☐ Core Courses

- **Studies on Chinese Theories of Linguistics (3)**

This course aims for students to enjoy a comprehensive study of theories of linguistics. For each semester a different topic will be explored.

- **The History of Chinese Language (3)**

The study of Chinese language development and evolution from the spread of the common language through to the Cultural Revolution.

- **Studies on Chinese Dialect (3)**

The course aims for students to gain a systematic understanding of Chinese Dialect

- **Studies on Rhythm in Chinese Poetry (3)**

The course aims for students to gain a systematic understanding of various Chinese Rhythm by reading and analysing a number of texts.

- **Chinese Semantics (3)**

The course aims to explore semantics, as one of the sub-fields of linguistics. Students are expected to pay attention to semantics that are prone to be overlooked through a systematic study of works and theses.

- **Chinese Pragmatics (3)**

The course aims at a systematic understanding of Chinese Pragmatic Theory through the main subjects and problems. Main issues differ each semester, and students will be informed in advance.

- **Comparative Phonology in Korean and Chinese (3)**

The course aims to studies on comparative phonological theories between Korea & China.

- **Chinese Syntax (3)**

This course will study various topics in Chinese Syntax.

- **Studies on Chinese Oracle-Bone Characters (3)**

Examination of the meaning and historical value of Oracle Bone Character

□ Chinese Language Major

- **Studies on Chinese Characters (3)**

The course aims to familiarize students into the historical background and principles of Chinese character formation and changes of form through history in order to gain knowledge of the original shape, meaning and pronunciation of Chinese characters.

- **Studies of Comparative Linguistics I (3)**

Comparative linguistic studies of Chinese character pronunciation in China, Korea and Japan.

- **Studies of Comparative Linguistics II (3)**

Comparative linguistic studies of Chinese character pronunciation in China, Korea and Japan.

- **Studies on Shuo-Wen (3)**

Provides an overview of the book Shuo-Wen.

- **Studies on Ancient Chinese Grammar (3)**

Analysis of changes within Chinese expression and language structure throughout

the ages, from ancient to modern periods.

- **Studies on Chinese Phonology (3)**

Research into Chinese Phonology and comparisons of different dialects in the modern Chinese language.

- **Studies on Modern Chinese Grammar I (3)**

The course aims to study on Modern Chinese Grammar.

- **Studies on Modern Chinese Grammar II (3)**

The course aims to depth study on Modern Chinese Grammar.

- **Studies on Chinese Formal Characters (3)**

Studies on the function and linguistic characteristics of Chinese Formal Characters within Chinese compositions and widen understanding about its uses and applications.

- **Studies on Shijing and chuci I (3)**

Shijing is the representative verse of northern Chinese Literature and likewise Chu Poetry represents the verse of southern Chinese literature.

- **Studies on Shijing and chuci II (3)**

Shijing is the representative verse of northern Chinese Literature and likewise Chu Poetry represents the verse of southern Chinese literature.

- **Intellectual History of China (3)**

Research into the evolution of Chinese intellect throughout history.

- **Studies on Ci & Qu (3)**

The study of origin, form and development in the works of Ci, representative of Song-period literature, and Qu, representative of Yuan-period literature.

- **Seminar on Comparative Literature Between Korea & China (3)**

These seminars compare and analyse the literary works produced by the two countries in order to help determine their distinguishing characteristics.

□ **Chinese Literature Major**

- **Studies on Chinese Poetry (3)**

The course evaluates the evolution, character and forms of Chinese poetry throughout the ages in order to promote understanding and insight of Chinese poetry from different periods.

- **Studies on the Theory of Chinese Poetry (3)**

This course aims for students to study various issues of Chinese poetry and poetics. In each semester, a different topic will be explored

- **Theory of Chinese Literature (3)**

In this course we will explore controversial subjects from Chinese literature to help establish a more comprehensive and systematic understanding of the history of Chinese literature.

- **Studies on Confucian Classics I (3)**

The aim of the course is to promote insightful understanding of 13 Confucian classics and also extensively study the system of Classical Chinese ideology.

- **Studies on Confucian Classics II (3)**

The aim of the course is to promote insightful understanding of 13 Confucian classics and also extensively study the system of Classical Chinese ideology.

- **Studies on Poetry in the Tang Dynasty (3)**

In depth study of Tang Dynasty poetry, representative of classical Chinese poetry, along with its forms and compositional rules.

- **Studies on Ancient Chinese Philosophers and Scholars I (3)**

Research into the philosophical system, theories and influences of Pre-Chin Period scholars, along with studies into the role played by Chinese Prose Literary Thought.

- **Studies on Ancient Chinese Philosophers and Scholars II (3)**

Research into the philosophical system, theories and influences of Pre-Chin Period scholars, along with studies into the role played by Chinese Prose Literary Thought.

- **Chinese Literary Criticism (3)**

Through theory and critical evaluation, the course aims to widen understanding of Chinese literary works as well as to evaluate their importance.

- **Studies on Chinese Literary Thought (3)**

Research into Chinese literary thoughts and ideas from ancient to modern times.

- **Studies on Chinese Prose (3)**

The study of Chinese Prose from different periods and the analyses of their content, style and ideas in order to understand the important role that Chinese Prose have played in literature.

- **Studies on Chinese Novels (3)**

The evolution of Chinese novels and the characteristics of different types of novels from period, and the importance of novels in Chinese literary thought.

- **Studies on Modern Chinese Writers (3)**

The course aims to understand the ideas and historical backgrounds that have influenced the lives and works of notable contemporary Chinese writers.

· **Studies on Modern Chinese Literature (3)**

Studies of notable Chinese writers and their works from the Cultural Revolution and later periods.

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## Dept. of Korean History

Department of Korean History has been training experts who will engage in the study of Korean History. We let students learn how to read and write thesis and methods of researching, common logics from basic training. Furthermore, we make them to work as an expert or a specialist in every field of History. Therefore we have established master's course, doctor's course and master & doctor Integration process. The major was separated into Korea History I (The age of ancient ~ Goryeo), Korea History II(Joseon ~ The present age).

### ☐ Korean History(I) Major

It's our goal to breed competent historians through exact historical recognition and practical scholarly research major in historical space from origin to Goryeo area.

### ☐ Korean History(II) Major

It's our goal to breed competent historians through exact historical recognition and practical scholarly research major in historical space from the early Joseon Dynasty to the present.

### ☐ Courses

#### ☐ Core Courses

- **Studies in Ancient History of Korea (3)**

Considering History from ancient times to the end of Sillas with politics, economic, society and culture as the central historical materials.

- **Studies in Medieval History of Korea (3)**

Considering History of Goryeo Period with politics, economic and society.

- **Studies in Pre-Modern History of Korea 1 (3)**

Considering History of early Joseon period(1392~1592) with politics, economic, society and culture.

- **Studies in Pre-Modern History of Korea 2 (3)**

Considering History of late Joseon period(1592~1876) with politics, economic, society and culture.

- **Studies in Modern history of korea (3)**

Considering from 1860 to the 1945, semi-feudalism, reformation campaign and the



process of imperialistic-invasion, etc will study the problems in modern history Research.

- **Studies in Contemporary Korean History (3)**

Considering from 1945 to the 1980s, Korean War, dissolution of Colonial economic system, Capitalism, Saemaeul Movement and international political etc, will study the Problems of Contemporary History Research.

- **Studies in Modern History of Korea Historiography (3)**

Considering social system from ancient times to modern times as the central historical development in process.

- **Studies in the Political and Diplomatic History of Korea (3)**

Considering correlating government and diplomacy mutually in Korean history.

- **Theories and Methods in Archaeology (3)**

Acquired to fundamental knowledge of archeology and put a theory in practice through methodology.

- **Theories and Methods in Ethnology (3)**

Acquired to fundamental knowledge of ethnology and put a theory in practice in analysis material.

- **Studies in Archives Management of History (3)**

Acquired to fundamental knowledge of archives management of history.

- **Studies in Cultural Contents of History (3)**

Acquired to fundamental knowledge of cultural contents of history.

- **Studies in the Social History of Korea (3)**

Considering the social system of Korea from ancient times to modern times laying stress on a process of development.

- **Research Ethics & Thesis Study (3)**

This lecture is on research ethics in writing paper.

- **Studies in the Intellectual History of Korean Confucianism (3)**

Considering unfolding process of Korean Confucian thoughts in situation of thought.

- **Studies in the History of Korean Independence Movement (3)**

Considering anti-Japan independence movement concentrically to release in 1945.

- **Seminar on Modern and Contemporary Western History (3)**

Review the main flow of the history of western civilization from the age of imperialism until the end of the Cold War, the dissolution of the Soviet Union in 1991.

- **Seminar on the History of Western Historiography (3)**

Identify the main flow on the western modern history through a multifaceted understanding of modern and contemporary Western society.

- **Comparative Studies in East Asian History (3)**

This lecture's main purpose is to understand Korean history by way comparative approaches.

- **Studies in History of Sino-Korean Relationships (3)**

This lecture's main purpose is to explore the historical relations between Korea and China, which has the deepest relationships with Korea.

□ Korean History(I) Major

- **Studies in Formation of the Korea State (3)**

Considering historical development in process from Ancient society to country as the theory and historical materials.

- **Studies in Social History of the Three Kingdoms (3)**

Considering history of the three Kingdoms with social position system, social system, politics system.

- **Studies in the History of North and South Period (3)**

Considering history from samguk t'ong'il to the end of Parhae with politics, economic, society and culture as the central historical materials.

- **Studies in the late Silla Dynasty (3)**

Considering since Wonsung-wang to after period of the three Kingdoms as the powerful family's activities.

- **Studies in Aristocratic Society of Koryo Dynasty (3)**

Consider the vassal's political activities of Goryeo complicated international relation laying focus on Liao, Jin, Yuan.

- **Studies in History of Korea Buddhism (3)**

Considering the process transmission of Buddhism as the side cultural political.

- **Studies in Political History of Goryeo Dynasty (3)**

Considering Goryeo's political history as the central military administration.

- **Studies in Diplomatic History of Koryo Dynasty (3)**

Considering Goryeo Dynasty's international relations against Liao, Jin, Yuan.

- **Topics in Korean History 1 (3)**

Considering Korean history I as the historical material or record.

- **Studies in the History of Old Joseon and Three Han(Samhan) (3)**

Considering history of the early stage of nation such as old Joseon and three Han focused on documentary records like Samkookji Weiji Dongeijeon.

- **Studies in the History of Paekche (3)**

Considering history Paekche as the central historical material.

- **Studies in the History of Gaya (3)**

Considering history Goguryeo as the central historical material.

- **Studies in the Bone Rank Status System of Silla Dynasty (3)**

Considering Shilla Kolp'umje's organization, change, decomposition in process as the central literature.

- **Studies in History of Later Three Kingdoms (3)**

Considering The Later Three Kingdoms as the central historical material.

- **Studies in the History of Korean Ancient Foreign Relations (3)**

Considering Korean ancient foreign relations concentrically.

- **Studies in Land-Tax System of Koryo Dynasty (3)**

Studies about Chonsikwa, Nokkwajon of Goryeo Dynasty as the central Sikhwaji.

□ Korean History(II) Major

- **Studies in Diplomatic History of Joseon Dynasty (3)**

Considering Joseon international relations against Ch'ong, Myong, Japan related to the internal troubles of Korea.

- **Studies in Social History of Joseon Dynasty (3)**

Considering politics system, military service system .etc in the Joseon Period as the central social position system.

- **Studies in Economic History of Joseon Dynasty (3)**

Considering the economic system such as land system, tribute system, monetary system, commerce and industry through the historical records.

- **Studies in Military Institution in Joseon Dynasty (3)**

Considering military system in the Joseon Period laying stress on converted process from Owiche to Ogunyong.

- **Studies in Political of Joseon Dynasty (3)**

Correlating political activities of Joseon Period people with politics system.

- **Studies in History Korean Confucianism (3)**

Considering political, social, cultural role of studying through literature data.

- **Studies of the History in the aggression of Japanese Imperialism (3)**

Considering the process of aggression and oppressive exploitation by Japan in late Joseon dynasty.

- **Studies in History of the year before and after the Liberation (3)**

Considering national liberation campaign and preparatory process of independence, under the Japanese imperialistic rules.

- **Topics in Korean History 2 (3)**

Considering Korean history II as the historical material or record.

- **Studies in Statue System of Joseon Dynasty (3)**

Considering status System in politics and society side on Joseon period.

- **Studies in Legal Institutions History of Joseon Dynasty (3)**

Studying law system in the Joseon Period as the central a code of laws.

- **Studies in Korean Ancient Documents (3)**

Reading Korean Palaeography and training eternal Palaeography's problem.

- **Studies in the Rustic literati(Sarim) Administration of Joseon Dynasty (3)**

Considering mutually confrontation and restraint in politics systematic side on Joseon Period Sarim's political activities.

- **Studies in Modern Culture in Korean History (3)**

Considering the inflow of culture modern age, civilization movement and patriotism education movement in cultural side mainly.

• **Studies in Modern Society in Korean History (3)**

Considering society variation since the 1860, the social structure of Korea under colonial rule and circumstance.

• **Studies in Modern Thought in Korean History (3)**

Considering development and current of modern history. Through modern characteristic and substance of thought.

• **Studies in Korean Nationalism (3)**

Considering nationalism position in Korean history. Through nationalism organization and development process study.

• **Studies in Korean Socialism (3)**

Considering the socialism historic a position in Korean history. Through socialism organization and change process study.

• **Contemporary Korean Social History (3)**

After liberation, everyday life and community, social and cultural change in the history of the political history behind the work to the public by examining the process of the formation of modern society, understand the depth and stereoscopic vision.

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## **Dept. of Education**

The graduate programs in the Department of Education at Kookmin University have focused on equipping professionals with an extensive knowledge of historical, philosophical, social, economic, technical and psychological influences operating on and within the educational system. There are four graduate programs in this department: (1) Educational Administration & Lifelong Education, (2) Educational Psychology, Counseling & Special Education, (3) History & Philosophy of Education, and (4) Curriculum & Educational Technology. The primary audiences for these programs are professionals who wish to improve the quality of their work in their current roles, to prepare themselves for new roles, and/or to improve their research capability. Graduates of the department can pursue their careers as university or community college professors, educational researchers, educational administrators, policy makers, lifelong educators, instructional designers, educational program developers, counselors, and special education related professionals after graduation. Each graduate program is uniquely designed to link theory with practice as described below:

### **□ Educational Administration & Lifelong Education Major**

The curriculum of the Educational Administration & Lifelong Education program is designed to prepare graduates for administrative and supervisory positions in schools, businesses and a variety of human service agencies. It provides candidates with a well-rounded but in-depth understanding of issues related to the educational policy, school administration, human resource development, and lifelong education. The program is theory and problem-based in that it addresses the relevant theories of organization, leadership, and contemporary issues likely to confront school administrators, supervisors, and lifelong educators.

### **□ Educational Psychology, Counseling, and Special Education Major**

The Educational Psychology, Counseling, and Special Education program presents a core of courses which provide professionals with the skill, mastery and competencies to deliver comprehensive counseling and educational services in many educational and community environments. It offers academic training to study cognitive, emotional and motivational characteristics of learners, as well as the problems that learners experience in the process of learning. Along with the academic training, the program provides unique practicum experiences through the university's Student Counseling Center and afterschool projects in the local public schools. Graduates of the program pursue their career in teaching, counseling, and scholarly research.

## ❑ History & Philosophy of Education Major

The History & Philosophy of Education Major offers both Master and Doctoral Programs. They are focused on the advancement of historical/philosophical knowledge as well as logical reasoning and their application to educational settings. Professional training in History & Philosophy of Education Major provides theoretical foundations to the educational process as it occurs in the home, schools, school systems and the society. Advanced degrees in History & Philosophy of Education Major will qualify students as university and college professors, education specialists, as well as provide them with the skill necessary to fill a variety of roles in other settings in which knowledge of history and philosophy of education, and that of moral education are required.

## ❑ Instructional Technology &Curriculum Major

Instructional Technology &Curriculum majorprogram deals with the theories and practices to analyze, design, develop, implement, and evaluate educational systems and programs in order to improve human learning and performance. The program provides the solid foundations for philosophical, theoretical, psychological, methodological, and technological perspectives to fulfill various educational needs. The graduates of the program will be able to work as an instructional designer, curriculum developer, learning and performance consultant, e-learning designer, and multimedia program designer.

## ❑ Courses

### ❑ Core Courses

#### • **Research Methods in Education (3)**

Provides the quantitative and the qualitative research methods widely used in education. Expansively it focuses on the experimental designs and the survey based upon the logical position in the qualitative arena. Also it scrutinizes the historical and the ethnographical research method stemmed from the phenomenology in the qualitative arena.

#### • **Advanced Statistics for Educational Research (3)**

An introduction to statistical methods needed for basic data analysis in education. Includes an introduction to distribution of variables, measures of central tendency, variability, hypothesis testing, correlation techniques, one way analysis of variance, and simple regression analysis. Emphasis is placed on theoretical and computational skill.



- **Basic Statistics for Educational Research (3)**

An introduction to statistical methods needed for basic data analysis in education. Includes an introduction to distribution of variables, measures of central tendency, variability, hypothesis testing, correlation techniques, one way analysis of variance, and simple regression analysis. Emphasis is placed on theoretical and computational skill.

☐ Educational Administration & Lifelong Education Major

- **Theory of Educational Administration (3)**

Introduction to classical and current theories of organizational behavior and administration, the administrative process, leadership in educational systems. And the application of theoretical constructs to the description and analysis of administrative behavior.

- **Theory of Educational System in North and South Korea (3)**

This course compares and analyzes South and North Korea's educational system. This course introduces participants to the strength and weakness, unique characteristics and educational problems of each educational system. This course develops alternative role of educational system in Korean unification.

- **Educational Planning (3)**

Provides the basic theories needed to understand educational planning in the system of school and context of educational system. Also this course examines the recurrent phenomenon of educational planning in a variety setting and from a variety of social perspectives. Focus is placed on the analysis of competing explanations of educational planning.

- **Educational Policy Analysis & Evaluation (3)**

Central to this course is the attempt to view policy and policy making from different perspectives. These perspectives will be applied to a variety of current policy issues in education through discussion of case examples and written assignments.

- **Educational Law (3)**

Analyzes educational laws to promote students' understanding of educational goals, policies, and institutions; methods of interpretation; and application of educational laws in the field of education.

- **Study in School Management (3)**

Analysis of current school management, school finance, personnel administration, school system, and application to the real educational situation. This course provides an overview of the role of vision in school management. The Organizational development from the perspective of the superintendent as an educational leader. A Major premise of this course is that to lead school effectively principal must have a clear vision and leadership.

- **Organizational Development in School (3)**

In this course, problems of school organization are discussed in relation to basic theories of organization, leadership, and group dynamics. This course presents an review of organization theories as they apply to schools. Topics include organizational typologies, competing models of organizational structure, organization environment linkages, and the evaluation of organizational effectiveness.

- **Human Relation Theory (3)**

Examine problems and solutions to human relationships in education and study and find ways to promote healthy human relationships. Course integrates research & theorizing from different perspectives in the disciplines of psychology, political science, sociology, information technology. Special attention given to the relation between teachers and principal.

- **Educational Leadership Development (3)**

Educational leadership theories such as transactional leadership, transformational leadership, emotional leadership, servant leadership, and moral leadership are reviewed and compared. The methods to improve educational leadership in various educational settings are explored.

- **Researches in Educational Administration (3)**

Educational administration theories are reviewed and research methods are discussed. Especially related articles are reviewed in group discussion. Also students will write his/her own term papers and present them in class.

- **Seminar on Educational Problems in Administration (3)**

Analyzes educational problems in the practical education settings and investigates the further directions to solve the educational problems. The disciplinary bases for associated inquiry in educational administration and policy study are addressed. Examples of research from various paradigms, and disciplines, and professional fields are used to show the relationship among theory and method.

- **Practicum in Educational Administration (3)**

Current issues, developments, and concerns bearing on Educational Administration.

Also in the course a basic introduction to the research methodology & statistical analysis associated with various issues of educational administration will be offered. Students will apply the skill through the development of proposal and instrument that can be applied to the field research.

- **Human Resource Management in Education (3)**

Because individuals are so important to the achievement of the goals and objectives of an educational system, human resource management is of central importance. This course will cover issues and research topics related to recruitment, selection and placement, compensation process, and performance evaluation of personnels in varied educational institutions.

- **Seminar in Lifelong Education and Human Resource Development (3)**

This course aims to raise the professional competencies of those concerned about Life long Education and Human Resource Development by providing an overview and understanding of the major principles and practices of the field. This course expects students to find their own research interest and topics in relation to the field of Lifelong Education and Human Resource Development.

- **Theoretical Foundation of Lifelong Education (3)**

This course aims to orient participants to lifelong education, develop the participants' understanding of some theoretical perspectives, and provide an opportunity for consideration of implications for practice. Topics included are selected theories and concepts of lifelong education, historical background and current issues of the field.

- **Trends & Issues in Human Resource Development (3)**

This course provides an overview of human resource development (HRD) theories and practices in the organization. Adult learning theory and the concept of the learning organization will be explored. These concepts will be used to examine the roles and responsibilities of employees and organizations in the development of the workforce throughout the employment cycle. Development of effective training programs for technical skill, management and executive development, and organization acculturation will be discussed.

- **Adult Learning Theories and Methods (3)**

The purpose of this course is to examine key approaches, perspectives and issues in learning and teaching at the adult level. This course will focus on helping students understand core theories regarding how adult learns and gain insights on how to teach adults.

- **Dissertation Seminar in Educational Administration & Lifelong Education (3)**

This seminar is designed to help students accomplish their final but crucial part of their graduate program, that is writing a dissertation. Students will be expected to have a dissertation proposal in hand by the end of the semester.

- **Program Design for Lifelong Learning (3)**

This course examines the theories and practices with regard to the planning and development of lifelong learning programs, based on psychological, physical, and emotional characteristics of adult learners and their learning needs.

- **Organizational Learning & Learning Organization (3)**

This course aims to help students understand basic concepts, background, theories, and current critical issues and problems with regard to organizational learning and learning organization.

- **HRD Consulting and Career Development Planning (3)**

This course is designed to review the theoretical framework and research methodologies for HRD consulting and to explore the theories and practices of career developing as a core area of HRD consulting.

- **Lifelong Learning and HRD Program Evaluation (3)**

This course is designed to evaluate the input, process and output of lifelong learning program and to apply the evaluation model for practice.

□ Educational Psychology, Counseling, and Special Education Major

- **Seminar in Educational Psychology (3)**

Human learning in the educational setting. Cognition, development, learning, motivation, affective processes and socialization. Emphasis on skill in influencing classroom learning and discipline.

- **Human Development and Life Cycle: cognition, emotion, sociability (3)**

Overview of the current state of empirical knowledge in the field of human development. Introduction to key topics relating to each of the major periods of human growth beginning with infancy. Focus is on the adolescent development in relation to social and personality psychology researches to examine the effect on school achievement and psychological well-being. Additional emphasis is on what these diverse approaches propose, and on critical evaluation of human development theory and research

- **Psychological Assessment (3)**

An overview of the principles and methods of psychological assessment including

observational methods, interviewing, behavioral analysis, and standardized psychological testing as a means to arriving at a comprehensive individual analysis and of creating a treatment plan for both children and adults.

- **School Counseling and Guidance (3)**

A comprehensive understanding of major counseling theories, practices, and issues of school counseling in relation with the problems of adolescents. Study of guidance programs with diverse topics in elementary and secondary schools. Attention is given to the role of specialists in school guidance programs.

- **Supervision and Case study (3)**

Designed to provide foundation for professional counseling and the skills necessary for professional training in counseling psychology and related field

- **Parent Education and Family Counseling (3)**

Based on developmental psychology, the various perspectives and applications of proper parenting are presented. Also introduce the fundamentals of family counseling theory and practice, emphasizing family dynamics and communication analysis.

- **Understanding Learning and Instruction for Students with Difficulties (3)**

This course focuses on the nature of the reading process, current literacy theory and practices, and research-based instructional strategies to develop literacy skills in emergent and developing readers and students with reading/learning disabilities. Differences in reading abilities will be examined in light of providing appropriate, effective, and meaningful literacy instruction.

- **Special Education Assessment & Diagnostics (3)**

This course focuses on the diagnosis of disabilities emphasis on learning disabilities. Assessment techniques for reading difficulties and the array of continuous assessments that a teacher may employ to appropriately develop remediation strategies will be introduced. Emphasis is placed on using assessment to guide instruction and remediation. Remediation strategies and effective reading programs are also introduced.

- **Instructional Techniques for Students with Special Needs (3)**

This course presents cognitive and behavioral instructional approaches for teaching children with special needs in a variety of service delivery options. Students will be able to analyze instructional approaches, strategies, and materials for advanced-level consultant and resource teachers in special education. The emphasis of this course is the development of interactive skills among professionals in order to facilitate collaboration with general education.

- **Psychology of Learning and Motivation (3)**

An intermediate educational psychology class covering how people learn and remember what motivates the students to learn and how learning and motivation are shaped by social context in homes, schools, and communities. In addition to traditional motivation theories, current cognitive and socio-cultural theories of learning and motivation are introduced.

- **Current Issues and Researches in Educational Psychology (3)**

Seminal on current issues of educational psychology: a critical appraisal of the implication for current issues modern psychological findings in advanced educational psychology. Special attention to presentation of practical problems in development, learning, and teaching in classroom.

- **Development and Practice of Educational Programs (3)**

Advanced study of the theories and processes of educational psychology at secondary school level. Study and application of theories, concept, and techniques related to academic achievement and educational programs

- **Psychopathology (3)**

Study of contemporary school problems and maladaptive behaviors of school age youth with emphasis on developmental, personality issues and practical interventions.

- **Seminar in Human Learning and Thinking (3)**

Systemic examination of current research about human learning in educational settings, including the study of behavioral, information processing, social construction and the developmental perspectives on learning and thinking.

- **Learning strategies and consulting (3)**

Examine the researches and critiques of current literature pertaining to the effects of students' learning strategies and motivation at various levels of education in order to identify key trends and findings.

- **Teaching Students with Speech and Language Impairment (3)**

Candidates will study characteristics and types of communication disabilities and understand social/academic difficulties that students with communication disabilities experiences. Candidates will learn the different educational techniques that should be modified for the successful learning and students with communication disabilities.

- **Dissertation seminar (3)**

Presentation and discussion of current issues related to graduate study in educational, counseling psychology and special education by advanced graduate students, members of the faculty, and visiting lecturers.

- **Clinical Practicum : Learning Disabilities (3)**

Candidates will directly teach and evaluate the progress of students with learning and reading disabilities. Through the course, candidates will administer assessment tools on cognitive abilities, oral language, and achievement in reading, spelling, and writing. Interpreting test results and writing profiling report is also required. Candidates will learn to make informed instructional decisions to meet the unique needs of individual readers and deliver the scientifically proved effective instruction.

- **Seminar in Mathematics Disabilities (3)**

This course provides principles, methods, and specially designed mathematics instruction for students with learning disabilities or mild/moderate mental retardation. Students will learn about concept development, concrete materials, procedural learning, memory strategies and compensations.

- **Seminar in Dyslexia (3)**

This course provides in-depth learning experiences targeting literacy; both reading and writing. Students will learn about current issues around reading disabilities including assessment, diagnosis, intervention and school policy. The course also provides evidence-based instructional approaches and effective curriculum that has been developed for multicultural students and other at risk students.

- **Understanding Emotional and Behavioral Disabilities (3)**

This research-based introductory course will provide comprehensive information on Emotional and Behavioral disorders. The course material will provide you with information on the following: definitions, characteristics, prevalence, causes, assessment, education service placements, functional behavior assessment, ABA and Positive Behavior Supports, advocacy, and current issues in the field.

- **History & Philosophy of Education Major**

- **History of Educational Thoughts (3)**

Examines the historical development of educational thoughts in major countries, on the basis of cultural, philosophical, religious, and socio political backgrounds.

- **Study in History of Korean Education (3)**

Provides a historical review of Korean educational ideas and practices. Also provides an understanding of the evolution of educational thoughts in Korea,

- **Study in History of Western Education (3)**

Provides a historical review of Western educational thought, explores the relations between cultural background and education, and analyzes important educational references with philosophical background.

- **Researches in History of Education (3)**

Studies some major topics in the history of education, for example the aim of education, educational institutions, the nature of educational process, the principle of educational policy, etc. with particular emphasis on the methodology of historical inquiry. Students are required to write his/her own term-papers and to present them in class.

- **Comparative Study in Educational Thoughts (3)**

Provides comparative review of Eastern especially traditional Korean and Western educational thoughts by looking into the genealogy of historical and cultural thought.

- **Researches in Philosophy of Education (3)**

Studies some major philosophical topics on education, such as the concept of education, indoctrination, the nature of teaching and learning, moral issues in education etc. with particular emphasis on the methodology of philosophical inquiry. Students are required to write his/her own term-papers and to present them in class.

- **Language & Logic in Education (3)**

Focuses on the understanding of definitions, regulations and theories in education. Provides the basic study needed to understand scientific philosophical matter related to research method in education.

- **Epistemological Foundations of Education (3)**

It examines some epistemological issues on teaching-learning as an educational process. It deals with various theories of epistemology which contains the concept of leaning, conditions of knowledge, criteria of truth etc.

- **Ethical Foundations of Education (3)**

It examines some ethical problems in educational setting to enhance understanding on the peculiarity of moral discourses. It deals with such topics as punishment and



discipline, freedom of student, equality, authority of teacher, respect for person, democracy and education etc.

- **Studies in Educational Classics (3)**

Provides an advanced understanding of how education has been developed in the sight of its thoughts and systems. It examines the historical development of educational thoughts and systems in major countries, on the basis of cultural, philosophical, religious, and socio-political backgrounds. It provides an advanced course of the 'History of Educational Thoughts', the 'Study in History of Korean Education' and the 'Study in History of Western Education'.

- **Seminar in History of Education (3)**

Surveys the history of education with particular reference to changing organizations of education, educational theories, the relations between political power and formal education in each period.

- **Philosophy of Educational Science (3)**

Surveys some of the most important and influential questions in the philosophy of science with particular reference to education. Topics may include reductionism, the realism/antirealism debate, the relationships that hold between the special sciences, the nature of scientific explanation, and revolution in science.

- **Psychological Philosophy & Education (3)**

Provides an advanced course of the 'Epistemological Foundations of Education'. Studies psychological phenomenon such as thinking, volition, affection, motivation etc. It provides some understanding of recent psychological philosophical researches and their outcomes which are relevant to education.

- **Social Philosophy & Education (3)**

Provides some understanding of major issues of social philosophy in education. It examines those concepts like freedom, equality, justice, wellbeing, interests of students etc. It provides an advanced course of the 'Ethical Foundations of Education'.

- **Contemporary Thoughts & Education (3)**

Examines the recent trends in social thoughts and philosophy of education, the world wide trends in educational policies and practices.

- **Seminar in Philosophy of Education (3)**

Examines the recent trends in social thoughts and philosophy of education, the world wide trends in educational policies and practices.

❑ Introductional Technology & Curriculum Major

• **Qualitative Curriculum Research (3)**

The course reviews the theoretical foundations and practical changing processes of elementary, middle, and high school curricula. Students will analyze and evaluate the current school curricula and investigate the new ways of innovating school curricula and discuss the main issues related to the school curriculum innovations based on individual case analysis.

• **The History of Curriculum Studies (3)**

The course reviews the changing process of curricula through main literature reviews. Students will discuss various perspectives, which affect the curriculum change such as social, political, and cultural factors.

• **The Philosophy of Curriculum (3)**

The course studies curriculum standard, curriculum scope, and the basic principles and methods of program evaluation based on curriculum change. Students will be able to develop the curriculum evaluation strategy and evaluation rubrics, which reflect the recent theories and research.

• **Advanced Seminar on Curriculum Studies (3)**

The course deals with the theoretical bases of curriculum as a scholastic field. Students will investigate the concepts, scopes, characteristics, and main issues of curriculum, as well as discuss the particular research interest areas by reading the previous research articles.

• **Application of Teaching and Learning Theory (3)**

The course investigates the various perspectives of behaviorism, cognitivism, and constructivism, which explain the causal effects of human teaching and learning process and results. Students will obtain the knowledge and skills of designing the human learning process in effective and efficient ways.

• **Individual Design & Development of Curriculum and Instructional Systems (3)**

The course sets up the research topics related to the computer-based instruction, multimedia, distance learning, and instructional programs under the instructor's individual guidances. Students will design and develop the curricula and instructional systems in order to define the research problems based on theoretical backgrounds.

• **Research on Adaptive Curriculum & Instructional Systems (3)**

The course not only defines the research problems related to the computer-based instruction, multimedia, distance learning, and various instructional programs, but

also design and develop the curricula or instructional programs to solve the defined problems.

- **Curriculum Policy Studies (3)**

The course identifies the recent trends and issues in theories, models, instructional design, theorists, instructional strategies, technology application, research methods, and evaluation methods related to the educational technology. Students will have profound discussions regarding the effects of the recent trends and issues in educational technology on human learning and performance improvement.

- **Theory & Practice of Educational Technology (3)**

The course researches on the recent trends and issues of theories, models, instructional design, theorists, technology application, research and evaluation methods related to educational technology. Students will discuss the effects of human learning and performance improvement.

- **Cognitive Science Based Instructional Design (3)**

The course reviews the instructional design models based on cognitive and constructive theoretical backgrounds. Students will analyze the theories and practices of human cognitive learning process and results as well as apply them for an individual research project and for particular learners.

- **Performance Technology and Consulting (3)**

The course analyzes, designs, develops, implements, and evaluates various instructional as well as non-instructional interventions in order to solve the human performance problems in various organizations. Students will build the theoretical and practical backgrounds of human performance technology.

- **Design & Development of Web-based Instruction (3)**

The course reviews the recent theoretical foundations, methods, trends and issues of web-based instructions. Students will design an actual learning program for particular learners with a particular subject area of interest. At the same time, students will participate in profound discussions regarding the effective application, integration and management of ICT(Information and Communication Technology).

- **Seminar in Instructional Design (3)**

The course analyzes and reviews the recent trends and issues of curriculum and instructional design. Students will research and discuss the recent theories and practices as well as perform individual research projects based on previous research results in relevant areas.

• **Thesis Seminar in Educational Technology (3)**

Learners will analyze and discuss the recent research trends and issues in instructional systems by reviewing various literature and each learner will devise the basic ideas for their thesis.

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## **Dept. of Public Administration**

Contemporary governments have faced a number of vexing public policy problems in the development of scientific technology and information society and local self government. The Department of Public Administration has been dedicated to provide outstanding programs corresponding to various demands for public management and public policy. Its curriculum ensures that all graduates understand the political, economic, and social context of public administration; achieve substantial competency in management techniques; and gain experience in applying qualitative and quantitative analysis to public policy issues. In recent years, governments, nonprofit and private employers need highly -skilled, well -trained public policy analysts and administrators. Many of our graduates hold leadership positions across the spectrum of public, nonprofit, and private organizations.

The Department of Public Administration provides Master degree, Ph.D. degree, and unified both Master and Ph.D degree course. The Master course is divided into two majors, public administration and public policy, both of which focus on basic knowledge and skills for Ph.D. course. The Ph.D. course intends to provide leading scholars and policy specialists that can competently and effectively deal with a variety of public administration and policy problems.

### **☐ Public Administration Major**

The Public Administration Major is designed to explore the theory and practice associated with management of public programs in central and local government. This major offers a variety of courses relating topics and issues in efficient and effective management of public affairs such as organization theory, human resource, public finance, strategic performance, public marketing, resource allocation and local administration. It serves students to pursue their academic and practical career goals in the department of public administration, research institute, central and local government and other public institutions.

### **☐ Public Policy Major**

Contemporary government, nonprofit as well as private institutions and organizations confront a wide variety of complex public policy problems in the 21<sup>st</sup> century. The public policy major program provides both a comprehensive knowledge on policy studies and learning opportunities to master analytical skills. At the end of day, students can be high-skilled and well-trained public policy professionals who can dissect a problem, analyze and interpret both quantitative and qualitative data, and evaluate and craft concrete solutions.

## ☐ **Courses**

### ☐ Core Courses

- **Theories of Public Policy (3)**

Theories of public policy provide an introduction to general theories in public policy and basic knowledge required for specific policy fields. The course particularly covers some assumptions and applicability of prescriptive and descriptive theories to public policy issues.

- **Theories of Public Administration (3)**

Theories of public administration provide an introduction to the theories of public administration including definitions, development of administration, theories and major concepts of administration.

- **Methodology of Social Science (3)**

Research Methods consists of three components: 1) the philosophy of knowledge (epistemology); 2) theory and approaches; and 3) research process and techniques. This course focuses on the philosophy of knowledge concerned with issues such as descriptions, explanations, predictions of social phenomena.

- **Research Ethics and Thesis Study(3)**

This course focuses on research process where theories and practices are linked and emphasizes research ethics and plagiarism issues for the academic studies.

- **Quantitative Analysis (3)**

The primary goal of this course is to introduce you to advance statistical methods that will help you make a critical decision in the field of public administration. In particular, this course will emphasize the application of multivariate statistics and other analytical tools in the analysis of problems and issues relevant to the public sector. The focus of the course is on the analytical as opposed to the purely statistical. This course will help you to understand the important concepts of quantitative methods in public administration and apply them to the reality.

### ☐ Public Administration Major

- **Government Budgeting (3)**

This course provides an overview of the governmental budgetary process focusing on the formation and implementation of government budgetary policies.

- **Organization Theories (3)**

This course teaches the students organization theories regarding formal structures, human relations, inter-organizational conflicts, and especially new theories about organizational management.

- **Administrative Ethics (3)**

This course is designed to enhance students' understanding of theoretical backgrounds and administrative processes for public interest.

- **Seminar in Bureaucracy (3)**

This course examines bureaucratic power in modern society and discusses democratic control and accountability for bureaucratic process.

- **Seminar in Government Finance (3)**

This course examines theories in public budgeting and principal components of budget system. It also explores controversial issues regarding political processes, bureaucratic behavior, and implementation in budget.

- **Seminar in Public Enterprises (3)**

Contents of this course include the role of public enterprises, a relationship between economic development and public enterprises, and effective management strategies for public enterprises.

- **Seminar in Welfare Administration (3)**

This course is designed to provide an overview of social welfare policy and its mechanisms. What is emphasized in this course and curriculum includes an intensive research for a specific welfare program.

- **Local Government Administration (3)**

This course focuses on local governance structure for local communities, especially on an administrative division and cooperation between central government and local government and disintegration and reunification of administrative regions.

- **Research in Urban Administration (3)**

Urban problems have emerged as policy conundrum that has had important effects on society. This course explores analytical tools and policy suggestions for a analysis of urban phenomena.

- **Research in Environmental Administration (3)**

This class deals with the establishment and management of various environmental administrations and environmental technology to prevent and control for environmental pollution of air, soil, water, and housing.

- **Seminar in Selected Problems in Public Personnel Management (3)**

Selected problems in public personnel administration, using case studies and other vehicles to simulate realistic situations encountered in public agencies. Developing analytical and behavioral skills are applicable in public personnel administration.

- **Strategy Performance in the Management Public sector (3)**

This course is designed to provide graduate students with insights on public sector

productivity issues. Productivity improvement is a very complicated and comprehensive concept, there by requiring a comprehensive approach. If the term productivity were simply defined as the ration of output to input, then this course would not be necessary. We will read many journal articles from both business and public administration areas, and search out theory and practice in organizational productivity programs.

- **Leadership Research (3)**

This course examines an overview of leadership theories and situational theories in organizational contexts. It also deals with a relationship between leaders and followers in social contexts.

- **Organization Behavior and Culture (3)**

This course is designed to cover key components of organization theory and management applications, including organization structure, culture, environment, leadership, change / innovation, and other emerging organization / management themes. An emphasis will be focused on public and nonprofit organization through private organization will be discussed from comparative perspective.

- **Labor Relations in the Public Sector (3)**

Public sector labor relations and collective bargaining; Included in the topics are issues related to labor relations theory in general, procedures of labor relations, collective bargaining and other important civil service reform issues.

- **Case Studys in Public Administration (3)**

This course touches public administration issues including organizational management, performance measures, and human resources in public organizations. It provides various empirical analyses and rival theoretical perspectives.

- **Dissertation Writing and Independent Research(3)**

Practice for writing a research paper on a social phenomenon, based on the theories and methods learned throughout the course.

- **Public Marketing(3)**

This course investigates marketing theories, strategies and case studies for enhancing citizens' complacences and satisfactions on public management and policy implementation in the public sector.

- **Public Administrative Institutions(3)**

This course examines theories and practices regarding institutional process where it burgeons up and declines, while investigating linkages between networks and governance issues.

- **Public Management(3)**

This course aims to making students realize the nature of public management and



understand the roles of public managers. This course deals with a variety of issues concerning strategies and innovations, while it tries to connect governance to participation issues in the public sector.

❑ Public Policy Major

• **Administrative Planning (3)**

This course examines planning theories and the role of planning in modern industrial society.

• **Korean Government Administration (3)**

As an introduction to Korean public administration, the focus for this course is on historical developments, current issues, political and economic conditions in Korean public administration.

• **Public Personnel Administration (3)**

Examines the history of public personnel administration; comparative concepts of civil service, the merit system, and job classification; studies the characteristics of personnel administration in Korea; offers a modern view of personnel administration and its problems; and explores its remedies using modern management skills.

• **Industrial Policy (3)**

This course examines social, cultural, and economic factors for industrialization and the results of the industrialization process.

• **Research in Demographic Policy (3)**

This course provides an overview of the history and theoretical background of demographic policy. This course also examines an increasing trend of population in South Korea and social and cultural implications of them.

• **Housing and Land Policy (3)**

This course deals with the planning and prediction of national housing, the construction of housing lots, the role division between public and private sector, and policy actors involved in the housing policy.

• **Seminar in Policy Analysis (3)**

An introduction to the theory and practice of policy analysis, covering the following topics: theoretical frameworks and criteria for and the political context and ethics of policy analysis.

• **Seminar in Science-Technology Policy (3)**

This seminar examines an optimal mobilization of technological and scientific resources, the development of technology and its policy formation, and an assessment and prediction of technology.

- **Seminar in Welfare Policy (3)**

This course is designed to provide an overview of social welfare policy and its mechanisms. What is emphasized in this course and curriculum includes an intensive research for a specific welfare program.

- **Seminar in Environmental Policy (3)**

This seminar provides a broad review and discussion of environmental problems that face human beings in the 21st century. Furthermore, this seminar is designed to enhance students' understanding of a close interaction between nature and human society and to explore policy alternatives from past and current environmental problems.

- **Seminar in Education Policy (3)**

This course reviews research that deals with a number of questions of education policy. One topic focuses on the decision to investing education and how this decision is affected by ability, family background, and other factors. The other topic discusses the relationship between education and social welfare that is, how education affects economic growth and the distribution of income.

- **Health and Medical Policy (3)**

The purpose of this course is to provide a framework for the critical examination of issues affecting health care and an overview of current issues such as health care reform and regulation. In addition, the course work initially focuses on specific areas of health care policy and subsequently ties several issues together in a discussion of state and national health care reform in the United States.

- **Case Studies in Public Policy (3)**

This course examines a relationship between policeman and residents, managerial skills for the solution to community problems, and the management of police organizations including planning, finance, and personnel administration.

- **Information and Communication Policy**

Studies and analyses the political, administrative, organizational, and technical issues of public administration resulting from the introduction and use of information technology; examines how information technology changes people, the government, and society as a whole.

- **State and Market (3)**

This course is a study of the theories of political economy from the beginning of the capitalist society to the present. This course answers the following questions: what capital is, what the logic of capital is, and what the movement of capital is.

- **Policy Evaluation (3)**

This course is intended to develop practice skills in policy evaluation. Techniques of evaluation, such as benefit?cost analysis, are used to measure the degree of

attainment of policy goals.

- **Resource Allocation & Distribution (3)**

This course examines various mechanisms in resource allocation between government and government or between government and the private sector and their effects on allocate efficiency and distributive equity.

- **Theories and Practice about e-Government (3)**

This course examines the conceptual problems of e-Government in terms of noise and distortion involved in the process of communicating e-Government contents. Furthermore, this course examines e-Government information gathering, processing, evaluation, and accumulation based on a relationship between the nature of such information problems and social behaviors.

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## Dept. of Political Science and International Relations

The Department of Political Science and International Relations is offering the M.A. program since 1981 and the Ph.D. program since 1984. The Graduate Program reflects the methodological diversity of the discipline in order to offer various opportunities for graduate students to concentrate on their specific field of interest. The major fields are political thoughts and theories, political history, comparative politics, international relations, political economy, and Korean politics.

The Department of Political Science and International Relations aims to train students to become specialists, who will engage in domestic and international affairs by offering a variety of opportunities for students to understand and develop theories in order to analyze domestic and international politics in a science manner. Our graduates will play an important role in society as scholars who are specialists to cope with the influence of regional integration and globalization, and as elites to work for diverse organizations to promote human peace and welfare.

### ☐ Political Thoughts and Theories Major

A study of political thoughts, political theories, issues and practices.

### ☐ Comparative Politics Major

An analysis of various political problems through comparative research.

### ☐ International Relations Major

An analysis of such international issues as war and peace, domestic and international economic relations, international politics and security, and international cooperation.

### ☐ Political Management Major

A study of offering opportunities for acquiring practical knowledge and experience by connecting theories real political affairs.

### ☐ **Courses**

#### ☐ Core Courses

##### • **Contemporary Political Theories (3)**

A comprehensive study of contemporary political theories along with their applications and problems.

##### • **Theories of International Relations (3)**

A study of diverse theories of international relations such as traditional theories of power politics, theories of international systems, theories of foreign policy making and theories of international integration.

- **Theories of Comparative Politics (3)**

A study of major comparative theories and research methods for analyzing domestic politics.

- **Theoretical Methodology and Research Methods in Political Science (3)**

A study of methodological approaches to deal with the nature, scope, and limits of political science with emphasis on general research methods in political science.

- **Political Leadership (3)**

A study on relationships between political leadership and democratic societies in suggesting an alternative leadership for political innovation.

- **Parliamentary Politics (3)**

Focusing on understanding the process of parliamentary politics and practice, including legislative proposal, submission and deliberation, budget deliberation inspection of the administration, public hearings, and diverse committees.

- **Political Thoughts & Theories Major**

- **The History of Political Thoughts (3)**

A study of the development of political thoughts.

- **Western Political Thoughts (3)**

An analysis of origins and implications of political thoughts in West.

- **Asian Political Thoughts (3)**

A study of traditional political thoughts in Asia with a particular emphasis on their changing process under the influence of Western political thoughts.

- **Korean Political Thoughts (3)**

A study of traditional political thoughts in Korea with a particular emphasis on their changing process under the influence of other political thoughts, including the Chinese.

- **Socialist Thoughts (3)**

A comprehensive introduction to the theoretical logic, ideological background and development of socialist thoughts, and the nature of contemporary communist thoughts.

- **Political Sociology (3)**

A study of the origin, emergence and the nature of political sociology.

- **Theories of Policy-Making (3)**

An introduction to the diverse theories of policy making and an analysis of factors that affect the policy making.

- **Political Institutions (3)**

A study of political institutions that affect political behaviour.

- **Political Behaviors (3)**

A study of behavioral approaches to politics, focusing on their impact on political researches by criticizing traditional ones.

- **Political Economy (3)**

A study of interrelationships between political and economic variables.

- **Nationalism (3)**

A study of the origin, major theories and the aspects of nationalism with a focus on its development and prospect.

- **Contemporary Political Philosophy (3)**

An analysis of the origin and nature of major thoughts in contemporary political philosophy.

- Comparative Politics Major

- **Political Development (3)**

A study of diverse theories of political development and their applications to political process.

- **Political Process (3)**

A study of theories of political process with a focus on the relationship between social and political process.

- **Political Culture (3)**

A study of the concept of political culture and relationship between political institutions(structure) in the field of behavioral political science.

- **Government and Politics in Korea (3)**

A comparative study of political systems, political processes and political culture in Korea.

- **Government and Politics in Europe (3)**

A comparative study of political systems, political processes and political culture in Europe.

- **Government and Politics in America (3)**

A study of political traditions, political culture and political processes in American politics.

- **Government and Politics in Asia (3)**

A study of political traditions, political culture and political processes in Asian politics.

- **Government and Politics in Africa (3)**

A study of political traditions, political culture and political processes in African politics.

- **Government and Politics in North Korea (3)**

A study of North Korean politics, including political ideas for governance, South and North Korean unification policies and its relation with China and Russia.

- **Government and Politics in Newly Industrial Countries (3)**

A study of political ideas and current issues in Newly Industrial Countries.

- **Politics in the Information Society (3)**

A study of relationships between information and politics in focusing on electronic democracy, electronic administration, internet politics, the political management of information technology, and cyber international politics.

- **Practices of Political Analysis (3)**

A study of theorizing and analyzing real politics.

- **NGO Politics (3)**

A study of how NGOs affect both domestic and international politics.

❑ International Relations Major

- **Foreign Policy (3)**

A study of the process of foreign policy-making with a focus on factors which affect the formation of foreign policies.

- **Korean Foreign Policy (3)**

A study of policy goals and domestic and international factors which affect Korean foreign policy-making.

- **International Relations in Europe (3)**

A study of characteristics and changes of international relations in Europe.

- **International Relations in America (3)**

A study of characteristics and changes of international relations in America.

- **International Relations in Asia (3)**

A study of characteristics and changes of international relations in Asia.

- **International Relations in Africa (3)**

A study of characteristics and changes of international relations in Africa.



- **International Relations in Northeast Asia (3)**

An analysis of Northeast Asian international order the balance of power among the United States, Russia, China and Japan and different ideas and interests in international relations.

- **International Organization (3)**

A study of the current issues of international politics in association with international organizations.

- **International Political Economy (3)**

A study of relationships between international and domestic politics and international economy

- **International Cooperation (3)**

A study of how states cooperate for the coexistence of international society.

- **International Cultural Relations (3)**

A study of analyzing international relations not only from the political and military perspective but from the cultural one in order to examine the global society after the period of cold war.

- **Environment and International Politics (3)**

An analysis of how environmental problems as a global issue have been discussed and solved in the context of international politics.

- **International Politics and Korean Unification (3)**

A study of Korean unification in relation to international politics: a search for a peaceful Korean unification lies the balance of power among the major powers and in wake of changing international situations.

- ❑ **Political Management Major**

- **Politics Related Laws (3)**

A study of analyzing and interpreting politics-related laws, which deal with elections, political parties, and political funds.

- **Theories and Practice of Electoral Campaign Strategy and Management (3)**

A study on the basic rules and professional techniques that constitute successful electoral campaign strategies and its practice.

- **Opinion Formation and Survey (3)**

An improved understanding and practical application of general opinion researches and its rightful interpretation.

- **Theories and Practice of Local Politics (3)**

Understanding local politics in Korea and its problems.

- **Theories and Practice of Woman Politics (3)**

A study not only on the roles of women as citizen, voters, candidates, and leader, but on the feminine political paradigm as an alternative projective for well-functioning democracy.

- **Policies for Women (3)**

A study on policies for women in various sectors and countries by focusing on the BPA as a widely accepted principle

- **Practice in Public Speech (3)**

A Detailed and structural study on how to set a topic, organize the lines, use rhetorics, and convey the idea of purpose for public speeches.

- **Practice of Political Leadership (3)**

A study on relationships between political leadership and democratic societies in suggesting an alternative leadership for political innovation.

- **Theories and Practice of Political Advertisement (3)**

A study on relationships between politics and media, makings, in understanding mass psychology for political advertisement and its actual application.

- **Practice of Legislative Process (3)**

Understanding of legislative processes and roles of law-making bodies in modern democratic countries.

- **Support Legislative Affair (3)**

A studying on the practice of supporting legislative affairs in Korea from the comparative perspective.

- **Internet Politics (3)**

A study on politics in the age of informatization by understanding effects of information and telecommunications technologies on political processes and social changes in the modern society.

- **Political Communications (3)**

A study on roles of mass communication in political processes in analyzing interrelationships between mass media and political group, including the government.

❑ **National Security Major**

- **National Security (3)**

This course discusses theories of national security with the focus on their applicability to the contemporary world politics.

- **International Politics (3)**

This course introduces students to the major theories of International Relations and discusses contemporary issues in world politics.

- **Military Cooperation and Diplomacy (3)**

This course reviews the history of military cooperation among the countries and discusses the related issues.

- **Northeast Asian International Relations (3)**

This course reviews the history of international relations in Northeast Asia with the aim of understanding the conditions for peace-building in the region.

- **ROK-US Relations (3)**

This course covers the history of the ROK-US relations since the Korean War with the focus on the military cooperation between them.

- **East Asian International Political History (3)**

This course covers the history of international relations among the East Asian countries with the aim of understanding contemporary political issues from the past experiences.

- **Defense Policies (3)**

This course reviews the Korean defense policy both theoretically and historically and explores the future direction of it.

- **Defense Project Management (3)**

This course deals with the theories and empirics of defense project management and their implications to Korean defense system.

- **Contemporary Military Theories (3)**

This course discusses the contemporary military theories on the deterrence and the battlefield management and evaluates their applicability to Korea.

- **Military Strategy (3)**

This course covers the relationship between national defense strategy and military strategy and applies major theoretical approaches to the Korean case.

- **Defense Planning (3)**

Defense planning proceeds from the threat detection to the strategy building. This course addresses the process of defense planning and compares major approaches to it.

- **Research Ethics & Thesis Study (3)**

This course introduces students to the methodology of political research and discusses students' research topics on the basis of it.

• **Defense Reform (3)**

This course explores the conditions for the successful defense reform by comparing various cases on the issue.

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## **Dept. of Sociology**

Sociology explores the causes of order and changes in human societies by analysing scientifically the structure and progress of a society as well as the characteristics of the human being. Sociologists understand individuals as both elements and products of a society. Therefore, a sociological perspective considers both individuals and their social contexts simultaneously in explaining all human behaviour and social phenomena. As modern societies become ever more diversified and complex, sociological perspectives and insights are increasingly required to understand social changes and to find useful lines of actions. The educational objective of this program is to offer students sociological insights to analyse scientifically the social phenomena through a variety of theories and research methods.

The following areas of knowledge are central to the graduate degree in sociology: Knowledge of the fundamental concepts, theories, and modes of explanation appropriate to the understanding of human societies: 1) Knowledge of the structure of modern societies, its social stratification, its ethnic, racial, religious, and gender differentiation, and its main social institutions -- family, polity, economy, sports, and religion: 2) Knowledge of the basic social processes that maintain and alter social structure, especially the processes of integration, organization, and conflict: and 3) Understanding the diversity of human societies, including the differences between major historical types such as agricultural, industrial, and information societies.

### **❑ Sociological Theories & Korean Society Major**

This program has faculty with theoretical and research interests in Korean society. Its areas includes the history and culture of Korean society, and the characteristics of Korean people. The program also emphasizes the ability of applying various sociological theories and research tools to analyze the previous study of Korean society.

### **❑ Future & Information Society Major**

Reflecting recent growth and development in future studies and information society, our graduate program includes studies of cyber-space, web-based lifestyle, and information, community.

### **❑ Science, Technology & Environment Major**

The program emphasizes an interdisciplinary approach to technology and society. It also includes environment pollution and life of human being, and explores a new structure for their harmony.

## ❑ Culture & Sports Major

This program emphasizes the study of culture-in-general and the process of the reproduction and consumption of mass culture. The program also focuses on the history of leisure and modern sports.

## ❑ Courses

### ❑ Core Courses

- **Debates on Sociological Thoughts (3)**

An overview of the major trends of sociological thoughts from the beginning to the modern period: and of connections between classical sociology and recent theoretical approaches including functionalism, structuralism, Marxism and symbolic interactionism.

- **Seminar on Contemporary Sociological Theory (3)**

This seminar deals with the various currents and issues of contemporary sociological thoughts.

- **Seminar on Social Statistics (3)**

A Seminar on Social Statistics covers special topics on Multiple Regression Analysis, Path Analysis, Factor Analysis, and Structural Equation Model.

- **Advanced Methodology of Social Research (3)**

An advanced overview of the research process in social science, including techniques of sampling, methods of data collection, principles of measurement, problems of inference and proof, basic methods of data analysis and ethical considerations.

- **Future Studies (3)**

Trends in the development of information and communication technologies and their related social changes. A discussion on alternative paths of future society and their respective characteristics and problems.

- **History of Sociology (3)**

An overview of the history of sociology from the early period to modern times.

- **Methodology of Sociological Research (3)**

A survey of methods and techniques used by sociologists and other social scientists for gathering and interpreting information about human social behavior. An advanced course of the practice of social research, including techniques of sampling, methods of data collection, and analyzing data.

- **Practice of Social Survey Analysis (3)**

A practice of conducting a research on a social phenomenon, based on the theories and methods learned throughout the course.

- **Contemporary Sociological Theories (3)**

This course deals with the various currents and issues of contemporary sociological theories.

- **Seminar on Contemporary Social Thoughts (3)**

This seminar deals with the various current issues of contemporary sociological thoughts.

☐ Sociological Theories & Korean Society Major

- **Comparative Sociology (3)**

The course focuses on the history and general theories of comparative sociology. Major focus on comparative analyses of social structure, kinship, policy and bureaucracy, economics and stratification, and institutionalized belief systems. Some attention is given to culture and personality and to cross-cultural methodology.

- **Social History of Korea (3)**

The characteristics of Korean society from ancient to modern times are analyzed from a sociological viewpoint.

- **Research on Korean Culture (3)**

This course reviews various theoretical perspectives on culture studies dealing with culture change, mass culture, culture and class, culture and power, etc. It also studies cultural aspects of Korean society and especially focuses on the reproduction process and the condition of Korean culture.

- **Social Problems in Korea (3)**

The course attempts to analyze several problems in Korean society, paying attention to their causes and consequences.

- **Research on Social Structure of Korea (3)**

The course focuses on analyses of the social structure of Korean society from a viewpoint of actors and system.

- **Studies on North Korea (3)**

This course explores the history, structure, culture, and social problems of North Korea.

- **Sociology of Knowledge (3)**

This course studies sociological theories on the social conditions of knowledge making, and especially focuses on the nature of social construction of scientific knowledge.

- **Theories of Korean Studies (3)**

This course studies sociological thoughts in Korean society and sociologically analyzes its types and main issues.

- **Future & Information Society Major**

- **Research on Social Change (3)**

The course attempts to analyze the concept of social change and assess the strengths and weaknesses of the different theories of social change.

- **Methodology of Futuristics (3)**

This course explores the relationship between information technology and society with the aim of predicting modern societies and future society.

- **Social Problems of the Future (3)**

This course studies social problems of the future and especially focuses on the new social phenomena in future society.

- **Web Life Styles (3)**

The course examines the characteristics of the web-based life and its impacts on our daily life.

- **Culture Industry (3)**

The course analyzes various aspects of cultural industry and its roles in modern societies.

- **Work and Occupational Structure of Information Society (3)**

The structure of information society is analyzed in comparison with the previous types of societies.

- **Organizations and Institutions of Information Society (3)**

This course studies social changes of organizations and institutions brought by the advances of information technology such as the Internet, and computer mediated communication. The issues cover the various perspectives in information society.

- **Quality of Life and Social Welfare (3)**



The course examines the concept of quality of life and various theories on social welfare.

- **Theories on Information Technology (3)**

The course analyzes the various aspects of information technology and current situation and future tasks of information industries.

- **Research on Cyber Community (3)**

This course will introduce students to a new body of literature on cyber communities by examining key theoretical and empirical works. Graduate students will also explore an innovative research methodology, cyber ethnography, to develop and conduct individual research projects.

❑ Science, Technology & Environment Major

- **Sociology of Science (3)**

The course analyses the relationship between science and society from sociological perspectives. It examines the theoretical approaches from the Mertonian School to the sociology of scientific knowledge(SSK). With such a theoretical understanding, it then deals with more practical issues on science as a social process.

- **Sociology of Technology (3)**

This course explores the relationship between technology and society, in both aspects of social shaping of technology and technological shaping of society. It introduces the recent theoretical developments in the field of sociology of technology. Then it covers more practical issues emerging from the interaction between technology and society.

- **Sociology of Environment (3)**

The problems of environmental pollution are analyzed in relation to social change, modernization, and urbanization. The changing relationships between nature and society are closely scrutinized. The concept of 'risk society', as a major theoretical development in this field of sociology, is critically examined in terms of its relevance to the realities of environmental problems.

- **Gender, Science and Environment (3)**

This course studies the complex inter-relations between gender, science and environment. It reviews how feminism has influenced perspectives on science and environment. Gender shapes science and technology, which are then used to understand and exploit natural environment. Eco-feminism is one of the major feminist perspectives to be dealt with in this course.

- **Philosophy of Science and Technology (3)**

The course introduces the philosophical views on science and technology. Logical positivism, Popper and Kuhn are compared in terms of their differing perspectives on science. It also examines the debate between realism and constructivism. With regard to philosophy of technology, this course reviews major thinkers such as Marx, Heidegger, Mumford, Habermas, Foucault and Winner.

- **Science, Technology and the Third World (3)**

The course examines the characteristics of the Third World development of science and technology and its differences from those of developed countries. It critically examines the causes of the dependency of non-Western countries on Western countries in science and technology. This leads to a deeper understanding of the implications of globalization for Third World development.

- **Studies on Technological Innovation (3)**

The course explores the processes and consequences of technological innovation and their social implications. The traditional two models of technological innovation, i. e. 'science-push' and 'demand-pull', are compared with the new interactional(or evolutionary) model in terms of their merits and demerits. As a major example of this third model, the National Innovation System(NIS) approach is introduced and critically examined.

- **Sociology of Biotechnology (3)**

This course deals with the ethical and social issues of biotechnology. It covers diverse areas of biotechnological research and applications such as GM food, transgenic animal, cloning, stem cell research, genetic testing, genetherapy and so on. Each of these areas is critically examined in terms of its risk and ethical problems. A sociological approach to deal with these issues is explored.

- **Political Ecology (3)**

The course examines the various theories and practices of ecological politics. It reviews major theories of political ecology, from environmental managerialism to deep ecology, and their implications on ecological politics and environmental movement. The practical issues like nuclear power, global warming and GMOs are also reviewed.

- **History of Science and Technology (3)**

The course introduces the historical development of science and technology. Starting from the Ancient Greek science, it mainly focuses on the so-called 'Scientific Revolution', i. e. the emergence of modern science, in the 16th and 17th century in Europe, and the subsequent developments of science and technology

worldwide.

- **Science and Technology Policy (3)**

The characteristics of science and technology policy in Korea are analyzed in a comparison with other countries. It examines how public policy on science and technology has evolved since the Second World War, from state-driven to market-oriented policies. It also explores the possibility of citizen participation in policy-making on science and technology.

- **Culture & Sports Major**

- **Introduction to Cultural Studies (3)**

It studies the formation and change of culture as a social phenomena.

- **Culture and Advertisement (3)**

This course examines the relationship between advertising and society. Using contemporary analytic theories about visual communications, we learn to analyze the complex levels of meaning in both print advertisements and TV commercials. The course will cover a wide range of topics, including sex and gender, age, advertising semiotics, representations of foreigners, and so on.

- **Research on Popular Culture (3)**

The nature and impact of mass communication in contemporary society.

- **Research on New Media (3)**

It examines the variety and characteristic of new media with the change of society. Especially this course focuses on the media as an institution that influences and is influenced by other institutions. Possible topics include: media industries as complex organizations, media influence on politics, audience reception of media content, and the implications of new media technologies.

- **Sociology of Sports (3)**

Sport becomes an important event for everyone. Topic includes the changes of sport and the impact on society. In particular, this course examines the role of play, games, and sport in society and explores how sport as an institution interacts with other institution such as business, politics, education. family, and media.

- **Sports in Korea (3)**

It studies the changes of Korean sport, the function and disfunction of sport, and the important event of Korean sport through the perspective of sociology.

- **World Sports (3)**

It studies the changes of world sport, the function and disfunction of sport, and the important event of world sport through the perspective of sociology.

- **Seminar on Sports and Culture (3)**

It examines the sport as a cultural phenomena, the impact of sport on culture, and the impact of culture on sport.

- **Understanding Postmodernism (3)**

It examines the aspects of post modernism through the eyes of sociology.

- **Seminar of Future Sports (3)**

It studies the future aspect of sport through the changes of sport organization and society.

- **Critique of Culture (3)**

It studies the changes of cultural phenomena and criticizes the meanings in modern society. In particular, it focuses on study of culture in contemporary society, and includes considerations of culture theory, values related to cultural questions, an overview of basic analysis of cultural trends.

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## Dept. of Communication

Communication is a burgeoning field increasingly influencing all of our social institutions. We believe that cultural, social, and personal experience improves through more effective understanding and practice of communication. Our program is developed to understand various issues and phenomena regarding communication. Our courses explore the theory behind contemporary mass communications and telecommunications including their origins, structures and implications for our society.

Our program is designed for students whose interests in communications are focused on broad issues involving communication studies, advertising, public relations, journalism, and new media. Our courses seek to understand communication and to improve its practice in theories and methodologies to better explain, predict and control over various communication phenomena.

### ☐ Communication Major

The communication major focuses on understanding of various media including newspapers, magazines, TV, CATV, satellite TV, Internet, etc. It prepares students for varied and long-term careers in areas such as newspaper, magazine, broadcast and online journalism. Moreover, it prepares students for lifelong learning beyond their job by teaching them to be active participants in society who can critically consume as well as produce media content.

### ☐ Advertising Major

The advertising major is designed to provide knowledge of principles basic to all advertising, marketing and persuasive communication through the courses in the creative, media, management, consumer behavior and research areas, in order to ensure the richest possible background for the advertising. It prepares students for advertising and marketing related positions and to develop analytical skills.

### ☐ Courses

#### ☐ Core Courses

##### • **Communication Theories (3)**

Introduction to theoretical orientations and research findings relevant to communication studies.

##### • **Communication Research Methods (3)**

Seminar on communication research methods such as content analysis, experiments, survey, research, historical and legal methodology.

- **Communication Statistics (3)**

Seminar on intermediate or advanced level communication research methods.

- **Theories in Advertising (3)**

Examination and analysis of communication theories relevant to the study of advertising.

- **Speech Communication (3)**

This class investigates communication processes as they occur within and among individuals, groups, organizations, and societies. will be on subjects such as group and organizational communication, language development, the practice of rhetoric and public argument, and related topics.

- **Advertising Research Methodology (3)**

To study marketing survey method accordingly with marketing theory.

- **Independent Study (3)**

Professor and student independently study more in detail and perfectly about specific field.

- **Multivariate Statistics (3)**

This course covers statistical methods analysis independent variable and dependent variable simultaneously as an extended form of existing unitary and dualistic analysis methods. Also dealing with multiple regression analysis, discriminant analysis, factor analysis, multi-variate analysis and cluster analysis and so on.

❑ **Communication Major**

- **Human Being and Communication (3) (3)**

Understanding human symbolic processes and examining various principles and practices of effective oral communication in both interpersonal and public contexts.

- **Theories in Broadcasting (3)**

Examining the theoretical bases on broadcast organization, human resource, production and social

- **Media and Public Opinion (3)**

Seminar on specialized topics concerning the relationships among public opinion, mass media, and politics.

- **New Media Theory (3)**

Topics include various problems of the new media such as concept, characteristics, formation, developments, role of information technologies in society, and current issues.

- **Research on Media Industry (3)**

Topics include economic, managerial, and policy aspects of the media industries and the network infrastructures that support them.

- **Audience Analysis (3)**

Examining fundamental principles of audience research and understanding existing theoretical approaches and methodologies.

- **Journalism Theory (3)**

Examination of structure, functions, ethics, and performance of communication and mass media, stressing a review of pertinent journalism research literature.

- **Political Communication (3)**

Research and analysis of political communication and government-media relations. Emphasis on reporting on government, elections, and political parties and other areas of general public interest.

- **International Communication (3)**

International Communication explores following areas: international news and information flow patterns, nature of international news; barriers to free news flow, comparative studies of the foreign press, and related topics.

- **Comparative Communication (3)**

Comparative analysis of international or intercultural communication behaviors and media systems.

- **Persuasion (3)**

Examining theoretical approaches concerning persuasive process in communication and advertising.

- **Topics in Communication (3)**

Topical course dealing with mass media subjects from semester to semester.



- **Topics in Mass Media (3)**

Topical course dealing with mass media subjects from semester to semester.

- **Critical Communication (3)**

This class seeks to analyze and describe communication as a social and cultural process. It will promote critical reflection on the requirements of a more democratic culture by giving attention to subjects such as gender, polity, public sphere, nation, and environment in our society.

- **Digital Society and Understanding Each Other (3)**

This course tries to enhance the understanding of new information technologies, focusing on their social impacts in the information society.

- **Media Sociology (3)**

This course devotes most emphasis to news and information production, from the different perspectives: journalist, news organization, society, culture.

- **History of Media Culture (3)**

Analysing the relationship between the society generated by the media and communication from the history of media culture. To achieve this, the course tries to understand diachronically how a development of newspapers, radio, broadcast, magazine and internet has been affected on the society.

- **Media Psychology (3)**

Analysing what we pursue through media, characteristics of each genre of media, and what mental process occurs with the unique connection between each genre with social psychology in-depth. Furthermore, the course covers the new media trends including the media convergence phenomenon, the internet, the mobile phone, the social media such as Twitter and Facebook, and the media art a nexus between the digital media and the art.

- **Media and Journalism History in Korea (3)**

This course focuses on periodical characteristics of journalism and mass media in Korean history since the late 19th century. Various aspects of the Korean media would be introduced and discussed, including media role and influence, social and economic situations, regulatory measures and institutional change. Changing the public's view of journalism and media in Korea would also be discussed.

- **CMC, Computer-Mediated Communication (3)**

This course deals with the newest types of mediated communication including computer-mediated communication and other similar forms of ubiquitous digital communication. Students learn to analyze how these new forms of mediated communication

are different from traditional context of communication under various conditions such as intra- and inter-personal interactions, group-level and more macro-level situations; and, how and why CMC leads to certain directions of individual and social effects.

- **Studies in Cross-Media and Multiple Media Use (3)**

This course reviews several recent changes in communication studies especially given the recent newly developing media environment, focusing on multiple media, multiple channels, and media convergence. Students research how audience's changing habits in multiple media and cross-media uses can relate to media contents and genre uses in both theoretical and analytic levels, consequently incorporating media literacy issues in contemporary media environment.

- **Social Media and Social Network Analysis (3)**

Social media typified as Facebook and Twitter have permeated our life, exerting influence on various aspects such as communication process, interpersonal relationship, privacy, social movement, marketing, and globalization. This growing influence is based on the underlying dynamic that social media are closely related to forming networks among individuals. The present course introduces a methodological approach to analyze social networks as well as a theoretical/conceptual discussion on the aforementioned aspects. The goal of this course is to provide better understanding of social and communication phenomena with regard to the use of social media.

- **Network Society and the Flow of Information (3)**

Along with the development of digital technologies, the flow of information and content is changing in both domestic and international settings. This course discusses how the flow of information has changed, what consequences this change has prompted, and what policy alternatives can facilitate the flow of information in our society. We will address these questions from socio-political, cultural, technological, and regulatory perspectives.

- Advertising Major

- **Psychology in Advertising (3)**

Examining the basic underlying processes of selective attention, perception, learning, and memory concerning advertising information.

- **Advertising and New Media (3)**

Examining the impact of new media on advertising and other areas of general interest.

- **Topics in Advertising (3)**

Topical course dealing with advertising subjects from semester to semester.

Examining case studies on strategic brand building in both advertising and marketing.

- **Brand Communication (3)**

The importance of brand is embossed advertisement and marketing field by parity phenomenon between goods. To learn strategy theory for effective brand building and to acquire knowledge through deep case study.

- **Theories of Advertising Effects (3)**

To learn theories related to advertising effects on consumers and explore how to measure advertising effectiveness.

- **Advertising and Media Strategy (3)**

To explore strategies related to media planning as well as the relationship between advertising and media.

- **International Advertising (3)**

To study the managerial, economic, legal, and cultural aspects of multinational advertising.

- **Advertising Creativity (3)**

To examine the process of developing creative concepts and their effective execution.

- **Advertising Strategy (3)**

To introduce to various strategies of observing and interpreting consumer behavior for the purpose of integrating consumer point of view into the creative strategy for advertising.

- **Public Relations Strategy (3)**

To explore systematic access method for relevant PR theory and PR plan.

- **Consumer Behavior (3)**

Examination of various behavioralism approaches explaining motivations, information processing and consumption behavior of consumers. Furthermore, this course covers psychological and sociological factors have significant effects on consumer behavior.

- **Marketing Communication (3)**

To broaden understanding of the new academic field utilizing various marketing

communication method such as not only advertising but also public relations, sales promotion, event and sponsorship by in-depth studying on issues related to marketing communication.

- **PR Seminar (3)**

To extend the overall understanding of public relations through in-depth course of certain topics in the field of public relations.

- **Crisis Management (3)**

The course covers topics related with two interrelated fields, issue management and crisis management. The issue management field includes a series of process such as understanding the issue, analysis, choose the strategy, practice of the program and evaluation, and this field is on the basis of analysis of organization's structure and function, and issues about society, economy, politics and environment affect on countermeasures. The crisis management field includes a series of process of building pre and after management toward the crisis situation the organization encounters such as system preparation for the crisis, detailed arrangement and crisis management.

- **Public Campaign (3)**

This course is designed to teach students how sophisticated public campaigns are planned and executed. This course will cover topics such as how attitudes are changed, how opinions are created, and how behaviors are triggered on a mass scale through carefully orchestrated communication campaigns. This course will also teach students how to evaluate and design effective public communication campaigns.

- **Health Communication (3)**

This course introduces students to theories and research about the role that communication plays in health behavior change programs and provides training in the skills students will need to be a professional health communicator. This course focuses on the health communication planning process and explores alternative planning models and theories used to design communication interventions. This course will cover research on specific topics relevant to health communication, such as entertainment education, media advocacy, multicultural audiences, new technologies, and health literacy.

- **Account Planning (3)**

Account planners are the voice of the consumer within ad agencies. They constitute the crucial link between client objectives, account management, and the creative development team, and also the media planning team. Account planners are

strategists that are particularly attuned to the emotions and thoughts of the target audiences of advertising messages. The purpose of this course is to help you better understand concepts that managers must comprehend.

#### **·Services Advertising (3)**

The main objectives of this course are to focus on the unique challenges of marketing services and advertising quality service to customers. The attraction, retention, and building of strong customer relationships through quality service and services are at the heart of the course content. The course is equally applicable to organizations whose core product is service (e.g., banks, transportation companies, hotels, hospitals, educational institutions, professional services, telecommunication, etc.) and to organizations that depend on service excellence for competitive advantage (e.g., high technology manufacturers, automotive, industrial products, etc.).

#### **·Advertising Ethics and Public Policy (3)**

Advertising Ethics and Public Policy allows students to supplement their major field with in-depth knowledge of one or more relevant areas of advertising. The course provides valuable insights into the advertising-government interface and the development of ethics and public policy affecting the marketplace and consumer culture. It also enhances students' knowledge and skills in practical areas directly relevant to advertising activities.

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## **Dept. of International Area Studies**

Department of International Area Studies seeks to produce area specialists capable of responding to the challenges of the global age by systematically linking an array of disciplines for the study of Northeast Asia. Students can tailor their course work to their academic and professional interests in accordance with their respective fields of concentration: China, Russia, Japan, or the entire northeast Asian region. Graduates have earned some of the finest accolades for their academic prowess and have moved on to advanced graduate programs and various lines of work. Sustained by major funding sources, the Department's three research arms (Center for Interdisciplinary Research on China, Institute of Eurasian Studies, and Institute of Japanese Studies) all have won critical acclaim as the foremost centers of research for their respective fields. Ranging from the most literary of the humanities to the most practical of business management, the faculty's diverse research interests reflect the Department's commitment to all-round education in area studies.

### **❑ International • Northeast Asian Studies Major**

The Northeast Asian International Area Studies Major offers a Ph.D. and M.A. program with an interdisciplinary approach to the history, politics, economics, and international relations of East Asia (e.g., China, Japan, and Russia) and a particular emphasis on comparative study. The department provides interdisciplinary training through intensive exposure to the politics, international relations, modern history, culture and society of the Northeast Asian region as a whole. Programs provided by the department are designed for those wishing to pursue a career as a Northeast Asian area specialist in various fields such as diplomatic services, business sectors, and journalism.

### **❑ Russian Area Studies Major**

Russian Area Studies Major offers a wide range of courses on politics, economics, sociology, history, and culture studies of Russia. The department also provides students with the opportunity to take part in international exchange programs in partnership with prominent universities in Russia. Through these interdisciplinary courses, the department is designed to train students to become Russian area specialists as diplomats, businessmen, journalists, and scholars.

## ❑ Chinese Area Studies Major

Chinese Area Studies enables students to focus on “China” as a particular field of specialization. Chinese Area Studies provides a broad understanding of Chinese society, history and culture, economic and political development, contemporary issues as well as the scale of China’s current and expected impact on the world economy and international relations.

## ❑ Japanese Area Studies Major

Students majoring in Japanese Area Studies are expected to be proficient in the Japanese language and to learn about various aspects of Japan. Course offerings are designed to give students a multidisciplinary overview of Japan's politics, society, economy, history, and culture. Issues in Japanese studies are bound to be sharply divisive; students are trained to keep those issues in perspective through rigorous critique of the latest media coverage as well as scholarly research on Japan. Recent graduates' career paths include foreign service, international trade, government think tanks, and further academic training abroad.

## ❑ Courses

### ❑ Core Courses

#### • **International Political Economy (3)**

A study of relationships between international and domestic politics and international economy.

#### • **Theories in International Politics (3)**

This course is designed to introduce students to the major concepts and theories of the field. Topics include the development of international relations theory, decision making models, international crisis, psychological explanations of international behavior, theories of arms races, balance of power and alliances, deterrence, war and systems theory, and constructivism.

#### • **Theory of Economic Development (3)**

This course focuses on the determinants of economic development. It examines the way socio-political factors influence poverty and economic growth, and how economic factors, in turn, shape the political institutions and trajectories of nation.

#### • **Theory and Practice in Qualitative Research Methods in Area Studies (3)**

This course is designed to introduce students to the history and practices of the



qualitative research methodology. Topics consist of the methods of official and unofficial interviews, 'outside in' and 'inside out' investigations of social organization, transcription of individual oral history, and ethnological survey.

- **Quantitative Research Methods in Area Studies (3)**

This course provides a comprehensive introduction to the principal research methods employed in international area studies. It examines quantitative research designs, empirical methods of data collection and interpretation, and measurement issues in research; it explores the progression from the conceptual and theoretical building blocks of the research process to data analysis and computer applications.

- **A Study on Thesis writing (3)**

This course aims at introducing students with statistical methodologies adopted in area studies. The course will help students to understand the interactions among statisticians and social scientists in area studies. Topics consist of statistical inference, multivariate analysis, design of experiments, sampling theory, regression analysis, and time series, etc.

- International . Northeast Asian Area Studies Major

- **Democratization and Economic Development in East Asia (3)**

During the Cold War era, Russia, China, and Japan respectively sought for state centered economic development under different political systems. This course will examine and compare different roles of the state in the process of industrialization, and further probe the changing patterns of the state's role in the era of political democratization and globalization.

- **Comparative Studies of Social Organizations in East Asia (3)**

This course aims at examining how traditional principles and shapes of social organizations have endured and/or undergone transformations in the process of modernization in each of Northeast Asian countries.

- **Comparative Economies in East Asia (3)**

During the modernization period, each of the countries in the Northeast Asian region formulated and developed different economic systems respectively. From the comparative perspective, this course deals with how those different economic systems came into existence, have been managed, and underwent transformations.

- **Industrial East Asia and Environmental Issues (3)**

Since industrialization brings about environmental issues and the latter are internationalized, environmental cooperation among East Asian countries has been recently placed as an important agenda. This course introduces students to

traditional views on natural environments, current environmental conditions, environmental policies in each of Northeast Asian countries, and methods of environmental preservation.

- **Tradition and Modernity in East Asia (3)**

Since the mid 19th century East Asia shared the experience of "enforced" modernization and westernization. Later on, the issues of tradition and modernity in East Asian society have been a focal point in discourses on modernization in the region. From this point of view, the impact of modernization on tradition and the implications of tradition in the modern society will be explored in this course.

- **Comparative Study of East Asian Cultures (3)**

The course explores the various cultural features of Korea, China, and Japan, covering each region's traditions and modern developments from comparative perspectives. The course also introduces the major cultural characteristics of North Korea, Taiwan, Hong Kong. And it examines the impact of Western ideas on modern and post-modern East Asian societies as well. Audio-visual materials (academic films, websites and photos) complement the lectures and discussions in order to illustrate these various cultural aspects of East Asia.

- **Modernization and State Building in East Asia (3)**

This course compares different paths that each of East Asian countries has taken in formulating and developing the state in the process of modernization. And the problems and characteristics which were raised in the process of state building in East Asian countries will be analyzed as well.

- **Political Economy of Systemic Transformation in Socialist Countries (3)**

Marketization reform in the former communist countries accompanies numerous problems including severe social conflicts, political struggle and, governability problems. This course deals with a wide range of social, political and economic problems in the process of post communist systemic transformation.

- **Globalization and East Asian Challenge (3)**

During the second half of the 20th century, East Asian countries were engaged in building nation states and pushing for industrialization, which had been evaluated quite successful up until the 1980s. And the so called "Asian values" which had been believed to be a driving force in the East Asian miracle all of sudden came under skepticism when the globalization phenomenon became dominant in the 1990s.. From this point of view, the course deals with each country's efforts for coping with such challenges including the building up of a regional cooperative community in East Asia.

❑ Russian Area Studies Major

• **Russia in Systemic Transition (3)**

This course surveys the structural problems of Soviet regime while focusing on the background of perestroika and its process, and offers comprehensive overview of transition to a market economy, which is a lengthy process comprised of various aspects of political and economic activities. This course will also deal with the contemporary issues and events relating to transition.

• **Reforms and Political Issues in the Post-Communist Russia (3)**

This course offers an overview of the post communist transformation in Russia. Lectures introduce students to historical and theoretical perspectives as well as current empirical studies to address topics such as post communist transition, democratization and democratic consolidation, institutionalization of political society, politics of economic reforms, civil society, and nationalism.

• **Federalism and Local Politics in Russia (3)**

Russia occupied a land mass with its 88 regions (oblasts). Since the breakup of the Soviet Union in late 1991, the Russia has experienced a process of rapid decentralization. The collapse of the communist systems necessitated the creation of new public and economic institutions in both the center and the periphery. The course reviews detailed process of mechanism and institutional characteristics of federalism, and interaction between central and local governments.

• **Marketization and the Russian Economy (3)**

This course allows students to examine the economic system of Russia, economic reforms and prospects for future changes. Students will cover issues such as the historical transformation of the economy, inflation and stabilization policy in the reform process, privatization, problems of foreign debt, foreign economic relations and prospects for the future.

• **Foreign Policy of Russia (3)**

This course is designed to examine the formulation, implementation and major issues of Russian foreign policy. A historical analysis of various aspects of foreign policy is provided, with a particular emphasis on important issues and events in the post Cold War era.

• **Seminar in Russian Studies (3)**

This seminar course provides methodologies and theories useful for those who are writing his or her M.A or Ph.D dissertation. Each student will be encouraged to relate such research tasks with the theme of his/her own thesis.

- **Readings in Russian (3)**

The objective of this course is to improve reading skills in Russian, with various kinds of articles and commentaries on politics, economics, and social trends from available sources such as newspapers and web site.

- **Culture and Society in Contemporary Russia (3)**

This course seeks to provide an anthropological understanding of Russian societies. Focus is placed on various aspects of cultural ideas and practices in relation to politics and history. Through this course, students examine complex interactions between traditional cultural systems and modernizing forces, such as western standards, nation building processes and capitalistic development. Cultural diversity within Russian society is explained through historical and comparative perspectives.

- **Russian Financial Markets (3)**

In this course, the students will study Russian financial market in the rapidly changing era of global finance. To this end, it analyzes the relationship between the economic growth and the monetary and financial policy in Russia. It also explores the specificities of Russian banking system. In addition, the course provides an in-depth analysis on the potentiality of Russian financial market by studying Russian stock and insurance markets.

- **Russia and the Korean Peninsula (3)**

This course aims at understanding the current Korean Peninsula-Russia relations both historically and structurally, and building the capacity to design the desirable form of the future relationship between the two countries. Various issues will be analyzed thoroughly such as the Soviet intervention, the debates surrounding the colonial modernization theory and the political, economic, social, cultural structures and problems of the Korean Peninsula-Russia relations since the collapse of USSR. Based on such analysis, desirable policy alternatives will be examined through the course.

- **Russian Society in Transition (3)**

The purpose of this course is to trace the impact of the economic recession and political turmoil in contemporary Russian society. Students will analyze changes since the USSR has collapsed. It will especially focus on changes after perestroika, such as class stratification, population movement and growth. In addition, welfare systems, gender stratification and women's issues, and problems of environment and education will be covered as well. By analyzing Russian society in the context of radical transformation, this course works to understand characteristics of Russian

society and directions of future changes.

- **Industrial Policy in Russia (3)**

This course deals with various policy mechanisms that governments can choose in the face of market imperfection, from economic regulation of natural monopolies to anti-trust regulation to more interventionist industrial policy to non-market solutions such as state owned enterprises. Theories as well as real life case studies and other empirical studies will be covered. This course aims at giving students an opportunity to learn how the Russian government coped with market imperfection and to apply economic theory to various market situations.

- **Contemporary Russian Political History (3)**

This course deals with general trends and major issues in Russian politics since the second half of the 20th century. In this course, students are expected to read extensive materials and discuss major issues regarding political institutions, political process, and political culture in contemporary Russia.

- **Russian NGOs (3)**

This course examines various aspects of Russian NGOs that have emerged and developed in the 1990s and 2000s. These include women's NGOs, environmental NGOs, and Human Rights NGOs. A special emphasis is put on the turbulent relationship between the state and the NGO sector.

- **Russian Investment Environments (3)**

This course aims to understand the relationship between foreign investment in Russia and changes in the international investment environment. It explores the specificities of Russian market through a structural analysis of regions and industries and through an institutional study of the foreign trade and the tax system. By studying Russian patterns of consumption, circulation market, business cultures, the course helps students to acquire practical skills required for business in Russia.

❑ Chinese Area Studies Major

- **Modern Chinese Intellectual History (3)**

This course examines China's intellectual development from the nineteenth to the end of the twentieth century, focusing on the major Chinese thinkers as well as the political figures who have influenced China's modern history.

- **Democratization and Political Development in China (3)**

This course analyzes the political development of China since the revolution in 1949, including the dominant ideology, mass-elite relations, policy processes, political institutions, economic development strategies, and historical antecedents of

the revolution. The last section of the course focuses on the reforms of the post-Mao period and considers the prospects for democratization in China.

- **Formation of Unified Empire in China and its Structure (3)**

This course covers the myth and reality of a unified empire throughout 5000 years of Chinese history with concentrated focus on periods and dynasties of ancient China. The approach adopted stresses both the unique features of China's civilization as well as its interconnectedness with the outside world.

- **Chinese National Innovation System (3)**

The aim of this course is to examine the role of science and innovation in fostering economic growth in China, emerging as a major player in scientific and technological as well as industrial research fields.

- **Contemporary Chinese Economy (3)**

Since the Reform and Open-door policy China has experienced dramatic changes including rapid economic growth. This course covers various developmental issues in contemporary China. Causes and consequences of the Chinese rapid economic growth will be discussed with reference to economic theories. From this course, students might also draw practical implications for the developing world.

- **Industrial Policy Industrial Structure in China (3)**

An effective industrial policy is essential for any government to timely respond to the fluctuations of market forces and to ensure the competency, productivity, and effectiveness of industry. Especially in order to fully realize the transformation and reform of industrial structure, the role of state is ever more crucial. Analyzing the direction and contents of industrial policies that the current Chinese government has been pursuing will be examined throughout the course.

- **Seminar in Chinese Studies (3)**

This seminar is centered around a special topic on China, which will be carefully chosen by the professor reflecting the students' demand.

- **Culture and Society in Contemporary China (3)**

This course aims to comprehensive understanding of Chinese society and culture in general. Particularly modern transformation of Chinese culture, its inner diversity and the conflicts innate in modern Chinese society will be more discussed. Especially the relationship between culture and power, family and marriage, sexual discrimination, social inequality, mass culture and mass mobilization will be analyzed on the basis of social scientific discipline.

- **Chinese Foreign Policy (3)**

The principles, the patterns of changing, the decision making process of the foreign policies of China will be studied throughout this course. In addition to these, by exploring the place of China in the northeastern Asian order, the means of establishing international structure conducive to resolving the north south Korean confrontation will be more discussed.

- **China and the Korean Peninsular (3)**

The Korean peninsula had been invaded by neighboring foreign powers. To overcome the current division of the Korean peninsula, the support of these neighboring powers is still inevitable. This class will investigate Chinese interests in the Korean peninsula and its policies on that, especially in the framework of international politics.

- **Chinese Women and Modernization (3)**

Modernization, accompanied by industrialization and urbanization, resulted in the separation of home from the working place, the introduction of modern education, the fundamental changes in family, kinship, and marriage structures. To this process of modernization, how women have reacted, resisted and succumbed will be discussed. Also in the meanwhile, the examination will be furthered into the topics of formulation and changes of gender and sexuality in modern Chinese society in general.

- **Chinese Revolution and Modern State (3)**

This class explores the unique development of Chinese modern state building and her socialist revolution. It covers the period of 1842-1949, starting from the Opium war when China was reluctantly driven into the world capitalist system and ending with the establishment of People's Republic of China in 1949. The students will learn how the various ideas of modern state were conceived and competed among the different social groups of China such as the Communist leaders, intellectuals, workers, peasants, and women. More is to be illuminated about the ways of those conflicting conceptions of modern state being reflected and distorted in the socialist revolution.

- **Methods of Chinese Politics (3)**

Here will be introduced major theories of social sciences that may be helpful for understanding Chinese politics and society, respectively focusing on traditional society, socialist planning system, and economic reform. Concerning the traditional society will be discussed such Western views as Hegelian perception of Chinese civilization, oriental despotism, and Asiatic mode of production and such Chinese analyses as theory of germination of nascent capitalism in China, systemic analysis of history by Jin Kuantao, theory of basic structure of Chinese society by Fei Xiaotong, psychological analysis of Chinese people by Lin Yutang. Concerning the

socialist system will be discussed totalitarianism, factionalism, cultural analysis, two lines ideology struggle. For the politics after economic reform will be discussed policy implementation theory, neo authoritarianism, corporatism, civil society, state theory etc.

- **Geography and Network of Knowledge in China (3)**

Knowledge has been unmistakably recognized as the crucial infrastructure of the information society in the 21st century, affecting all areas of economy, culture, politics, etc. This class will examine what are the features of the knowledge system in China and how it is operated. By analyzing the process of producing and consuming knowledges in Chinese society the students will draw a map of knowledge networks of China.

- **Business Enterprises in China (3)**

Business enterprises constitute a key part of an economy. This course examines various groups of firms in contemporary China, including state-owned enterprises, indigenous private firms, and foreign-invested firms. Behavioral characteristics of each group and the Chinese business ecosystem as a whole will be discussed.

□ Japanese Area Studies Major

- **Modern Japanese History (3)**

This course deals with contentious issues in Japanese history that tend to receive biased treatments in the media. Students are expected to read an array of primary and secondary material in order to approach those issues with dispassion and, in so doing, see how well their preconceived notions hold up in making sense of changes and continuities in Japanese history.

- **Japanese Women and Modernization (3)**

This course introduces gender issues and women's role in the context of Japan's modernization. Students will review aspects of discrimination in traditional Japanese society and analyze changes in the role of Japanese women in the postwar period.

- **State and Politics in Modern Japan (3)**

This course offers an overview of the postwar politics of Japan. Theoretical perspectives will be examined against recent empirical studies to address a wide range of topics: political thoughts, party politics, factionalism, economic reforms, civil society, and nationalism.

- **Local Politics and Decentralization of Power in Japan (3)**

This course focuses on the tension between centralization and decentralization in contemporary Japan. Emphasis is on resource allocation and local politics.



- **Economy and Society in Contemporary Japan (3)**

This course examines the economic structure and business practices of contemporary Japan. Students are expected to explore diverse dimensions of Japanese economy after the Second World War, origins and consequences of the bubble burst, and structural reforms in recent years.

- **Foreign Policy of Japan (3)**

This course surveys formulation and implementation of Japanese foreign policy. Emphasis is on Korea-Japan relations in the post-Cold War era.

- **Seminar in Japan Studies (3)**

This seminar is intended to familiarize students with theories and methodologies in recent scholarship on Japan. Those at the stage of writing graduation theses will periodically make progress reports and share their work with fellow students.

- **Readings in Japanese (3)**

This seminar will be organized on an ad hoc basis to have students read closely Japanese source material, scholarly as well as journalistic, on topics chosen by the instructor.

- **Religion and Folk Beliefs in Contemporary Japan (3)**

The course surveys religions of Japan, traditional and contemporary, and examines the religious underpinnings of Japanese social fabric.

- **Korea-Japan Relations: Past and Future (3)**

This course examines thorny issues in Korea-Japan relations and explores ways to manage, if not resolve, those issues.

- **Culture and Society in Contemporary Japan (3)**

This course takes an anthropological approach to issues in Japanese culture and society. Topics include family and marriage, gender, and popular movements.

- **Japan's Industrial Policy in the Information Age (3)**

This course examines the longstanding assessments, theoretical and empirical, of Japan's industrial policy and its role amid the challenges of the information age.

- **Center and Periphery in Modern Japanese Society (3)**

This course reviews the role of the government in modern Japan and seeks to put its impact in perspective by probing the dynamics of societal trends and various facets of interplay in state-society relations.

- **Modern Japanese Society from Within and Without (3)**

This course is designed to help students understand Japanese patterns of behavior. Topics include stereotypes and ethnographic descriptions produced by Japanese and non-Japanese observers. Emphasis is on native Japanese efforts to construct particular cultural identities.

- **Political Economy of Japan (3)**

This course examines the rise and transformation of contemporary Japanese economic system and its relations with the postwar Japanese political system. After reviewing the years of rapid economic growth in postwar Japan, students will investigate the causes and effects of the long recession since the 1990s. Reading material will also include discourses on restructuring Japan's political economic system in the post-growth era.

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## Dept. of Law

The Department of Law offers a wide range of postgraduate courses which are designed to deepen and refine the legal knowledge learned at undergraduate level. Admission to the postgraduate programme is based solely on academic merit. The LLM and LLD courses may begin either in March or in September. Most courses are done in combination of weekly seminars and lectures of three hours of duration. The postgraduate courses are further divided into nine major subjects, which are Legal Philosophy, Constitutional Law, North Korean Law, Administrative Law, International Law, Criminal Law, Civil Law, Commercial Law, Social and Economic Law.

### ☐ Courses

- **Studies on Legal Philosophy (3)**

This class studies the subject matters such as, validity and idea of law and tries to present direction of the positive law.

- **Studies on History of Legal Thoughts (3)**

This class focuses on the origins of legal thoughts and especially on correlation between legal thoughts and the political, economical and social factors.

- **Studies on Methodology of Jurisprudence (3)**

This seminar aims at elucidating the scientific character of jurisprudence and its objects and specializes in the variety of method on how the legal norm should be found and founded.

- **General Theory of Constitutional Law (3)**

This course surveys general theory of the constitutional law, its meaning and features, its enactment and amendment, its basic principles, protection of fundamental rights and the organization of the administration.

- **General Theory of Administrative Law (3)**

This course aims to study the subject of public law and the legal mechanism where the rule of law is realized in modern public administration.

- **General Theory of International Law (3)**

As rules forming and governing international society, international law of peace and war will be examined under this heading. This subject also helps students to deal with the essential issues of international law and perceive its importance.

- **General Theory of Criminal Law (3)**

General Theories of Criminal Law is to take a look at general theories relating to the meaning and features of criminal law such as, criminal procedure, criminal policies and prison administration law, and to research in modern tasks of criminal law and new measures with changes in society.

- **General Theory of Civil Law (3)**

This course is designed to give students an understanding of the basic principles and theories of Civil Law. The practical theories of Civil Law intertwined with case verdicts aim to give students distinct comprehension of the origins of Civil Law.

- **General Theory of Commercial Law (3)**

The aim of this subject is to enable students to comprehend the general theories on the Korean commercial law comprised mainly of the business trade, corporate system, securities, insurance and maritime law. In this course, the students will research how commercial legislations of other countries are applied in Korea.

- **General Theory of Social Law (3)**

This course aims to study history of labor law, social security law and economic law and then to abstract the complex general principles based on the special character of social law.

- **General Theory of North Korean Law (3)**

This course treats to study the history, characteristics and articles of North Korean Law, and to discuss general contents of North Korea's Legislation based on the socialist legal principle through analyzing the systematic classification and characteristics of North Korean Laws including constitution, civil code, criminal code, etc. Moreover, to analyze a legal theory of North Korea based on the so called Juche idea.

- **General Studies on Legal Systems of Unified Korea (3)**

To search the legal suggestions through the unifying process of divided country & examine legal issues according to the unifying development processes between South and North Korea related to the legal suggestions. Also, to study problems and the preparations for unification.

- **General Theory of Information and Communication Law (3)**

Rapid progress in the Internet and Information & Communication Technology has come to create a new area of law, Information & Communication Law, through adding information property to the existing concept of property legally. The area of law will play a great part in the information era, as it is expected to create a high value in the world, bring social changes into the information industry. Those students who have interests in information security or intend to start up their own

businesses would actively discuss in this class.

- **General Theory of Tax Law (3)**

This course will study principles of tax laws such as individual income tax, corporate income tax, estate and gift tax and value added tax.

- **General Theories of the Financial Law (3)**

Nowadays, almost all financial institutions worldwide are adopting universal banking model. That is, thick walls between banks and either security firms or insurance companies are breaking down, and the unique characteristics of these financial institutions disappearing. This class aims at studying a new trend in the financial world and looking for the best way to enhance the competitiveness of the Korean financial industry.

- **General Theory of Public law (3)**

This course concentrates on the general theory and structure of Constitutional Law, Administrative Law, Criminal Law, International Law, North Korean Laws and Information and Telecommunication Law, etc. which provides the relationship of the national, governmental and national relationship, relationship of State and public organization, relationship between nation and individual, etc.

credits upon completion of this course as an undergraduate student will be applied toward the student at the graduate school level, if applicable.

- **General Theory of Private law (3)**

This lecture takes a look at a general theory of private law field including the Civil law, commercial law, financial law which is included the principle of faith and diligence, prohibition of the abuse of rights and others.

This course can be taken by undergraduate students as well as graduated students. credits upon completion of this course as an undergraduate student will be applied toward the student at the graduate school level, if applicable.

- **General Theory of Jurisprudence & Society and Economy Law (3)**

This course examines the basic theory of law and the general theory about the system and structure of society and economy law. Jurisprudence includes subjects such as philosophy of law, sociology of law and legal history and society and economy law includes subjects such as social law and tax law.

credits upon completion of this course as an undergraduate student will be applied toward the student at the graduate school level, if applicable.

❑ Law Major

- Jurisprudence Field

- **Advanced Studies on Legal Philosophy (3)**

This advanced seminar treats the core subjects of legal philosophy such as the essence of law, the relation between law and morals, relation between law and state.

- **Studies on Anglo-American Law (3)**

This seminar treats the Anglo American legal system and compares it with the continental legal system.

- **Studies on European History of Law (3)**

This seminar aims at studying the history of western legal systems including German law which has exerted an important effect upon the Korean legal system.

- **Law and Economics (3)**

This seminar aims to analyze journals, research methodology, and cases of Law and Economics including property rights, Code of Misconduct, contract law, etc.

- **Studies on Korean History of Law (3)**

This seminar treats the background and analyzes relation between Korean law in each epoch and political, economical, social and cultural circumstance.

- **Comparative Legal Studies (3)**

This seminar compares the characteristics of the major legal systems in the world and finds the common principles of legal systems.

- **Studies on Sociology of Law (3)**

This seminar aims to study the relation between law and society, namely, effect of law on society, influence of social factors on legislation and judicature.

- **Legal Ethics (3)**

This seminar treats ethical problems of legal professionals and surveys the cases against legal professionals in America and presents the ideal of legal professionals.

- **Policy Making in Law (3)**

This seminar adopts the social engineering approach and analyzes function and limit of law as a means of policy.

- **Advanced Studies of Sociology of Law (3)**

This seminar aims to study the cases on relations between law and society, namely, effect of law on society, influence of social factors on legislation and judicature.

- **Advanced Studies of Law and Policy (3)**

Based on study of Law and Policy, this seminar aims to study the cases on administrative legislation (the process of legislation, evaluation, and achievement of a policy goal).

- **Studies of Law and Creative Industry (3)**

This seminar aims to study law and policy on promotion and regulation for Culture Industry (Culture Industry Promotion Act, Contents Industry Promotion Act, Game Industry Act, Juvenile Protection Act, etc.)

- **Law and Minorities (3)**

This seminar examines the legal status of women, handicapped, sexual minorities etc. and alternative plans for improvement of rights and interests of these people.

- **Law and Politics (3)**

This seminar searches for the role of law in a diversity of political system, the political philosophical origin of, and the issue of democratic communication that is presented in process of debate and consensus.

- Constitutional Law Field

- **Studies on Basic Human Rights (3)**

This course studies formation and development of the thoughts and philosophy of human rights, history and globalization of the protection of fundamental human rights and further studies the general theory of human rights its definition and feature, effects of constitutional provisions of human rights, its boundary and limitation, and violation of human rights and its relief.

- **Studies on Theory of Sovereignty (3)**

This course includes the studies on development of the concept of sovereignty, nature and subject of sovereignty, and traditional theories of sovereignty, such as, the monarchism, the popular sovereignty, the national sovereignty, etc. and process to embody the principles of the national sovereignty under the Korean Constitution in details.

- **Studies on Constitutional Review System (3)**

The purpose of this course is to study the meaning, history, theoretical basis and its limitation, and types of constitutional review system and oversee development of constitutional review system and the constitutional review system under the Korean Constitution.



- **Advanced Studies on Constitutional Law (3)**

This course is an advanced study of important theories of the constitutional law. Especially, this course focuses on the selected core points of various issues raised under the Korean Constitution and their supporting theories.

- **Comparative Studies on Constitutional Law (3)**

The purpose of this course is to help students understand the scope, feature and methodology of comparative studies on the constitutional laws. In addition, it requires that students conduct comparative studies on types of the constitutional law, on types of government, and on the constitutional system: and those students consider comparative studies on the constitutional laws of democratic and communist nations as well.

- **Studies on History of Constitutional Law (3)**

The purpose of this course is to survey historical development of basic concepts of the constitutional law and historical overview of the constitutional laws of the Great Britain and the United States for the English and American legal system and that of the constitutional laws of France and Germany for the continental legal system. It also outlines the history of the Korean Constitution and inquires into its development in the future.

- **Case Studies on Constitutional Law (3)**

This course studies foreign and Korean cases involving constitutional law issues mainly dealing with important cases involving the issues of the fundamental human rights. In this course students will analyze and describe foreign and Korean cases upon reviewing English, German and Japanese cases.

- **Studies on Government System (3)**

This course surveys government types appeared in the history of the Korean Constitution and reviews the organization and authorities of the government under the Korean Constitution. In addition, it compares Korean governmental organization with foreign governmental organizations.

- **Studies on Constitutional Litigation (3)**

The primary goal of this course is to study the definition, the nature and limitation, and the types of constitutional litigation and to research development of the constitutional litigation system and cases involving constitutional review, constitutional petition, jurisdictional dispute, impeachment and party dissolution, etc. under the Korean Constitution.

- **Information Society and Constitution (3)**

This course studies the concept, features and problems of information society and further studies how the constitutional sovereignty concept, freedom of the press and privacy protection can be influenced by the advance of information society. It also explores the concept of the electronic government, the relationship between separation of power and parliamentary democracy.

- **Studies on Lawmaking (3)**

This course studies the meaning, nature and limitation of lawmaking to analyze and examine contents and problems involving parliament lawmaking, administrative lawmaking, and local government lawmaking in details.

- **Studies on Judicial system (3)**

This course studies the definition of judicature, differences between administration and legislation, development history of judicature, democracy and judicature, etc., and also studies judges and lawyers and problems of the Korean judicial system as well.

- **Studies on Mass Communication Law (3)**

This course examines legal matters and crimes involving the press and mass communications, such as, newspapers, broadcasts, magazines, etc, to study privacy protection, the definition and limitations of the freedom of the press (mass communications) and cases involving mass communications in leading countries and Korea.

- **Studies on Constitutional Litigation (3)**

This course is a study of the constitutional litigation to analyze and describe in depth the theories in respect to the nature and limitation, and the types of constitutional litigation and to research development of the constitutional litigation system and cases involving constitutional review, constitutional petition, jurisdictional dispute, impeachment and party dissolution, etc.

- Administrative Law Field

- **Studies on Administrative Law of Function (3)**

This seminar aims concentrically to study principle of law connected with administrative measure and relief procedure.

- **Studies on Administrative Law of Economy (3)**

This seminar aims to study principle of law for economy & function among special administrative & process act.

- **Studies on Administrative Law of Presentation (3)**

This seminar aims to study field of presentation & administration and administration of composition.

- **Studies on Law of Reparation by Government (3)**

This seminar aims to safeguard invasion of rights of the nationality for illegal administration act of the state.

- **Studies on Law of Compensation by Government (3)**

This course aims to study protection of invasion of rights of the nationality for illegal administration act of the state.

- **Studies on Administrative Procedure Law (3)**

This course aims to study an administrative procedure law and relief procedure of preventive measure.

- **Advanced Studies on Administrative Law (3)**

The purpose of this course is to study principles of law connected with administrative organization, administrative act, administrative procedure, and administrative procedure.

- **Comparative Studies on Administrative Law (3)**

This seminar aims to study comparing the history of England and American law to the continental law.

- **Case Studies on Administrative Law (3)**

Through studies, this course aims to study system of administrative law and to criticize it.

- **Studies on Environmental Law (3)**

Recently, environmental Problems began to pose serious issues in our society. Therefore this course aims to study field of environmental law among the field of public law.

- **Studies on Administrative Law of Land (3)**

This seminar aims to study system of law connected with estate administration act and local development and administrative act.

- **Studies on Law of Local self-government (3)**

This course aims to study a system of law of local autonomy & administration.

- **Theory of Administrative Act (3)**

Study on the meanings, kinds, requirements of coming into being, and faults of administrative act.

- **Studies on Administrative Law of Public Finance (3)**

Study on the legal principles of making a budget and execution of Public finance.

- **Studies on Administrative Procedure Law (3)**

Study on the legal principles and theories of administrative procedures.

- **Studies on Administrative Rulemaking (3)**

Study on the function and role of administrative rule-making in modern society.

- Information and Telecommunication Law Field

- **Studies on Broadcasting laws (3)**

As broadcasting, in modern society, has an important function as a means of information delivery as well as a media of press, students are expected to understand original principles of each area of ground wave broadcasting, satellite broadcasting, cable broadcasting, and internet broadcasting, and to contribute to set up a system facing convergence trend between broadcasting and communication.

- **General Theory of Information Law (3)**

Students are to find phenomena of law that is independently established in the course of social changes from industrial society to information society, and to understand individual positive law, and to especially make a further study of the information security.

- **Advanced Studies on Laws of Telecommunication (3)**

Laws of telecommunication that provide for use and regulations of wire and wireless communication devices as means of transmitting information, have increased their importance with development of telecommunication industry as an independent area. Students are to understand terminology of positive law related to communication, focusing on setting up the system.

- **Studies on Internet Law (3)**

Students are expected to study law phenomena that happened on the Internet which is the basis of the information era, and to find differences from principles of law in real space and to build up special principles of law.

- **Studies on International Information and Communication (3)**

This class helps students who understand international law on information & communication, to study communication related international rules including OECD guideline for protecting privacy, e-commerce model law of UNCITRAL, radio

regulation (RR) of ITU, and ICAO Convention.

- **Theory of Information and Telecommunication (3)**

To study information era requires preliminary understanding of information & communication, and students are to study concepts of information & communication, its technological advance, and its roles in modern industrial society.

- **Studies of Information Protection Laws (3)**

It is most important to protect various digital information and to install protective devices as part of realizing reasonable and true information society. It is the a key approach to the information society. Thus, students are to look into seriousness of information leakage by each case, and how to improve relevant laws.

- **Freedom of Information Theory (3)**

Information disclosure to meet the right of the public to know is a very important goal in order to establish the information society in a true sense. Students are to study why freedom of information has significant meaning in modern society, and current law system for it, with problems and countermeasures.

- **Studies on the Radio-Act (3)**

Radio wave is an important media of information and communication, and it is especially highlighted in modern society due to rapid progress of mobile communication devices and related industry. Students are to look into uses of radio wave and related regulation and try to find out development direction.

- **Studies on Telecommunications Business Act (3)**

Telecommunication Business of Korea has come to face the most critical stage due to launch of WTO system. Looking into history of telecommunication business of Korea, students are to research the changes of laws in association with telecommunication business, and to suggest an alternative idea.

- **Studies on the US Radio Act (3)**

US Radio Act serves as an important model to the world in establishing telecommunication policy and is a representative rule dividing it into policy planning agency and regulation agency. Students are to make a study of such acts and provide materials to law making policies.

- **Seminar on Information and Telecommunication Policy (3)**

As expressed in "Law is the expression of policies", developing and drafting of plans aim to be ultimately expressed in act or law. The Information and Telecommunication Industry is expected to play the most important part for promoting the national wealth and power. In particular, the information and

telecommunication area should be reviewed and analyzed from a legal point of view on each issue and policy.

- **Studies of Law and Cyberspace (3)**

To study cases and principles of independent standards for cyberspace, especially property rights, trade system, and criminal law.

- International Law Field

- **Studies on Law of International Organizations (3)**

Rules of international law on international organizations will be studied here with special reference to the United Nations.

- **Studies on Law of Treaties (3)**

This subject proposes to study the issues such as the concept, formation, effects of treaties.

- **Studies on Law of the Seas (3)**

In this traditionally important area of international law, students will study various jurisdictional areas of the sea, like the territorial sea, the high seas, the continental shelf, the exclusive economic zone and the deep seabed.

- **Studies on Law of War (3)**

This subject will deal with the general problems of war and the law and customs of war on land, in the air and at sea.

- **Studies on Law of International Conflict Resolution (3)**

This subject focuses on the rules of international law concerning the peaceful, especially the judicial, settlement of disputes between states.

- **Advanced Studies on International Law (3)**

In this subject, special problems will be selected from the traditional to the modern issues of international law and delved into.

- **Case Studies on International Law (3)**

This subject examines the jurisprudence of international tribunals through discussions on the decisions given by them.

- **Studies on International Criminal Law (3)**

With the Statute of the International Criminal Court in force, students will study individuals' criminal responsibility for the grave violations of human rights.

- **Studies on Law of State Responsibility (3)**

Examined under this heading is the responsibility of states for internationally wrongful acts.

- **Studies on International Human Rights (3)**

Students will study the status of individuals in international law and the regime for the international protection of human rights.

- **Studies on History of International Law (3)**

This subject will examine the development of international law from the historical perspectives.

- **Studies on Space Law (3)**

This subject will deal with the issues related to the development and use of the space environment.

- **Studies on International Environmental Law (3)**

This course deals with a relatively new matter of international concern, that is environmental problems. International rules and regulations concerning global and regional pollution problems such as global warming, marine pollution, air pollution and desertification will be discussed.

- **Studies on International Economic Law (3)**

This course deals with international rules and institutions governing economic relations between States. Discussions will center around WTO and issues related thereto. By taking part in the course, students will have knowledge and perspective on norms governing inter State economic activities.

- Criminal Law Field

- **Studies on Criminal Law (3)**

In these studies, academic debates on criminal law are reviewed and the various fields of criminal law, such as elements of crimes, justification, excuses, and culpability etc. are deeply investigated.

- **Studies on Criminology (3)**

Studies on Criminology provides a general concept and viewpoints of crimes and delinquency, takes a deep look into the area of criminology, theoretical history, and tries to approach crimes in the perspective of general principles on the basis of established monistic and plural theories related to causes of crimes and delinquency.

- **Studies on Penology (3)**

Studies on Penology is aimed at studying the meaning and functions of punishment and its historical changes, and focuses on the problems of modern penal system in light of crime prevention and treatment of criminals. Its purpose is also to make inquiries about possible alternatives to traditional punishments and non-penalty care and custody system.

- **Studies on Particular Criminal Law (3)**

Studies on Particular Criminal Law is designed to investigate the distinction between special and ordinary criminal law as well as the meaning and scope of application of special criminal law, and to look into the exclusion of the principles of criminal law and to make legislative and interpretational study on individual special criminal laws.

- **Studies on Law of Criminal Evidence (3)**

Studies on Criminal Evidence Law is part of law of criminal procedure, and it places importance on kinds of problems about basic principles of evidence in criminal trials, hearsay rules, exclusionary principle, confession, etc. and highlights interpretation of Code of Criminal Procedure from the point of due process of law and the humanitarian guarantees of the accused and the protection of the victims.

- **Studies on Criminal Procedure Law (3)**

Studies on Criminal Procedure Law is designed to take a look at the meaning, history, purpose, principles, and basic theories of criminal procedure, to determine major problems relating to criminal litigation and procedure, and to make legislative and interpretative study of criminal procedure law.

- **Special Studies on Criminal Law (3)**

Special Studies on Criminal Law is designed to make concentrated research of major problems of theories on actus reus, theories on culpable intent and negligence, theories on composition requisite, theories on responsibility, theories on complicity, and theories on attempted crimes.

- **Comparative Studies on Criminal Law (3)**

Studies on Comparative Criminal Law is designed to grope for the developments of Korean criminal laws by making comparative study of continental criminal laws including German, French, Japanese laws and Anglo-American laws.

- **Studies on Penal Policy (3)**

Studies on Penal Policy deals with the meaning of criminal policies, history, research methods and their modern problems, and with problems of the current



policies covering crime prevention measures, criminal treatment measures and remedies.

- **Case Studies on Criminal Law (3)**

Case Studies on Criminal Law is designed to interpret and criticize cases in criminal law by focusing on Korean Supreme Court's cases and foreign ones, to reexamine theories on criminal laws and to contribute to the proper interpretation of positive criminal laws and the legislative efforts.

- Civil Law Field

- **Studies on Property (3)**

This course handles the main issues of Chapter II of the civil code, which includes transaction of real estate, registration, ownership, servitude, security.

- **Studies on Contracts and Torts (3)**

The body of law concerned with private agreements, including the capacity to contracts, contract formation, interpretations, conditions, excuse of performance, and remedies for breach will be examined. Civil liability for breach of duty causing harm to persons or property intentionally or unintentionally, fault and no fault theories of liability and theories of analysis of causation will be studied.

- **Studies on Family Law (3)**

This course deals with the main issues on family and relatives, including, divorce, adoption etc.

- **Studies on Civil Procedure Law (3)**

The focus of this course will be : civil liabilities and civil litigation; civil procedures and actions ; and the allocation of forced performance.

- **Special Studies on Civil Law (3)**

This course deals with special issues on civil law in accordance with development of theories and cases.

- **Comparative Studies on Civil Law (3)**

This course is designed to give students a complete understanding of international conventions in comparison to German Civil Code, French Civil Code, common law and their effects on Civil Law in general.

- **Special Studies on Property Law (3)**

This course will focus on theories and practices of property law and it's related cases.

- **Special Studies on Contracts and Torts (3)**

This course focuses on the special issues of the law of obligation, which will be assessed important in theoretical and practical perspective.

- **Special Studies on Civil Procedure Law (3)**

Students will compare and contrast the recent civil litigation cases through researching civil litigation case verdicts.

- **Studies on Law of Security Rights (3)**

This course will focus on private security rights and public security rights in terms of property and finances, etc.

- **Case Studies on Law of Property and Obligation (3)**

The basic principles of civil law, property law, contracts and torts law, inheritance law, etc. and related cases will be researched in this course.

- **Studies on Property Law Cases (3)**

Property interests in real estate personal property, formation and change in circumstance, etc. and related case verdicts will be the emphasis of this course.

- **Studies on Law of Contracts (3)**

The main structure of contract law formation, interpretation, validity, breach and remedies of contract will be researched.

- **Advanced Studies on Law of Contract (3)**

The important issues of the present contract law will be researched with emphasis on recent case law of contract.

- **Studies on Law of Torts (3)**

The main structure of torts law will be researched based on the interpretation of Civil Code and trend of recent case law.

- **Advanced Study on Law of Torts (3)**

The recently developed issues of torts law will be discussed, for example, legal aspects of pollution, maltreatment and defamation etc.

- **Case Studies in Civil Law (3)**

This course will deepen the understanding of civil law by analyzing theoretically important cases of the supreme court.

- Commercial Law Field

- **Basic Studies on Commercial Law (3)**

This subject is set for helping students to understand the basic doctrine of commercial law and its various theories through analyzing the historical development of domestic commercial law as well as foreign commercial system.

- **Studies on Law of Corporation (3)**

The purpose of this course is to assist students to explore the essential principles and functions of company systems regulated in the present legal system by researching relevant legislation and its judicial precedents.

- **Studies on Law of Negotiable Instruments (3)**

The purpose of this course is to assist students to explore the essential principles and legal principles of securities, including the bill and checks, and to research how the legal theories are now applied in the commercial trade.

- **Studies on Admiralty Law (3)**

This course is intended to teach graduate students who are interested in learning the legal principles and regulations on the matters relevant to maritime undertakings and its activities including marine cases.

- **Studies on Law of Insurance (3)**

This subject is for graduate students who want to study the legal doctrines and cases on the Korean insurance laws which regulate insurance companies and their activities.

- **Advanced Studies on Commercial Law (3)**

This course is for graduate students who want to study the legal relations among diverse principles occurred in the area of corporate, insurance, damages, and securities, which could be adapted in legal practices.

- **Case Studies on Commercial Law (3)**

This course is for graduate students who want to study the judicial trend of commercial law. And this course focuses on interpreting and analyzing the Supreme Court's cases, and sometimes important lower courts' cases.

- **Studies on Law of International Commercial Trade (3)**

This course is to study legal problems and solutions on the international commercial trade by researching diverse international standards, e.g., United Nations Convention on Contracts for International Sale of Goods (CISG), and analyzing international arbitration cases.

- **Special Studies on Law of Corporation (3)**

This course is to study diverse corporation systems such as domestic and global regulations, foreign corporations, multinational undertakings, etc.

- **Special Studies on Law of Negotiable Instruments (3)**

This course is to compare and consider the original theories on the Law of Securities from the view of international treaties and abroad legal systems by focusing on the legal practice in the Securities Law.

- **Studies on the Electronic Commerce Act (3)**

With the ever fast Internet growth and development, electronic commerce is also growing. In this course, studies will include adoptions and applications of electronic signature, electronic money and other transactions on the electronic commerce.

- Financial Law Field

- **Studies on Capital Markets Act (3)**

In 2009, a new Capital Market and Financial Investment Business Act came to effect, which integrated the formerly separated act on capital markets and commercial investment. Such change is expected to trigger a growth spurt on the capital market and students will be given the opportunity to study the new Act in detail.

- **Studies on Institutional Investors and Law (3)**

Institutional investors, such as pension fund, mutual fund, life insurance and etc., have the most influential powers in the modern capital market. They are not just passive investors but are representative ones actively voicing the change of a corporate governance scheme against their counterparts. Shareholders' behaviors are emphasized in order to get the highest investment returns based on long term investment strategies. The CalPERS will be deeply analyzed as the most desirable model in the institutional investor field.

- **Study on Loan Specified Finance and Law (3)**

Loan specified finance firms are categorized to the following ones : (1) lease firms; (2) venture capitals; (3) consumer finance companies; and (4) credit card companies. When conducting these businesses, they should be careful of protecting consumers. Consumer insolvency problems will be also deeply dealt with.

- **Study on Comparative Financial Law (3)**

Historically, the Korean financial system has come from the U.S. rather than Germany or France. Thus, it may not be harmonized with other legal areas such as

civil laws, which have been traditionally modeled on the continental legal system. In particular, this class focuses on the major similarities and differences between financially advanced countries such as the U.S., the U.K and Japan. The result will clearly suggest what the problem was in the past structure and what should be done in the future financial market.

- **Studies on Corporate Mergers and Acquisitions (3)**

This course will review and discuss the economic effects and trends in corporate mergers and acquisitions. Particularly, as hostile M&A are considered a great public interest, topics will include tender offer, which is considered a main tool for hostile M&A and various defense mechanisms against hostile M&A and their legalities under the current Korean practice.

- **Studies on Corporate Finance Act (3)**

This class shall cover different areas covering finance industry, including banks, investment firms, and insurance companies etc., which may aid and assist capitalization of corporations as well as individual citizen's investment opportunities.

- **Studies on Corporate Governance (3)**

This module shall seek to promote effective and productive corporate practices by studying and discussing standard corporate practices including corporate decision structure, management and problem solving tactics based on current laws and regulations.

- Tax Law Field

- **Studies on Basic National Tax Law (3)**

This seminar will study general provisions of Basic National Tax Law.

- **Case Studies on Tax Law (3)**

This seminar will study selected cases among proclaimed judicial precedent of the Supreme Court until now since 1945.

- **Studies on Individual Income Tax (3)**

This seminar will study Individual Income Tax according to the items such as concept of income, computation of income, taxable entity and tax accounting.

- **Studies on Corporate Accounting Law (3)**

This seminar will study financial accounting issues item by item of the P/S and B/L.

- **Studies on Corporate Income Tax (3)**

This seminar will study corporate income tax on corporate transactions such as from incorporation to liquidation of a stock company.

- **Studies on Gift and Estate Tax (3)**

This seminar will study gift tax and estate tax altogether.

- **Studies on Property Taxes (3)**

This seminar will study mainly acquisition tax and registration tax, property tax and capital gains tax.

- **Studies on Consumption Taxes (3)**

This seminar will study value added tax, special excise tax, liquor tax and traffic tax relating to the consumption patterns of taxpayers.

- **Studies on Tax Litigation (3)**

This seminar will study tax disobedience procedures and tax lawsuits broadly such as tax administrative lawsuits, tax civil lawsuit, and tax constitution lawsuit.

- **Generals of International Taxation (3)**

This seminar will study main factors to determine tax jurisdictions such as residences and sources, and provisions against international double taxation and transfer pricing.

- **Studies on Tax Conventions (3)**

This seminar will study OECD model treaty, focusing mainly on the difference between OECD model treaty, UN model treaty, US model treaty and EU model treaty.

- **Studies on International Tax Avoidance (3)**

This seminar aims at researching problems such as thin capitalization, tax haven and treaty shopping.

- Social Law Field

- **Studies on Workers' Basic Rights (3)**

This course is designed to teach students the historical and ideological background of the workers' basic rights stipulated in the Constitution in order to secure the workers' right to live, the legal substance of their basic rights and the restriction and limitation of the three basic rights, especially the right to strike.

- **Studies on Labor Organizations (3)**

In this class, the history of the labor movement and the attitude of the law

toward the labor organizations are reviewed and the collective labor law about the organization and operation of labor unions is learned.

- **Studies on Collective Agreement System (3)**

The development of collective agreement system and especially the recognition of its legal normative character in various countries are to be reviewed and the realities of collective agreements in Korea are to be surveyed and analyzed.

- **Studies on Workers Protection Law (3)**

In this class, the development of the workers' protection law in various countries is studied and the Labor Standards Act and other workers' protection laws are learned in comparison with those of other countries.

- **Studies on System of Labor Dispute Settlement (3)**

The systems of labor dispute settlement in various countries are reviewed and the studies on the Korean dispute adjustment system through the National Labor Relations Commission are intensified.

- **Studies on International Labor Law (3)**

The inauguration of the International Labour Organization is reviewed and the substances of the international labor standards established by the conventions and recommendations adopted by the ILO are studied.

- **Studies on Worker's Participation System (3)**

The workers' participation system in various countries including Germany will be studied comparatively in relation with the historical and social conditions in both countries.

- **Studies on System of Unfair Labor Practices (3)**

The unfair labor practice system of Korea is compared to those of the United States and Japan and the realities of employers' unfair labor practices are surveyed and analyzed.

- **Studies on System of Industrial Accidents Compensation (3)**

The compensation for industrial accidents and diseases raised as a social problem in the course of economic development is to review in the legal and social aspects and the betterment of the present system is proposed.

- **Studies on Economic Law (3)**

The legal system of anti-trust and fair trade of Korea is studied comparatively in relations with social and economic conditions of various countries.

- **Studies on Consumer Protection Law (3)**

The purpose of this course is to probe and compare the systems of various countries on the recognition of the right of consumers and the legal protection thereof by focusing on the Consumer Protection Law.

- North Korean Law Field

- **Studies on Developments of North Korean Legal System (3)**

To examine the enactment and amendment of the North Korean Law by the social historic developing stages and to study development & the way forward of critical legal systems adjusted to the changed society of the North Korea including in the legal change in aspects of ideology and function.

- **Advanced Studies on North Korea Laws (3)**

To study the history, characteristics and articles and discuss general contents through analyzing the systematic classification and characteristics of the north korea law individual laws. Also to study the developed contents and characteristics of the North Korean legal system related to the political and economic reforms.

- **Studies on North Korean Human Rights (3)**

To study the definition and contents of so called "human rights by our way's itself" and discuss the legal system of the guarantee in North Korean human rights. Beside that, to examine the attitude of North Korea related to the international guarantee of human rights and study the theories and practices of the North Korean human rights.

- **Studies on North Korean Judicial System (3)**

To study the judicial, prosecutors, and lawyers system focused on the 'Court Formation Act', 'Lawyer Act', 'Criminal Procedure Act', 'Civil Procedure Act' and examine the principles, functions and features of 'Arbitration Act' focused on the arbitral system in North Korea.

- **Studies on North Korean Election System (3)**

To analyze the basic principles, contents, and characteristics of the Supreme People's Assembly, the Regional People's Assembly and representative election system in North Korea focused on the development of North Korean 'Election Act' & study the characteristics of North Korean election system comparing to them of other Socialist Countries.

- **Studies on North Korean Land System (3)**

To study on the 'Land law' and the 'Land Lease Law' of North Korea, to consider the principles and characteristics about way of foreign investment related to the



economy opening policy in North Korea, and to examine property issues of land preparing to a unified Korea forward.

- **Studies on North Korean Property System (3)**

To study the principles and the contents of nation, social community, and the individuals based on the socialist property system in North Korea, to analyze the change of the system, and to examine the way of development of the system preparing to a unified Korea.

- **Studies on North Korean Family System (3)**

To analyze the change of family system based on 'Family Law' in North Korea, to examine the principles & characteristics of the recent family system, and to consider legal issues & the preparing programs of social position and property of separated families related to Inter Korean Interchange & Cooperation and Unification comparing to family system in South Korea.

- **Studies on North Korean Foreign Investment and Foreign Economic-Related Laws (3)**

To analyze contents and characteristics of 'Foreign Investment Act,' 'Equitable Joint Venture Act,' 'Joint Management Act,' and 'Foreign Corporation Act,' and the principles & contents of foreign civil law, foreign economic contract law and foreign economic arbitral law, etc. related to the foreign economy opening policy in North Korea. And to study legal systematic problems and development strategies

- **Studies on North Korean State Organization System (3)**

To analyze the change of central and regional sovereign organization systems in North Korea, and then to discuss the organizing principles, system, contents based on the principles and contents of the related laws such as 'Regional Sovereign Organization Act,' 'Metropolitan Management Act,' and so on.

- **Studies on Law of South and North Korean Relations (3)**

To examine legal characteristics between South and North Korea in the separated age, consider the legal status of North Korea, study the legal relations based on the change of Inter Korean relations in the reconciliation & cooperation age, particularly examine the point at issue related to the background & legal principles of the Inter Korean special relation theory.

- **Studies on Inter-Korean Exchange and Cooperation Laws (3)**

To examine the legal issues showing up due to the personal & physical exchange with the enlargement of Inter Korean Exchange and Cooperation, analyze the issues of inter Korean exchange and cooperation laws, study legally improving program supporting Inter Korean Exchange and Cooperation.

- **Studies on Chinese Laws (3)**

To analyze the contents & characteristics of the Constitution, Civil Law, Commercial Law, Foreign Investment Law in China which is influencing economy reforming legal system of North Korea as an aspect of importing capitalism under socialist system. And then to research the relation between legal system of North Korea and China and the way forward.

- **Studies on Divided Nation's Unification and Legal Adjustment (3)**

To study the legal adjustment for unification process between North and South Korea, through the case study of Germany (BRD and DDR) and Yemen (North and South)

- **Studies on Constitutional Cases of Divided Nations (3)**

To study a "Unified Constitution", which is desirable to the Constitutional Order in Korea, by analyzing the confrontation and unified contents in Germany and Yemen that were divided nations on the basis that the legal fundamental of a unified Korea is the "Unified Constitution".

- **Advanced Studies on Unification Legislation (3)**

To analyze the cases about unification on legal approach, to study unified legal systems in Germany, Yemen, Vietnam, China and Taiwan and to learn the lessons for the legal development of the unification of South and North Korea.

- **Advanced Studies on North Korean Constitution (3)**

To compare and analyze the Constitutions among the USSR, East European Socialist States and North Korea, particularly research the relation to the Chinese Constitution related to recent turning for new social order in North Korean Constitution.

- **Studies on Unification Process and Constitution of Divided Nations (3)**

To compare and consider the Unification Process and the Constitutions of the divide nations including Germany, Yemen and Vietnam. To study the principles and characteristics of so called 'Unified Constitutions' related to those nations.

- **Studies on international Safeguard of North Korean Human Right (3)**

To analyze the situation of human rights in North Korea, research contents of the reports on North Korea Human Rights according to the International Human Rights Covenant and the real situation, to study the program for international safeguard of North Korean human rights.

- **Studies on Human Rights of North Korean Defectors and NGOs (3)**

This course focuses on examining the types and legal status of North Korean defectors, researching the actions and roles of NGOs to protect human rights of refugees, and studying legal protection programs for refugees. research actions & roles of NGOs for protection of human rights of refugees.

· **Comparative Studies on Economic Open-Related Laws between China and North Korea (3)**

To analyze the development of economic legal system in North Korea by studying the common and features differences of types and contents between China and North Korea on the basis of economic open related legal systems in both nations.

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## Department of Economics

The graduate program in economics at Kookmin University aims to develop student's understanding and analytical ability as a competent economist. The program offers courses on advanced economic theory and various tools of economic analysis to equip students with the ability to analyze the economy and economic policies. M.A. degree students are required to take 8 courses (24 units) during 4 semesters. Ph.D. degree students are required to take 12 courses (36 units) during 6 semesters. Most of the graduates are employed in the private sector.

### ☐ Courses

#### ☐ Core Courses

- **Microeconomics (3)**

A core course in the graduate microeconomics: theories of consumer behavior, production, costs, the firm in various markets. The main emphasis is on the tools of economic analysis.

- **Macroeconomics (3)**

A basic course in graduate macroeconomics: models of business fluctuations, theories of consumption, investment, money demand, and analysis of monetary and fiscal policies.

- **Econometrics (3)**

It covers the single and multiple linear regression models, the associated distribution theory, and testing procedures: corrections for heteroskedasticity, autocorrelation, and simultaneous equations: and other extensions as time permits. Students also apply the techniques to a variety of data sets using PCs.

- **Studies in Microeconomics (3)**

Advanced Microeconomics. This course is similar to microeconomics, but uses more mathematics and covers more material. The course aims to teach the technical tools of economics and to apply them to a wide range of human behavior. Tools include consumer theory, optimization under uncertainty, game theory, welfare economics, incentive theory, and the economics of information. Topics include industrial organization, public finance, law and economics, the economics of the family, religion and riots.

- **Studies in Macroeconomics (3)**

Advanced macroeconomics with a theoretical orientation applicable to research

relevant to macroeconomics.

#### □ Major Courses

- **Statistics (3)**

This course is intended as an introduction to statistical inference and decision theory. The emphasis is on basic concepts and the theory underlying statistical methods rather than on a detailed exposition of all the different methods, although most of the elementary techniques of statistical inference and decision are discussed.

- **Public Sector Economics (3)**

The aim of this course is to provide an understanding of the role of government, the concept of public goods, cost-benefit analysis of public expenditures, and the workings of the public sector in general. Students are taught to develop a critical and analytical ability concerning problems of the public sector.

- **Money and Banking (3)**

It covers the basic theories and the various practical issues on money, banking and financial markets. For example, it mainly studies the behavior of interest rates and the working of financial markets, the principles of bank management, and the central bank and monetary policy.

- **International Monetary Economics (3)**

This course covers the second half of the international monetary issues. Two major themes are the international capital markets and international policy coordination.

- **History of Economic Thought (3)**

This course is divided into two major fields. The first one is a comparative study of the three major strands in economic thinking, that is subjective preference theory, cost-of-production theory and labour value theory. The second one is a historical review of classical economists including Mercantilists, Adam Smith, Thomas Malthus and David Ricardo.

- **Industrial Organization (3)**

This course covers the relationship between market structure, firm behavior, and market performance comprehensively. It also covers theory of the firm, models of industries and markets, the interior structure of firms, collusion, vertical relationship, auctions, patents and technological innovation, mergers and acquisitions, monopoly regulation and public policy.

- **Labor Economics (3)**

This course deals with various kinds of problems surrounding the transactions on labor service between workers and firms. Topics include the theory of time allocation, the payoffs to education as an investment, detecting wage discrimination, unions, and wage patterns.

- **Political Economics (3)**

The key concepts and theoretical structure of Marxian radical economic thoughts are explored. The background and principal ideas of Marx's historical materialism are explained. The basic idea of labour theory of value is introduced and assessed in comparison with the neoclassical economics.

- **International Economics (3)**

This course provides a framework for analyzing international flow of goods and services. Major focus of the course is on the determinants of international trade patterns.

- **Economic History (3)**

Economic analysis is applied to issues in Economic History. Typical topics include the development of the modern economy, the economics of colonization, the sources of nineteenth-century economic growth, economic causes and effects of immigration, the expansion of education.

- **Applied Microeconomics (3)**

An introduction to "the strategic way of thinking" and a primer on game theory with applications to economics and other social sciences. Topics covered include the prisoner's dilemma and the arms race; dominance reasoning and the minimax theorem; mixed strategies and Nash equilibrium; bargaining and collective action; threats, promises and negotiated games; the evolution of cooperation. No special mathematical preparation required.

- **Mathematical Economics (3)**

The study of functions and their rates of change. Fundamental ideas of calculus are introduced early and used to provide a framework for the study of mathematical modeling involving algebraic, exponential, and logarithmic functions. Thorough understanding of differential calculus promoted by yearlong reinforcement. Applications to economics emphasized according to the interests of our students.

- **Financial Economics (3)**

It covers the conduct of monetary policy and regulation on financial market. It also deals with the main features of Korean financial securities market.

- **Economics of Arts and Culture (3)**

This course explores the economic issues that arise in the organization of economic activity in the visual and performing arts and culture with substantial "creative" components. Issues of domestic and international public policy are addressed.

- **Taxation and Public Finance (3)**

Surveys theoretical and empirical analyses of taxation and government expenditures. Topics include tax incidence, optimal tax theory, public goods and externalities, and empirical analysis of responses to taxation.

- **Studies in Money and Banking (3)**

The theory of income determination, capital markets, and macroeconomic policy in the open economy. Applications to such issues as exchange rate determination, the history of international monetary regimes, international policy coordination, the debt crisis, and reform in Latin America, Eastern Europe, and Korea.

- **Studies in International Monetary Economics (3)**

Financial aspects of growth and income determination in open economies. Topics include international business cycle, monetary and exchange rate regimes, capital flows, and current issues in international macroeconomic policy.

- **Studies in History of Economic Thought (3)**

Primarily for faculty, visitors, and graduate students writing dissertations in economic history. Discussions of work in progress.

- **Studies in Industrial Organization (3)**

Theoretical and empirical analysis of contemporary topics in industrial organization. Uses economic theory to analyze important issues facing firms, and examines the practical challenges of empirical applications of theory. Topics include horizontal relationships and mergers, vertical integration and control through contractual arrangements, price discrimination, information and search costs, innovation and intellectual property rights, and network externalities. Each topic combines theoretical analysis with a study of actual firm behavior.

- **Studies in Labor Economics (3)**

Theoretical and empirical research on labor markets. Wage determination covers equalizing differences, human capital, job mobility, and incentive models. Labor supply covers life cycle models. Labor demand includes minimum wage and union models.



- **Studies in Political Economics (3)**

Offers an institutionalist perspective on the economy and economics. Analyzes the historical processes by which land, labor, and capital became commodities, and the processes by which the picture of the modern Western economy as one based on absolute scarcity, unlimited wants, and calculating, maximizing homo economicus came to be drawn. Discusses institutional basis of capitalism, relationship of politics to economics, and the limits of economic analysis.

- **Studies in International Economics (3)**

Research papers in all aspects of international economics, including theory, econometrics, and policy.

- **Economic History of Korea (3)**

It covers the character and development process of major industries that had been observed in the Korean economy during the Korean modernization period, dated from the second half of 19th century through the first half of 20th century.

- **Studies in Applied Microeconomics (3)**

An introduction to game theory and its applications to economics at a high level of rigor. Topics include extensive form and strategic form games, Nash equilibrium and Nash's existence theorem, subgame-perfect equilibrium, Bayesian equilibrium, and applications to repeated games, auctions, and bargaining.

- **Studies in Mathematical Economics (3)**

Topics vary slightly from year to year, but typically include the equilibria of various classes of games, the definition and application of "common knowledge" and non-equilibrium processes of strategy adjustment.

- **Studies in Financial Economics (3)**

An introduction to financial economics emphasizing discrete time models and empirical applications. Reviews basic asset pricing theory. Discusses empirical topics including predictability of stock and bond returns, the equity premium puzzle, and intertemporal equilibrium models.

- **Cultural Policy and Economy (3)**

It aims to provide an outlet for an interdisciplinary and international exploration of the nature, function and impact of cultural policies. It includes a broad view of cultural policy, encompassing culture as a "way of life" as well as culture in the narrower sense of the arts and cultural industries. It is concerned both with the policies of institutions and with the wider discourses which relate to the general conditions of culture.

- **Studies in Econometrics (3)**

An introduction to multiple regression techniques with focus on economic applications. Discusses extensions to discrete response, panel data, and time series models, as well as issues such as omitted variables, missing data, sample selection, randomized and quasi-experiments, and instrumental variables. Aims to provide students with an understanding of and ability to apply econometric and statistical methods using computer packages.

- **Economic Development (3)**

Provides a graduate-level overview of the theory of and evidence on economic development from a policy-oriented perspective. Aim is to allow students to analyze policy debates surrounding development from a broad and rigorous analytical base.

- **Comparative Economic Systems (3)**

The major institutions of capitalist market economy is theoretically explained. To do this some ideas of the Neo-Institutional school are introduced such as transaction cost, property rights. Some non-economic institutions like family are also covered. A comparative study of various forms of capitalism such as Anglo saxon model, German models is conducted as well.

- **Environmental Economics (3)**

Covers the theoretical understanding of external diseconomy of pollution, a role of environmental policies and international negotiations on various air and water related pollutions.

- **Theory of Technical Progress (3)**

This course covers types of technological innovation, innovation process, diffusion process, technological innovation strategy, technology and employment, technology and economic growth, technology and environment, innovation and public policy. It also covers the effects of technological innovation on firm's competitiveness.

- **Economic Fluctuations (3)**

Studies the relationship between economic growth, poverty, and income distribution. Discusses how globalization affects poverty and inequality. Studies the main theories of economic growth and the main potential sources of economic development, from physical capital accumulation, to education, to technology, to the role of government. Discusses various global issues such as public global health (e.g., the impact of malaria and AIDS on Africa), corruption and institutions, natural resources, the environment, international donor institutions, and population growth.

- **Open Macroeconomics (3)**

This course investigates determination of aggregate income, prices and foreign exchange rates under an open economy, and discusses effects of macroeconomic policies including foreign exchange market policies.

- **Public Choice Theory (3)**

Investigates the functioning of the political system and how it generates public policy, using the tools of modern economic theory. Seeks to understand the structure of government and the behavior of agents in (and relation with) it. Special attention paid to Legislatures, the Bureaucracy, and intergovernmental relations. Applications include: voting, campaigning, political activism, strategy and compromise in the legislative process, economic reforms, judicial enforcement, federal public finances, monetary unions, processes of economic integration, free-trade agreements, and the process of decentralizing the provision of public services in many developing countries (devolution).

- **Information Economics (3)**

In this course, we study what kinds of problems with the efficient functioning of a market may arise when people have asymmetric information. The introduction of asymmetric information into various economic problem will give us new insights into how market failure might arise and whether there may be corrections which can improve welfare. Well-known problems like adverse selection and moral hazard as well as other problems will be discussed.

- **Consumer Economics (3)**

This course analyzes various kinds of problems associated with personnel management on the basis of economics tools. Typical topics include recruitment, labor turnover, team production, and job allocation.

- **Input-Output Analysis (3)**

Input-Output Analysis contains new contributions to inter-industry economics by a set of internationally respected authors. We explore the frontiers for traditional topics in input-output analysis such as inter-industry linkages, feedback effects, and the composition of economic changes.

- **Economic Growth (3)**

It covers various topics associated with business cycles and economic growth. Topics include the role of financial market in economic fluctuations, exogenous and endogenous growth models, and sources of business cycles.

- **Economics Workshop (3)**

Participants discuss recent research in economics and present their own work in progress.

- **Advanced Economics Workshop (3)**

Serves mainly as a forum for presentations by graduate students of their current research. Work presented can be very preliminary and conjectural.

- **Seminar for M.A. Students (3)**

This course is designed for M.A. students who want to obtain knowledge in themes in Economics. Various topics may be covered by experts from outside the University.

- **Advanced Seminar for M.A. Students (3)**

This course is designed for M.A. students who want to obtain knowledge in Advanced themes in Economics. Various topics may be covered by experts from outside the University.

- **Selected Topics in Master's Thesis (3)**

In all cases the thesis topic must have been formally submitted to and approved by a thesis advisor.

- **Master's Thesis (3)**

In all cases the thesis topic must have been formally submitted to and approved by a thesis advisor.

- **Advanced Microeconomics (3)**

A comprehensive course in economic theory designed for doctoral students in all parts of the university. Consumption, production, uncertainty, markets, general equilibrium. Applications to policy analysis and business decisions. Emphasizes the use of economic theory in practical research.

- **Advanced Macroeconomics (3)**

A basic course in graduate macroeconomics, including models of business fluctuations, theories of consumption, investment, money demand, and analysis of monetary and fiscal policy.

- **Advanced Econometrics (3)**

Statistical decision theory with applications to portfolio choice, panel data topics, selection bias, demand and supply, qualitative choice, and quantile regression.

- **Selected Topics in Microeconomics (3)**

Agricultural issues : Peasant behavior, land tenancy, interlinked markets. Credit and insurance market problems and institutions. Health, nutrition, and productivity. Gender bias. Education.

- **Selected Topics in Macroeconomics (3)**

Dynamic models of development emphasizing migration, modernization, and technological change: static and dynamic models of political economy: rent seeking in and outside the government: trade liberalization, macroeconomic stabilization, and reform: the dynamics of income distribution and institutional change.

- **Selected Topics in Econometrics (3)**

Surveys various research designs that may be useful in empirical microeconomic research. Using examples from research in labor economics, covers issues in econometric modeling and identification, and causal interpretation in analyses of non-experimental data. Also provides a practical guide to implementing various econometric tools useful for applied research using cross-sectional and panel data.

- **Survey in Economics (3)**

Participants discuss recent research in economics and present their own work in progress.

- **Selected Topics in Economics (3)**

It covers important economic issues in the actual economy, which are not provided by typical text books. Students are required to present their studies on current economic issues in detail.

- **Seminar for Doctoral Students (3)**

This course is designed for Doctoral students who want to obtain knowledge in themes in Economics. Various topics may be covered by experts from outside the University.

- **Advanced Seminar for Doctoral Students (3)**

This course is designed for Doctoral students who want to obtain knowledge in Advanced themes in Economics. Various topics may be covered by experts from outside the University.

- **Selected Topics in Doctoral Thesis (3)**

In all cases the thesis topic must have been formally submitted to and approved by a thesis advisor.

• **Doctoral Thesis (3)**

In all cases the thesis topic must have been formally submitted to and approved by a thesis advisor.

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## Dept. of International Trade

The objective of this program is to develop the intellectual breadth and to provide the specialized training necessary to a career in teaching, in research, or in the professions related to international business and economics. Emphasis is placed on the knowledge, methods, and skills needed for scholarly teaching, original research and problem solving, intellectual leadership, creative expression, and other methods of achievement in the individual's chosen discipline.

Three programs are available in each field: master's degree program, doctoral degree program and joint program of master's and doctoral degree. Our program is offered in the following areas: international trade and international finance. These two programs are designed to accommodate students having a bachelor degree in economics and business or in other fields. All programs of work and course sequence must be approved by Graduate Studies Committee and by the dean of the Graduate school.

### ☐ International Trade Major

Students study international trade theories and international trade policies in depth. Based on the international trade theories, applied subjects such as economic integration and economic developments are also examined in this major.

### ☐ International Finance Major

The purpose of this major is to investigate the structures and price determinations of international financial markets including foreign exchange markets. The linkage between the domestic and international financial markets are also studied.

### ☐ Courses

#### ☐ Core Courses

##### • **Microeconomic Theory (3)**

This course covers microeconomic theories and their application to various topics in consumer behavior, demand, production, costs, etc.

##### • **Macroeconomic Theory (3)**

This course introduces determination of national income and prices, and explains effects of macroeconomic policies on production, employment and prices.

##### • **Statistic Analysis of Economics and Business (3)**

The aim of this course is to provide an understanding of the statistical inference theory in graduate level.

- **Econometrics Analysis of Economics (3)**

This course is basically concerned with the analysis of multiple linear regression model. The topics of heteroscedasticity, serial correlation and two stage least squares will be discussed.

- **Study on Statistical Package (3)**

This course introduces how to start and use the statistical packages frequently used in Economics and Business.

- **Research Methodology (3)**

This course offers basic tools necessary for thorough analysis in business and economics. In this course students get acquainted with computing skills, essay writings, word processing skills, Excels, and so on.

- **Advanced International Trade Theory (3)**

This course provides an advanced treatment of theories of international flow of goods and services. Major focus of the course is on the determinants of international trade patterns.

- **Research Ethics & Thesis Study**

This course introduces what the research ethics are and how they are applied to the thesis writing.

- **Principles of International Economics**

This course provides a comprehensive introduction to the principle theories employed in international economics.

- **Trade English**

This course is designed to understand the articles on trade and international economics.

☐ International Trade Major

- **International Trade Theory (3)**

This course provides basic treatment of theories of international flow of goods and services. Major focus of the course is on the determinants of international trade patterns.



- **Advanced Theory of Tariff (3)**

This course covers advanced theoretical and practical issues related to tariffs. The effects of tariffs are thoroughly examined.

- **Advanced International Trade Policy (3)**

This course intends to acquaint students with advanced topics and theories of international trade policy.

- **Advanced Development Economics (3)**

This course covers various topics associated with economic development. Topics include various development models and growth models.

- **Advanced Seminar in International Trade Theory (3)**

This course provides seminars in theories of international flow of goods and services. Major focus of the course is on the determinants of international trade patterns.

- **Advanced Seminar in International Trade Policy (3)**

This course provides seminars in advanced topics and theories of international trade policy.

- **Theory & Practice of Korean Trade (3)**

This course covers various topics and theories associated with Korean Trade.

- **Industry Studies**

This course aims at understanding what drives the differences in sales across industries and why do firms' relative positions tends to change over time.

- **Understanding Global Trade**

A study of relationship between trade environment and economic integration.

- **Trade Patterns in East Asia**

A study of economic changes in East Asian countries on export, foreign direct investments and financial market.

- ❑ **International Finance Major**

- **Balance of Payments Theory (3)**

This course introduces determination of the exchange rate, and explains effects of

macroeconomic policies on output and balance of payment under the various exchange rate systems.

- **Money and Banking (3)**

This course examines how financial markets and financial institutions work and explores the role of money in the economy.

- **Advanced Foreign Exchange Rate Economics (3)**

This course covers the modern foreign exchange market and focuses on the determination of exchange rates.

- **Advanced International Finance (3)**

This course covers the new open economy macroeconomics.

- **Topics in International Capital Movement (3)**

This course covers the current topics in the international capital markets.

- **Seminar in International Finance (3)**

This course investigates the recent theoretical development and empirical findings in international finance.

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## Dept. of Business Administration

The department of business administration offers a fine graduate program with excellent faculty members as well as high quality academic resources and facilities. The program provides a small group of selected graduate students with opportunities to gain an understanding of latest theories and practices in modern businesses and to conduct in depth research into key business issues. The program aims to produce students who make significant contributions to their respective businesses or academic communities through their knowledge and insights gained through rigorous training. To achieve this goal, the program equips students with modern business theories and capabilities of research into key business issues. Through intensive and systematic guidance by faculty, the program trains young scholars by helping them acquire creative thinking and insights into the business world. The program put emphasis on students' good character and ethical standards required in the globalizing world.

### ❑ Personnel Management Major

The Personnel management Major is designed to educate students with the leading edge theory and practice associated with the organization design and people management. It spans topics from understanding the behavior of individuals and groups to designing management systems and structures to support business strategy. Topics of interest include organizational behaviors, organization theory, human resource management, strategic management, and entrepreneurship.

### ❑ Finance Major

Finance major offers courses relating to the financial organization, operations, and problems of the economy at large and stressing issues of financial management in business firms, financial institutions, and units of government. While some attention is given to the descriptive, institutional, and historic aspects of the field, primary emphasis is placed on the analytical foundations of the discipline, making extensive use of the relevant techniques of economic analysis, mathematics, and statistics. By stressing theory and methods of analysis, the department provides the student with the tools for dealing with important practical issues. Graduates generally seek their professional career opportunities in positions in financial departments of general businesses, investment banking firms, management consulting firms, commercial banks, and other financial institutions.

### ❑ Marketing Major

The field of marketing is a valuable preparation for many types of management careers

including consulting, entrepreneurial management, and line management. The variety of courses offered by the marketing faculty has been designed to meet the needs of management generalists and those who choose either the marketing management or marketing research major areas. Using a combination of lectures, readings, case studies, and computer simulations, the course reviews the fundamental approaches to analysis in each of the marketing policy areas, new product development, pricing, promotion strategy, management of channels of distribution, and marketing research.

#### ☐ Accounting Major

Accounting major specialized in a formal system of collecting, organizing and reporting financial data that are used in making economic and strategic decisions. Most courses in the major stress concepts, procedures and applications with a view to the generation of accounting information and its reliability in the financial market. The major is helpful in pursuing career opportunities in private and public institutions as well as in CPA (certified public accountant) firms.

#### ☐ Global Business Innovation Major

21st Century is characterized by the large global companies leading the world economy, more intense cross-national competition, the enhanced interdependency between national economies, and the conglomerate and diverse relationship between economic entities. 'Global Business Innovation' Major tries to train and produce the elite human resources this global century urgently demand.

#### ☐ Service Management Major

Service Management major provides students with a deep grounding in the basic logic of management of services enterprises as well as service innovation of manufacturing enterprises. This major offers a range of courses covering theories and methodologies as well as cases in service management and service innovation. This background would position students well for leading service innovation at both services and manufacturing enterprises.

#### ☐ Courses

##### ☐ Core Courses

##### • **Research Methodology (3)**

The course aims at equipping students with capabilities to design and conduct in-depth empirical analysis on research topics on modern business. Students exercise statistical tools with their own research data.

- **Seminar in Business Statistics (3)**

The level of this course is higher than that of 'Business Statistics'. Students in the Ph.D program learn higher-level concepts of statistics and acquire higher-level statistical techniques.

- **Seminar in Research Methodology (3)**

The level of this course is higher than that of 'Research Methodology'. Students in the Ph.D program learn higher-level concepts of research methodology. This course helps students find appropriate research methodology and statistical tools for their research topics.

- **Econometrics (3)**

The aim of this course is to help students get acquainted with feasible and valid econometric techniques so that they could extract the right information from the right data to have the right understanding of the economic problems of interest. To achieve this, we discuss both econometric theories and many empirical applications. In particular, this introductory class will be focused more on practices with computer exercises rather than analytic proofs.

- **Research Ethics & Thesis Study(3) (추가)**

Graduate students will develop an understanding of the nature of ethical decision-making and its role in research ethics. They will also acquire an appreciation of the reasons for conducting ethical review of research and an awareness of some of the international codes of research ethics that have been developed in response to scandals and abuses in research. Finally, they will understand the nature and definition of research ethics and an appreciation of the importance of good research.

☐ Personnel Management Major

☐ Personnel Management Major

- **Organizational Behavior Organization Behavior (3)**

Organizational Behavior is a field of study that investigates the impact that individuals, groups, and structure have on behavior within organizations, for the purpose of applying such knowledge toward improving an organization's effectiveness. This course offers an introduction to the best works (mostly articles but also include book chapters) that have been published on the important research areas within the field of organizational behavior. This course helps students have theoretical perspectives on classic and current

issues in organizational behaviors.

~~The course examines behavior of individuals and small groups in organizations, and explores the link between micro and macro organization theories. It provides an opportunity for students to grasp knowledge in motivation, personality, leadership, conflict management among individuals, teams, groups, and organizations.~~

- **Human Resource Management (3)**

Students learn theories and practices in managing human resources effectively and motivating self-development of employees. The course covers topics such as recruitment, selection, training and development, performance evaluation, compensation, employment relations, and high performance organizations.

- **Organization Theory Theories Organizations and Environment (3)**

The major topics in the course include organizational structure and design. The course explores the organizational structure that best fits the surroundings. Resource dependence, population ecology, transaction cost economics, network theory, and power theory are the topics to be learned in this course.

- **Strategic Management (3)**

This course focuses on the foundation of strategic management research. The course will offer an understanding of the key concepts, theories and interconnected research streams in strategic management. The objectives of this course are to (1) review the major theoretical perspectives and issues studies in strategic management research to (2) help students have an interdisciplinary perspective on current issues in strategic management. The course begins with the question of performance differences between firms among and across industries, which could be explained through a variety of lenses addressed in this course

- **Research in Leadership (3)**

The course discusses many theories on leadership-one of the key issues in organizational behavior-and how to put them into practice. This course covers various theoretic perspectives such as trait theory, contingency theory, transactional versus transitional approach, charismatic leadership, and issue leadership.

- **Negotiation in Organizations (3)**

This course will provide students with various perspectives in behavioral decision making theory and behavioral approach to negotiation. The course views an individual primarily as a bounded rational decision maker in mixed motive contexts which combine competitive and cooperative aspect of the exchange relationship. Each class covers major theories in the negotiation literature by reviewing a core set of readings and discussing critical issues that have been developed in the field. Learning objectives of this course include 1) obtaining an understanding of the central concepts of the decision making and negotiation literature, 2) developing expertise in the domain of scholarly interest, 3) exploring new research ideas and models, 4) building necessary practical skills of negotiation and other conflict resolution techniques, and 5) gaining practical experience to become

- **Research Methodology for Organizational Studies**

The purpose of this course is to provide master and doctoral students with a foundation for designing and using methods (quantitative and qualitative) to perform empirical research in organizational behavior and human resources (OB/HR) areas. Rather than giving you the detailed background knowledge of each method – which you can learn in other method classes, we focus on the set of practical skills that can be applied to your own research in the current field of OB/HR.

- **Seminar in Organizational Behavior (3)**

In this course, organizational behavior is explored at the individual, group, and organization levels. The course explores related theories and cases. It provides an opportunity for students to learn current advanced knowledge in motivation, personality, leadership, conflict management among individuals, teams, groups, and organizations. The final purpose of this course is to complete publishable paper draft or proposal.

- **Seminar in Human Resource Management (3)**

The purpose of this course is to provide master and doctoral students with a comprehensive understanding of the domain of Human Resource Management (HRM) research. The course is structured largely into two parts. In the first half of the semester ("HR in Action"), we will review the topics in HR such as recruitment, selection, training, and compensation while reading articles related to each topic. The goal of this first part of the course is to allow you to narrow down the HR topics that you are interested in studying. In the second half of the semester ("Theoretical Lens"), we will



examine theoretical perspectives that researchers and other students in organizational behavior and HR have used to understand (and critique), predict, and ultimately control the behavior of individuals in organizational settings. The goal of this second part is to help you find the right theoretical lens to explore "the" HR topic of your choice.

- **Seminar in Strategic Management (3)**

Students in this course survey the related literature; look into recent theories and practices in business strategy; and prepare thesis for graduation. This course covers various current theoretical issues such as strategic processes, business strategy, and corporate strategy.

- **Seminar in Organization Theory (3)**

The course gives an in depth look into theories and practices in organization structure and design; explores how to implement some of the theories in real world businesses. Selected topics in this course include system theory, resource dependence, population ecology, transaction cost economics, network theory, and power theory.

- **Special Topics in Management (3)**

This course expects students to conduct analysis on the project of their own choosing. The topic is determined freely based on the discussion between the instructor and the students.

- **Seminar in Entrepreneurship (3)**

This seminar will focus upon the theoretical and empirical research on entrepreneurship. It will let students (1) become familiar with relevant research on Entrepreneurship (2) develop and evaluate research questions within the field. Most literature is related to the entrepreneur or entrepreneurial team, but may include corporate entrepreneurship within the established firm. The seminar is closely related to courses in strategic management, which are recommended to be taken before this seminar.

- **Seminar in Coaching Psychology (3)**

This course focuses on the comprehensive understanding of the domain of coaching theories. This course involves the application of the research theory and practice of the behavioral science of psychology to the coaching area. The

purposes of this course are to (1) review the major theories on coaching to (2) help students have an interdisciplinary perspective on current issues in coaching field,

- **Human Resource Development (3)**

This course is designed to provide students with an overview of various theoretical perspectives and research processes in human resource development. Students learn key concepts, procedures, and practices of human resource development. Also, students explore a wide range of systematic activities of an business organization to provide its employees with the necessary knowledge and skills that meet current and future job demands. More specifically, topics will cover needs assessments, task analysis, designing and implementing training programs, evaluating training programs, career development, and organization development.

- Accounting Major

- **Market Based Research in Financial Accounting (3)**

This is an advanced course that enables students to understand the advantages and limitations of using an accounting model to track firm financial performance. Financial market based research readings, problems, and cases are used for class discussion.

- **Accounting Regulation & Policy (3)**

This course examines the effect of governmental accounting regulations on firms financial decisions and firms' accounting policy changes in reaction to the regulations. Key themes of regulatory framework are applied to firms' financial decision contexts.

- **Seminar in Financial Accounting (3)**

This course examines contemporary issues of financial accounting with particular emphasis on changes in accounting standard, especially introduction of International Financial Recording Standards. Related articles are used for class discussion.

- **Advanced Topics in Tax Accounting (3)**

This course examines controversial issues of income taxation with particular emphasis on choice of entity, income recognition, capital gains and losses, forms of compensation, M&A, investment tax planning, and tax management.

- **Taxes & Accounting & Business Strategy (3)**

The objective of this course is to develop a framework for understanding how taxes affect business decisions. The key themes of the framework are applied to decision contexts, such as investments, compensation, organizational form, etc.

- **Seminar in Auditing (3)**

This course includes a consideration of the role of auditor, the organization of the accounting profession, and the current audit environment. A conceptual theory of auditing is discussed, and practical examples of auditing techniques are used to illustrate application of theory.

- **Advanced management Accounting (3)**

This course provides a detailed look at the use of management accounting information. Cost structure is analyzed in using different kinds of costing methods. The emphasis is on the identification and measurement of cost drivers and the uses and limitations of management accounting information.

- **Accounting Information & Capital Market (3)**

This course introduces the concepts and methods used in analyzing corporate financial statements in line with the information of capital market. Readings, problems, and cases are used for class discussion.

- **Accounting Information & Economic Organizations (3)**

This course introduces the basic concepts and methods used in analyzing corporate financial statements. The emphasis is on use of accounting information by investors and other interested external parties. Readings, problems, and cases are used for class discussion.

- **Management Control System (3)**

This course deals with the management control systems of firms, especially emphasizing on cost analysis and performance evaluation of units. Included are issues related to transfer price, productivity measures, the estimation of cost functions, and the study of benchmarking procedures.

- **Financial Accounting Theory & Practice (3)**

The course introduces accounting theory to explain and predict firms' accounting practices. It provides reasons for observed practice and prediction of unobserved accounting phenomena.

- **Positive Accounting Theory (3)**

The course reviews the theory and methodology underlying the economic-based empirical literature in accounting. Theory provides an explanation for accounting and auditing practice. For example, a theory explains why some firms use accelerated

depreciation methods and others use straight line.

□ Finance Major

• **Corporate Financial Theory (3)**

The purpose of this course is to trace the impact of the economic recession and political turmoil on contemporary Russian society. Through this course, students analyze changes since the collapse of USSR. Special focus is put on changes since perestroika, such as class stratification, population movement and growth. Welfare systems, gender stratification and women's issues, environment problems, and educational issues are also studied. By analyzing Russian society in the context of radical transformation, this course works to understand characteristics of Russian society and directions of future change.

• **Research Methodology in Finance I (3)**

Quantitative techniques required for finance majors are covered in this course. The examples of techniques include linear algebra, optimization, and regressions. The course will utilize software programs for statistical analysis.

• **Research Methodology in Finance II (3)**

Students will learn some basic knowledge of financial time series data, study simple models and methods for analysis of financial time series, and understand proper use and limits of econometric methods in finance in this course.

• **Investment Theory and Strategy (3)**

This course on investments covers theoretical models on investments, investment strategies, metrics used in evaluating investment performance, and portfolio management techniques.

• **Introduction to Financial Theory (3)**

The course analyzes financial activities of business organizations. The course aims at familiarizing students with techniques to evaluate business performance based on financial statement information.

• **Financial Engineering (3)**

Students are expected to obtain a thorough understanding of risk-return characteristics of various investment instruments such as equities, bonds, convertibles, futures and options. Students learn pricing models and investment strategies using these instruments.

• **Corporate Control (3)**

The topics covered in this course is theories of firm, agency problems, bankruptcies

and restructuring, and various M&A techniques and issues. This course will focus on the mechanisms for hostile takeover as also takeover defenses such as poison pills, golden parachutes, etc.

- **Theory of Financial Decision Making (3)**

This course covers portfolio analysis, asset pricing models, and investment strategies. It uses both the lecture and the case method of instruction to develop a practical understanding of some of the more important financial instruments and markets and to enhance abilities of application to real world.

- **Valuation Seminar (3)**

This course focuses on corporate asset management, in particular, on valuation. Topics that will be discussed include financial statement analysis, estimating cost of capital, valuation of projects, valuation of companies in takeovers, cross border valuation, and valuation of strategic options.

- **Risk Management Seminar (3)**

The objective of this course is to provide students with a risk management view of financial institutions and financial functions. The key areas covered will be the rationale for the existence of financial intermediaries, interest rate risk, market risk, credit risk, etc.

- **Fixed-income Securities (3)**

This course primarily covers the valuation of fixed income securities including pure discount bonds, coupon bonds and related derivatives. The course focuses on analytic tools used in interest rate risk management.

- **Empirical Finance (3)**

The course discusses empirical research papers in finance. The aim of the course is to help students understand empirical results with respect to major corporate decisions and familiarize them with essential research methodologies.

- **Seminar in Corporate Finance (3)**

The objective of this course is to develop an advanced understanding of the main financial and investment decisions that firms face. The course will focus on capital structure and financing decisions as well as IPOs, mergers and acquisitions, private equity and LBOs.

- **Seminar in Investment Management (3)**

The objective of this course is to help students develop an advanced understanding of portfolio theory, equilibrium models of security prices, the empirical behavior of security prices, market efficiency, performance evaluation, and

behavioral finance.

- **Seminar in Capital Market (3)**

This course will include advanced topics such as the term structure of interest rates in bond markets, how stocks and bonds should be priced, and why those prices are sometimes not realized because of institutional factors or market frictions.

- **Special Topics in Finance (3)**

This research oriented course focuses on several special topics in finance and motivates students to participate in class discussions that are expected to generate insights into important business issues.

☐ **Marketing Major**

- **Consumer Behavior (3)**

The course focuses on concepts, issues, and trends about customer behavior and customer orientation. It provides students with specific research tools to generate insights about customers and with experience in applying them to the analysis of marketing problems and design of marketing strategy.

- **Marketing Research (3)**

Marketing research is the way companies obtain customer insights. This course provides a rigorous experience in marketing research methods such as questionnaire designs, data gathering tools, statistical analysis techniques, and frameworks to guide when and which technique is most useful.

- **Product Management (3)**

This course provides a comprehensive analytical coverage of the various product decisions, critical discussion of the research needed as input to the decisions, and the contributions of management and behavioral sciences to product development process.

- **Marketing Channel Management (3)**

In this course, students study traditional and new distribution channels and institutions as well as techniques in designing and managing marketing channels. Empirical issues are also studied and discussed.

- **Advertising Management (3)**

The primary objective of this course is to provide students with an opportunity to analyze, design, and evaluate various advertising decisions. The course focuses on the concepts, theories, models, and findings from marketing, marketing research,

communication research, and management science that are relevant to the design and evaluation of advertising tools.

- **Pricing Management (3)**

Pricing is an important strategic variable in marketing mix. The course discusses factors relevant to pricing decisions: competition, cost structure, consumer psychology, etc.

- **Marketing Information System Management (3)**

This course is concerned about marketing information to improve the efficiency of decision making in marketing. Topics include collection and classification of marketing information, configuration of marketing information system and other information systems in the firm.

- **Marketing Strategy (3)**

This course is designed to give students an integrative framework for analyzing marketing programs and deriving marketing strategies. Setting objectives and making decisions about products, services, pricing, promotion, and distribution will be studied.

- **Multivariate Data Analysis (3)**

In this course, students learn qualitative and quantitative research methods in marketing. Special emphasis of this course is on making students to acquire basic multivariate analytic tools such as factor and cluster analysis, conjoint analysis, multidimensional scaling, and LOGIT.

- **Services Marketing (3)**

The purpose of this course is to provide students with a thorough understanding of the role of services in marketing strategy and competition, and how these issues guide the management of service operations.

- **Brand Marketing (3)**

This course covers the creation and management of brand equity. Topics covered include the importance of brand equity; frameworks to conceptualize what it is; how to strategically plan a brand's target equity; tactics to build brand equity; brand extensions; brand valuation; and global branding.

- **Seminar in Marketing Channels (3)**

In this course, current research papers will be read and discussed. Topics include designing channel structure and incentives to match positioning, managing channel conflict, exploring links between channel and branding strategies, understanding multi-channel approaches, and internet distribution. New issues and methodology

will be scrutinized.

- **Seminar in Advertising (3)**

The goal of this course is to expose students to current research topics and research papers in advertising and advertising management. The course deals with theories and issues in ads planning, media choice, ads production, measurement of ads effects. Consumer behavior and economic theories related to advertisement strategy are studied in depth, with the purpose of developing new framework or theories.

- **Seminar in Product Development (3)**

This class teaches New Product Development(NPD). Students become primarily familiar with the tools and methods for NPD which marketers and engineers use. Note that the focus of NPD is the integration of the marketing, design, engineering, and manufacturing functions of the firm in creating a new product. Thus, this course is intended to provide you with the following benefits:

- Competence with a set of tools and methods for product design and development.
- Confidence in your own abilities to create a new product.
- Awareness of the role of multiple functions in creating a new product (e.g. marketing, industrial design, engineering, production, environmental safety).
- Ability to coordinate multiple, interdisciplinary tasks to achieve a common objective.

- **Seminar in Marketing Information System (3)**

The goal of this course is to expose students to current research topics and research papers in marketing information generation and marketing information management. New issues and new methodology will be discussed.

❑ **Service Management Major**

- **Business Diagnostics (3)**

The course discusses various analytical frameworks to examine business issues faced by the firm. Business cases are intensively used in this course.

- **Management Information Systems (3)**

The course teaches students an overview and various types of information systems and/or information technology as a major tool or methodology to perform business innovation.

- **Introduction to Business Innovation (3)**

Basic knowledge on business innovation are to be taught in this course. A history



of business innovation, several cases of business innovation, change history of innovation methodology are to be discussed.

- **Service Management (3)**

The course teaches students how to improve productivity in service industry. Various cases are to be discussed.

- **Service Science (3)**

This course teaches students an overview of service science and service innovation, trends and research areas on service science.

- **Current Issues on service Management (3)**

The course conducts a further in-depth study on key service management and business innovation issues in this new service based economy.

- **Seminars on Service Management (3)**

As a further study of "Current Issues on service Management" course, this course conducts a further in-depth study on new service management and business innovation issues.

- **Case Studies in Service Management (3)**

The course discusses multiple cases of service management and business innovation. Various types of service industry and diverse tools and techniques of service innovation are to be discussed.

- **Service Management Methodology (3)**

Various tools and techniques of service innovation are analyzed. The 'goodness-of-fit' of 10 most powerful service innovation methodologies to case-by-case occasions will be assessed.

- **Tourism and Hospital Management (3)**

The course discusses efficient management and strategy issues of tourism service industry and medical service industry, individually and as a combined industry.

- **Sports Management (3)**

The course discusses efficient and effective management and strategy issues of sports business service industry as a new major service industry.

- **Entertainment Management (3)**

The course discusses efficient and effective management and strategy issues of entertainment service industry as an ever evolving service industry.

❑ Global Business Innovation Major

• **Strategy in the Global Context (3)**

This class discusses the problems and solutions occurring during the process of strategy formulation and implementation of global companies in key industries.

• **Management & Global Legal Environment (3)**

This class attempts to give budding entrepreneurs and future line managers a general understanding of the legal framework within which commercial transactions occur and the context in which legal problems arise. Topics include the formation of a new business organization, intellectual property, contracts and torts.

• **Global Business Development & International Portfolio Management (3)**

This class explores the issues of conducting business in an international context, including an analysis of project management, information resources, and cultural differences.

• **International Business Ethics & Managerial Responsibility (3)**

This class provides students with the ability to anticipate, critically analyze, and appropriately respond to the social, ethical, and political challenges that face managers operating in a global economy.

• **Business Forecasting (3)**

This class examines the approach to analytical thinking-forcing numerical and textual data into carefully formulated alternative models. Data studied include macroeconomic variables (growth, inflation, unemployment, interest rates, and exchange rates), industry data, and firm data.

• **Case Analysis in Global Business Innovation (3)**

This class analyzes and investigates the cases, policies and background of global and domestic companies. Attendants may apply a modified strategy and policy on the cases, and analyze and discuss their results.

• **Globalization Strategy for Knowledge-based Industry (3)**

The course conducts an in depth study on globalization strategy for knowledge based industry including software industry.

• **Supply Chain Management Seminar (3)**

In this course, the students learn about the principles of supply chain management and some scientific management techniques for efficient supply chain management. They also discuss about some key issues regarding supply chain management.

- **Operations Management Seminar (3)**

In this course, the students learn about some scientific techniques to efficiently manage the product and service operations in theories and with case studies. They also discuss about some key issues regarding Operations Management.

- **Logistics Seminar (3)**

In this course, the students learn about types and functions of physical material flow in industries, and they are educated to design and maintain the efficient logistic system. They also discuss about some key issues regarding logistics.

- **Purchasing and Supply Management (3)**

This course provides the basic knowledge about the purchasing or supply operations as the first main activity done by any companies in the supply chain system. In this course, the students learn about the management of purchasing and supply operations, value-added operations in supply process, and negotiation procedure in purchasing.

- **Seminar in New Product Management (3)**

This class teaches New Product Development(NPD). Students become primarily familiar with the tools and methods for NPD which marketers and engineers use. Note that the focus of NPD is the integration of the marketing, design, engineering, and manufacturing functions of the firm in creating a new product. Thus, this course is intended to provide you with the following benefits:

- Competence with a set of tools and methods for product design and development.
- Confidence in your own abilities to create a new product.
- Awareness of the role of multiple functions in creating a new product (e.g. marketing, industrial design, engineering, production, environmental safety).
- Ability to coordinate multiple, interdisciplinary tasks to achieve a common objective.

- **Management Control Systems (3)**

This course deals with the management control systems of firms, especially emphasizing on cost analysis and performance evaluation of units. Included are issues related to transfer price, productivity measures, the estimation of cost functions, and the study of benchmarking procedures.

- **Strategic Management of Technological Innovation (3)**

Technology Management is the management of the use of technology for human advantage. It allows organizations to manage their technological fundamentals to create competitive advantage. Typical concepts used in technology management are

technology strategy(a logic or role of technology in organization), technology forecasting(identification of possible relevant technologies for the organization, possibly through technology scouting), technology road-mapping (mapping technologies to business and market needs), technology project portfolio

- **Understanding of International Finance (3)**

This course is designed to help you develop a deeper understanding of the issues and the necessary skills as managers of a corporation that are exposed to international financial transactions. The issues addressed in this course include the globalization, and the need for effective international financial management, the determination of foreign exchange rates, international investment, and various securities that are used for financing in international markets.

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## Dept. of Accounting

The Department of Accounting provides an educational foundation for careers in public accounting, cost and managerial accounting, business consulting, corporate finance, and for advancement into higher academic programs through seminar courses and workshops in financial accounting, cost accounting, auditing, taxation, accounting case studies, business statistics and research methodology. Our outstanding faculty is committed to superior teaching, high quality research and significant service to students.

### □ Accounting Major

Accounting majors learn how to gather, record, analyze, interpret, and communicate information about an individual's or organization's financial performance and risks. The accounting curriculum acquaints the student with financial reporting, cost analysis and control, accounting information systems, taxation, auditing theory and techniques. Our doctoral program provides students with rigorous training in accounting, as well as in the related disciplines of economics, finance, statistics, and research methods and ultimately prepares students for scholarly research and teaching.

### □ Courses

#### □ Core Courses

##### • Accounting in Research Methodology (3)

From the accounting study, An empirical studies will be used for the basic concept and methodology by utilize and produce a competence validate research hypotheses which is concern on Financial Accounting, Accounting Management, Tax & Accounting, Auditing, and competencies to be verified and set.

##### • Seminar in Business Statistics (3)

This course is an introduction to techniques of probability and statistics which are useful in business research or practice. The course is designed to give students the basic tools of collecting, analyzing, presenting, and interpreting data in statistical terms.

##### • Seminar in Accounting Research Methodology (3)

This course introduces different methodological techniques related to the conduct



of empirical accounting research. The primary objective of this course is to enable students to develop testable hypotheses and to design appropriate empirical tests to investigate research questions involving financial accounting information, managerial accounting, taxation, and auditing. In addition, the course enables students to investigate methodological issues in the execution of empirical analysis.

- Research Ethics & Thesis Study(3)

This course will focus on ethical issues and dilemmas in the accounting and business environments. The specific objectives of the course are to raise students' general awareness of ethical dilemmas, to place ethical issues within a management context subject to analysis and decision-making action, and to enhance and improve the ability of students to reason toward a satisfactory resolution of an ethical dilemma. Thorough case studies, students will broaden an understanding of the importance and the applicability of ethical rules for accountants and auditors.

- ❑ Accounting Major

- Case Analysis in Accounting (3)

The course studies cases to examine important and timely financial accounting issues providing students the opportunity to hone their approach of analyzing and solving business problems. This course contributes to identifying financial accounting issues.

- Market Based Research in Financial Accounting (3)

The objective of this course is to examine recent empirical/capital markets research in accounting and to provide students with a deeper understanding of accounting information to security market participant. This course covers value relevance and information content studies and the role of the security returns as a tool for validating accounting procedures.

- Accounting Regulation & Policy (3)

This course examines the effect of accounting rules and regulations on firms' operating decisions as well as their influence on accounting choices and practices.

- Seminar in Financial Accounting (3)

The objective of the course is to provide exposure to a blend of traditional and contemporary thoughts/issues in the area of financial accounting. The primary objectives of this course are to expose student to various topics in accounting and to enable students to identify and develop their own research ideas.

- Advanced Topics in Tax Accounting (3)

This course examines controversial issues of income taxation with particular emphasis on choice of entity, income recognition, capital gains and losses, compensation structure, M&As, investment tax planning, and tax management.

- Taxes & Accounting & Business Strategy (3)

The objective of this course is to develop a framework for understanding how taxation affects business decisions and strategies in regard to investments, compensation scheme, organizational forms, and etc.

- Seminar in Auditing (3)

This course examines roles of an auditor and the current audit environment. A conceptual theory of auditing is discussed, and practical examples of auditing techniques are used to illustrate application of theory.

- Advanced Management Accounting (3)

This course focuses on the use of management accounting information in organizations. The emphasis is on understanding the antecedents and consequences of various accounting-based mechanisms such as cost systems, budgets and incentive contracts.

- Accounting Information & Capital Market (3)

This course covers research on the role of accounting information in capital markets. Course topics include market efficiency, the role of accounting in providing information to investors, valuation models, and etc.

- Accounting Information & Economic Organizations (3)

This course introduces the role of financial accounting information in providing corporate controls and motivations among the organization and its stakeholders.

- Management Control System (3)

This course examines management control systems of firms, especially emphasizing on cost analysis, performance evaluation of units and divisions, transfer price, productivity measures, and the study of benchmarking procedures. The goal is to understand the role of management accounting information and its impact on management control and internal control.

- Financial Accounting Theory & Practice (3)

The course introduces accounting theory to explain and predict firms' accounting practices. It provides reasons for observed practice and prediction of unobserved accounting phenomena.

- Positive Accounting Theory (3)

The course studies reasons for underlying financial reporting decisions and auditing practice. This study will help management and accounting personnel to make the optimal business decisions.

- Issue in Financial Accounting (3)

This course provides an introduction to the empirical financial accounting and reporting. This course enables students to acquire and use the financial accounting knowledge and conceptual frameworks to evaluate contemporary issues in financial accounting and reporting through critical readings of accounting research papers and to identify contemporaneous financial accounting and reporting issues, and to formulate research plans to examine those issues.

- Issue in Management Accounting (3)

The course presents an in-depth analysis of recent managerial accounting topics. The course assists students to develop the ability to conduct theoretical and/or empirical research, and further contributes to the advancement of managerial accounting research.

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## Dept. of Data Science

The objective of the Department of Data Science is to enhance professional competence on the basis of sharpen understanding of management, data science, and statistics in turbulent management environment. The curriculum consists of three parts: (1) understanding management theories such as management strategy, business processes, and organization management, (2) acquiring analytics and quantitative methods to complex problems in all areas of business including finance and accounting, and (3) applying fundamental skills and knowledge of business analytics and statistics in a modern organization for improving competitive advantage of companies. We provide a variety of opportunities to students for keeping balance management theory with practical experience via lecture on management principles, practical tutorials, industry-university cooperation through strategic alliance with leading companies in business analytics and data science industries.

Students can differentiate themselves with general knowledge on management disciplines and specialized knowledge on business analytics and statistics. After graduation, the students are expected to be a professional data scientist, business and IT analysts, consultants in business and IT, and general manager in all business areas including finance, accounting, and marketing.

### □ Data Science Major

The goal of Data Science Major is designed to provide an understanding of management, data science, statistics and how business analytics is used for management decisions in organizations. Students will be exposed to a theoretical foundation on management, business analytics, and statistics disciplines. Application of these theories to the success of organizations and to the roles of management, IS professionals, and business analyst will also be presented. This major trains students in the quantitative skills needed for analyzing large-scale data as social media data and real-time and historical data to create more efficient business processes and more accurate decision making, and building more effective business models. Skills taught include statistics, operations research methods, database, data mining, and social mining.

### □ Courses

#### □ Core Courses

##### ·Introduction to Data Science (3)

This course overviews the multidisciplinary aspects of data science, including

business, statistics, and computer science. It introduces basic theories and techniques for decision makers to make effective business decisions drawing on data analytics.

**•Business Statistics (3)**

This course covers mathematics and statistics relevant to management. The topics may include linear algebra, descriptive statistics, etc.

**•Database Management (3)**

This course introduces the basic concepts of database design and data management based on the relational data model. Topics include normalization, relational query language, the Entity-Relationship model, and implementing a database using a personal DBMS such as MS Access.

❑ Data Science Major Courses

**•Multivariate Statistical Analysis (3)**

This course provides an introduction to multivariate statistics. This course will cover multivariate ANOVA and principal components analysis (PCA), multidimensional scaling (MDS), factor analysis and clustering. This course will then study canonical correlation, discriminant analysis, and structural equation modeling or other topics of interest to the students. The course is a mix of theory and hands on application to data.

**•Data Mining (3)**

This course handles the principles and theories of data mining which is essential when looking at the realization of business intelligence. The course is designed to have both theoretical study and practical experiences, and the theoretical study looks at the basics of data mining and various methodologies. In the practice sessions, students are expected to build experience in information gathering and mining through using most widely used business software.

**•Business Service Analysis (3)**

This course teaches the basic knowledge about services such as its concept, role, and competitive strategy, and educates theories and practices related to general service management including service design, service quality, service techniques, supports, service operations, service company's growth and global strategies, etc.

**•Big Data Distributed Processing (3)**

This course provides basic concepts and usage of sourcing and storing big data across a firm. In addition, this course prepares the students for fundamental understanding and monitoring a quality of big data.

**•EDA and Big Data Visualization (3)**

This course introduces EDA(Exploratory Data Analysis)-type techniques to find out the structure and characteristic of data, focusing on visualization methods to summarize big data.

**•Linear Statistical Analysis (3)**

This course is intended to introduce students to generalised linear modelling methods for both discrete and continuous data.

**•Social Network Analysis (3)**

The course offers insights to the concept and fundamentals of analytic techniques of social network. Through the analytic studies and software, students can grasp the real cases of how social network has affected the management and information system.

**•Text Mining and Social Analytics (3)**

This course teaches the basic skills of social media data mining including text mining. Students will learn how to derive business insight through social data analytics.

**•Big Data Integration and Modeling (3)**

This course provides foundation level knowledge that enables effective understanding of big data analytics. It will provide many opportunities for students to address a big data analytics challenge by applying the concepts taught in this class.

**•Business Optimization and Simulation (3)**

In this course, students learn how to develop and analyze strategies by using a variety of techniques from many disciplines including Management Science, Finance, and Accounting.

**•Business Insight and Decision Making (3)**

This course educates decision making procedure and strategy based on decision trees, sensitivity analysis, expected utility models, multi-criteria decision making, game theory.

**•Research Methods for Business (3)**

In this course, students learn about how to scientifically collect, modify, process, store,

and distribute business data and information.

**•Big Data Project (3)**

This course is designed to provide experience of data science process ranging from data collection to usage. This course makes students to apply theories and techniques to real-life case, leading to improved understanding of data science

**•Finance Analytics (3)**

Basic corporate finance models, data stratification tools, and predictive modelling will be introduced to improve decision making in business environment based on financial data.

**•Research Ethics & Thesis Study (3)**

Graduate students will develop an understanding of the nature of ethical decision-making and its role in research ethics. They will also acquire an appreciation of the reasons for conducting ethical review of research and an awareness of the international codes of research ethics that have been developed in response to scandals and abuses in research. Finally, they will understand the nature and definition of research ethics and an appreciation of the importance of good research.

**•R-Programming (3)**

This course fully covers the basic programming language R. Using a variety of R package such as Rcommender, Rattle, Red-R, Rstudio, Rexcel, data analysis including data structure, input and output processing, basic programming, matrix, graphics will be taught.

**•Operation Analytics (3)**

Students will develop an understanding of operational process and study various data mining and data aggregation tools to increase efficiency and reduce cost.

**•Marketing Analytics (3)**

This course covers various data analysis tools to improve marketing decision. Topics include marketing theory, target positioning, and strategy for creating market value and brand concept.

**•Business Model & Strategy (3)**

This course introduces concept, classification, components, development methodology and various cases for business model. Based upon the

understanding of business model, students can practice building business strategy with theory and business cases.

- **Current Trends in Information Technology (3)**

This course provides a broad issues of information and communication technology for Business Analytics in data management, graphics, application packages, and so on to improve capability of data analysis.

- **Analysis of Statistic Data (3)**

In this course, students learn about fundamental research approach to analyze data by using statistical techniques, including basic theories, application of statistical analysis software, data collection, and interpretation of results. Research methodology is also lectured for writing thesis.

- **Research Seminar in Data Science (3)**

This seminar is prepared to educate new trends, issues and techniques of business analytics with discussion, presentation, special lectures by field experts.

- **Introduction to e-Business (3)**

Regarding the current and future e-business environments, this course covers how and why various e-business models survive or perish. Its goals are to: 1) provide the basic understanding of value proposition underlying the business model, 2) understand management issues such as key logistics, organizational and financial aspects, and 3) understand technology enablers such as IT technology.

- **Management Information System (3)**

This course examines the significance and evolution of the MIS field as an academic discipline. Students also learn various subjects regarding MIS such as the concepts and structures, planning, development, operation, evaluation, and control of information systems.



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## Dept. of Mathematics

The Department of Mathematics offers excellent Graduate courses designed to meet the needs of students pursuing graduate work in mathematics and related areas leading students to professional excellence in mathematical research or applications of mathematics.

The Department of Mathematics offers programs leading to Master of Science (M.S.), the Doctor of Philosophy (Ph.D.) degrees, and Master's & Doctoral. Courses of study are available in algebra, analysis, topology, geometry, applied mathematics, cryptography, information mathematics, and probability theory.

The M.S. degree program is designed to prepare students for industrial, management or public service employment. It emphasizes the skills, attitudes, and knowledge needed for recognition, formulation and solution of real-world problems. It also encourages a more intensive program which emphasizes the skills needed for study of problems arising in areas related to mathematics. In addition, students are expected to undertake a project or problem-solving seminar as part of their studies.

The Ph.D. program consists of intensive course of study designed for the full-time student planning a career in research in academic or in a nonacademic setting. The program consists initially of the course work necessary to pass the Qualifying Examinations and then the research necessary to write an original piece of mathematics for a thesis and eventual publication in scholarly journals.

### ☐ **Courses**

#### ☐ Core Course1s

##### • **Research Ethic&Thesis Study(3)**

Graduate students will acquire an appreciation of the reasons for conducting ethical review of research and an awareness of some of the international codes of research ethics that have been developed in response to scandals and abuses in research. Finally, they will understand the nature and definition of research ethics and an appreciation of the importance of good research.

##### • **Modern Algebra (3)**

Elementary algebraic structure of Groups, Rings, Fields, Vector Spaces, Fundamental concepts of Category and Functions.

##### • **Real Function Theory (3)**

This lecture concerns the Lebesgue measure in 1-dimensional real space, integration and differentiation, Riesz representation theory, and existence and uniqueness of regular measure.

- **Basic Topology (3)**

An introductory course of general topology. Fundamentals of point set topology with a brief introduction to the fundamental group and related topics, topological and metric spaces. compactness and connectedness, separation properties, local compactness, completeness, introduction to function spaces, basic notions involving deformations of continuous paths.

- **Foundations of Geometry (3)**

Deals with basic theories in various areas of Geometry on 3 dimensional Euclidean space.

- **Mathematical Statistics (3)**

This course deals with Distribution theory of Random variables, estimation, statistical test, nonparametric statistical methods.

- **Introduction to Applied Mathematics (3)**

Introductory course of applications of mathematical theories and methods in many areas of Science & Engineering.

- **Introduction to Information Security (3)**

Topics covered include need for security services in computer networks, basic concepts of cryptology, historical ciphers, modern symmetric ciphers (DES, IDEA, RC5), Advanced Encryption Standard (AES), public key cryptography (RSA, elliptic curve cryptosystem), hash functions. digital signature.

- **Topics in Modern Algebra (3)**

A Study on the structure of groups, rings, fields and modules.

- **Real Analysis (3)**

In this course, we consider the Lebesgue measure in 1-dimensional real space, integration and differentiation, Banach space, functional space, general function theory, and integration and measure in abstract space.

- **Modern Differential Geometry (3)**

Deal with Tensor analysis, concept of the modern differential geometry and topological properties.

- **General Topology (3)**

Fundamentals of point set topology, topological and metric spaces. compactness and connectedness, separation properties, local compactness,

completeness, Topology of Euclidean spaces, winding number and applications, the fundamental group and covering spaces.

- **Topics in Statistics and Probability (3)**

Seminar on topics of modern statistics and probability theory.

□ Mathematics Major Courses

- **Probability Theory (3)**

This course deals with conditional probability, concept of probability process, Limit actions, Markov chain, Markov process.

- **Topics in Abstract Algebra (3)**

Topics in abstract algebra.

- **Functional Analysis (3)**

We study the linear topological space, Banach-Steinhaus theorem, Open mapping theory, Closed graph theory, Hahn-Banach theorem, and duality in Banach space.

- **Topology (3)**

Topological and metric spaces. compactness and connectedness, separation properties, Euler characteristic, simplicial complexes, the classification of two-dimensional manifolds, vector fields, and introduction to three-dimensional topology.

- **Actuarial Mathematics (3)**

This course assumes basic theory of probability and deals with death rules, life insurance and annuity, reserve fund, continuous and discrete insurance theory.

- **Topics in Financial Mathematics (3)**

Derivatives and options in modern financial market based on probability and probability process, probability differential equations, Black-Scholes model, Hull-White models.

- **Topological Geometry (3)**

This lecture is an account of the elementary theory of topological spaces and of continuous and differentiable maps leading up to the smooth manifolds and their tangent spaces and Lie groups and Lie algebras. Here the geometric algebra provides numerous significant examples.

- **Topics in Topology (3)**

Studies on recent papers relative to the subject general topology, algebraic topology, combinatorial topology, and their applications.

- **Differential Geometry (3)**

Deal with theory of curve and surfaces and the basic of the transformation.

- **Differentiable Manifolds (3)**

Deal with Stokes theorem, Frobenius theorem, Affine connection, Lie group, Cohomology on manifold.

- **Topics in Geometry (3)**

Introduce the recent topics concerning papers.

- **Multivariate Statistical Analysis (3)**

Topics includes discriminant functions, factor analysis, principal components, canonical correlations, and cluster analysis. maximum likelihood and Bayesian methods, robust estimation and survey sampling.

- **Theory of Probability (3)**

Deals with Random spaces, random variables, expectations, moment generating functions, characteristic functions.

- **Topics in Numerical Analysis (3)**

Deals with numerical methods to find approximate solutions for mathematical problems in science or engineering.

- **Applied Differential Equations (3)**

We consider the applications of differential equations and related examples and their solutions in Engineering.

- **Topics in Scientific Computations (3)**

This course deals with computational theory and algorithms based on mathematical theory.

- **Theory of Field (3)**

Structure of Finite Fields, Polynomials over Finite Fields, Theoretical Applications of Finite Fields, Finite Extension Fields, Galois Theory, Ordered Fields, Theory of valuations, artin Schreier theory.

- **Commutative Algebra (3)**

Rings and Ideals, Modules, Localizations, Primary Decomposition, Integral Dependence and Valuations, Chain Conditions, Noetherian Rings, artin Rings, Discrete Valuation Rings and Dedekind Domains, Completions, Dimension Theory.

- **Algebraic Number Theory (3)**

Principal Ideal Rings, Elements integral over a ring, Integrally Closed Rings, Norms and Traces, Noetherian Rings and Dedekind Rings, Ideal Classes and the Unit Theorem, The splitting of prime ideals in an extension field, Galois extensions of number fields.

- **Group Representation Theory (3)**

An introduction to Group representations and character theory, Modular representations, Integral representations.

- **Advanced Algebra (3)**

Topics covered include advanced algebraic theory of elliptic curve cryptosystem and cryptography over Number-Field for public key cryptosystems.

- **Complex Analysis (3)**

This lecture considers analytic function, infinite series, line integral, conformal mapping, Dirichlet problem, and elliptic functions in Complex analysis.

- **Partial Differential Equations (3)**

The purpose of this lecture is the classification, boundary value problems, initial value problems of second ordered partial differential equations as well as the existence and regularity of general linear partial differential equations.

- **Topological Vector Space (3)**

Local Convexity, Hahn-Banach Theorem, Compactness, Klein-Milman Theorem, Conjugate space, Polar Set.

- **Operator Theory (3)**

This course deals with Banach Algebras, topology and density theorem in operator algebra, Von Neumann Algebras.

- **Introduction to Inverse Problems (3)**

We study the concept of layer potential, Neumann and Dirichlet functions, and Generalized Polarization Tensors, and consider the detection algorithm of inhomogeneities embedded in a material by using the asymptotic expansion formula.

- **Topics in Inverse Problems (3)**

We consider the concept of MULTiple Signal Classification (MUSIC) algorithm, linear sampling method, topological derivative, and Newton's method by using Frechet derivative in inverse problems, and study the method of numerical simulations.

- **Elements of Differential Geometry (3)**

Deal with Tensor analysis, classical and modern differential geometry.

- **Submanifold Theory (3)**

Deal with Riemannian manifold, submanifold, complex and contact manifold.

- **Differential Manifolds (3)**

Deal with the fiber bundle on manifolds, connection theory, Green theorem and the integral formula, geometric transformation, Laplace operator, complex and contact manifolds.

- **Riemannian Geometry (3)**

Deal with structure transformation, differential forms, submanifold theory.

- **Topics in Differential Geometry (3)**

Deal with recent topics on the differential geometry concerning to the high level course.

- **Differential Topological Geometry (3)**

Deal with the differential structure using the topological property on differential geometry.

- **Algebraic Topology (3)**

An introductory course with emphasis on the algebraic topology of manifolds. Topics include singular homology theory, Eilenberg-Steenrod axioms, simplicial and cell complexes, elementary homotopy theory, Lefschetz fixed point theorem.

- **Homology Theory (3)**

This lecture is to present as a clearly and concisely as possible the basic techniques and application of homology theory. The subject matter includes singular homology, attaching spaces and CW complexes, cellular homology, cohomology, products, and fixed point theory for the topological manifolds.

- **Homotopy Theory (3)**

This lecture is an introductory course to the algebraic topology from the point of view of a homotopy theorist. In first few sections are introductory in nature. These are followed by a discussion of the fundamental group, covering spaces, and Van Kampen's theorem. Many results which are most often state in the category of CW complexes are valid in this generality. The key result we used to make calculation is the Blakers\_Massay theorem. This is strong enough to imply the suspension theorem and Serre exact sequences.

- **Differential Topology (3)**

We prove embedding, isotropy and transversality theorems, and discuss, as import techniques, Sard's Theorem, Morse functions, partition of unity, dynamical systems. We also consider connected sums tubular neighborhoods and so on.

- **Fuzzy Topology (3)**

This lecture is to present the basic techniques and application of fuzzy topology. The subject matter includes operations on lattices, fuzzy topological spaces and convergence theory, connectedness, separation and compactness. Metric spaces and relations between fuzzy topological spaces and locales are also included in the subject.

- **Theory of Discrete Distribution (3)**

Probability generating functions, Poisson distribution, mixed discrete distribution, multivariate discrete distribution.

- **Nonparametric Statistics (3)**

This course deals with locally most powerful rank tests, regression and analysis of variance using ranks, asymptotic power and efficiency, goodness of fit tests, permutation tests and randomization.

- **Analysis of Time Series (3)**

Decomposition of series, trends and regression as a special case of time series, cyclic components, smoothing techniques, stochastic difference equations autoregressive schemes, moving average, covariance structure and spectral densities.

- **Analysis of Regression (3)**

Correlation theory, distributions of correlation coefficients, Least square method, linear and nonlinear regression, optimal curves.



- **Statistical Decision Theory (3)**

Utility theory, Loss theory, Bayesian analysis, minimum and maximum analysis.

- **Data Analysis and Statistics Laboratory (3)**

Deals with theories and methods for data analysis including linear and nonlinear regression, Time series analysis and Computer experiments.

- **Numerical Methods for Differential Equations (3)**

We study the numerical solution for ordinary differential equations of  $n$ -th order, Laplace, Heat, and wave equations with initial-boundary conditions.

- **Finite Difference Methods (3)**

This course deals with theories of finite difference methods focused on the stability, convergence and their applications in initial value problems or boundary value problems.

- **Introduction to Image Processing (3)**

Throughout the level set, calculus of variations, Euler-Lagrange equation, total variation minimization problems, regularization, and CFL conditions, we understand the structure of partial differential equations and theory of numerical analysis and study the application of image processing such as image denoising and segmentations,

- **Computational Fluid Dynamics (3)**

This course deals with theories of dynamical fluids and computational methods for models that can not be solved analytically.

- **Chaos and Dynamical Systems (3)**

This course deals with iterations, graphic analysis, chaos, stability.

- **Topics in Mathematical Models (3)**

This course deals with theories, mathematical and numerical methods for various mathematical models.

- **Finite Element Methods (3)**

This course deals finite element methods in one and two dimension spaces and error analysis.

- **Option Pricing (3)**

Deals with evaluations of options, futures, swaps derived from Stocks, Bonds

and VaR.

- **Mathematical Models for Computation (3)**

Deals with Finite automata , Pushdown automata, Turing machine, Recursive Functions and introduce various mathematical models for computation.

- **Queueing Theory (3)**

Deals with Single server queues, M/M/1, M/G/1, G/M/1, G/G/1, Heavy traffic, Networks of queues.

□ Information Security Major Courses

- **Cryptomathematics (3)**

Topics covered include finite fields for information security. The structure of finite field, polynomials over finite field, factorization of polynomials, applications of finite fields, ECC over finite fields.

- **Crypto-Algorithm (3)**

Topics covered include classical cipher, stream cipher based on Shannon's theory, block cipher and their security issues.

- **Advanced Crypto-Algorithm (3)**

Topics covered include the design and implementation of public key cryptosystem, symmetric key cryptosystem, digital signature schemes, hash functions.

- **Logic of Information Flow (3)**

Topics: languages and models of the first order, terminological representation languages, logical models for solving scheduling problems

- **Mathematics and Information (3)**

Deals with uncertainty, Entropy, Coding Theory based on Statistics and Probability.

- **Information Security Protocol (3)**

Topics covered include an introduction of information security protocol, key distribution, identification, message authentication code, secret sharing, pseudo-random number generation, zero-knowledge proof, electronic elections.

- **Key Management System (3)**

Topics covered include the key generation, key management, and key recovery schemes.

- **Electronic Commerce Security (3)**

Topics covered include information security schemes to protect the electronic commerce, especially electronic cash, electronic payment, electronic wallet.

- **Hash Function and Message Authentication (3)**

Topics covered include the design principle of collision free hash functions and the generation of MAC.

- **Cryptanalysis of Public - Key Cryptosystem (3)**

Topics covered include the cryptanalysis of public key cryptosystem based on the mathematical methods such as factorization of numbers, discrete logarithm problems.

- **Complexity and Algorithms (3)**

Topics: running time analysis, efficient algorithms, the class P, the class NP, computability theory, complete theories.

- **Provable Security (3)**

Deals with Computational complexity, Unconditional security, Complexity theoretic security, Provable security under assumptions, Ad hoc security.

- **Steganography and its Applications (3)**

We study the implementation Technology and Principle of Steganography, and Information Hiding Application Method, such as Watermarking and DRM, etc.

- **Networks Security (3)**

Deals with Authentication systems, Entity authentication, Security handshake pitfalls, Strong password protocols, Kerberos system, Public key infrastructure, IPsec.

- **Financial Information Security (3)**

We study the information Security Technology in Financial Field, such as Electronic cash, Secure Electronic Transaction, and Internet Banking Systems, etc.

- **Topics in Symmetric Key Cryptanalysis (3)**

We study the security analysis on the block ciphers and stream ciphers.

- **Implementation of Cryptographic S/W (3)**

Acquire the software implementation technologies of International standard Symmetric Key Encryption Algorithm and public key Encryption Algorithm.

- **Implementation of Cryptographic H/W (3)**

Studying about current technology for H/W structure and optimal implementation on crypto-device.

- **Evaluation and Validation of Cryptographic Module (3)**

Studying about the knowledge necessary to perform the evaluation verification guideline on the basis of understanding for the Cryptographic Module Validation Program (CMVP).

- **Implementation of Parallel Cryptography (3)**

Studying about the High Speed Implementation technology on crypto algorithm using the GPU or Parallel systems, and its applications.

- **Mobile Security (3)**

Studying about the latest mobile networks security architecture and technology.

- **Wireless Security (3)**

Studying about the latest wireless communications technology, and the security technology of the applications.

- **IT Convergence and Security (3)**

Studying about Convergence Technology on IT field and other fields, and the security technology of the applications.

- **Smartgrid Security (3)**

Studying about structure and security required for application on SmartGrid.

- **Internet Security (3)**

Studying about structure of Wired and wireless Internet, and its security technology.

- **Side Channel Attacks (3)**

Studying about physical security analysis of the smart devices.

- **Countermeasures of Side Channel Attacks (3)**

Secure implementation of the side channel attack countermeasures based on S/W and H/W

- **Secure Multiparty Computation (3)**

Studying about technology that can protect the privacy of the participating entity under an environment that does not assume the existence of a trusted server.

• **Pseudorandomness (3)**

Studying about the theory of Pseudorandom Number which is a basic Security factor Of cryptographic algorithms, and the Method of Statistical Randomness Test.

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## Dept. of Physics

Physics is a fundamental science aimed at discovering the basic principles governing our universe, and applying these to the everyday life. Most of today's scientific knowledge is based on the laws of physics, and therefore Physics is considered to be one of the most fundamental fields in the science and engineering and has broad impacts in the real world. The education and research goal of the Department of Nano and Electronic Physics is to explore the quantum phenomena in the nanometer scale, to apply the principles of Physics to the electronic systems, and to cultivate the manpower needed in the 21st century industry. The research and education within the department will be performed by carrying out the cutting-edge experiments and developing new methods to overcome the limitations of the conventional methodologies in nanometer scale. The department also focuses on the theoretical and numerical studies on the physical phenomena in the nanometer region.

The department of Physics consists of 11 faculty members who are actively pursuing researches on many forefront fields in physics and providing high-quality education. The main research topics include physics of magnetic material, geometrical optics, plasma physics, computational condensed matter physics, semiconductor physics, surface physics, and nanoelectromechanical systems. The department offers the educational program which encourages the students to study the multidisciplinary aspects of nanoscience through the various courses offered by the department. Also for students, many research opportunities will be available through on-going research programs in the department.

### ☐ Courses

#### ☐ Core Courses

##### • **Classical Mechanics (3)**

Classical Mechanics is a field of physics which describes the motion of the macroscopic bodies including celestial objects like star and everyday machineries. In this course, Lagrangian and Hamilton mechanics based on Hamiltonian theory in the classical mechanics will be studied in depth. The scope of the subject will include not only the typical aspects of classical mechanics area but also small oscillation, collision of two particles and relativistic theory.

##### • **Electrodynamics (3)**

Electrodynamics deals with the physical phenomena related to electric and magnetic field and related dynamics of the fields and the dynamics of the charged particles. The scope of the subject includes time independent and

dependent electric fields in vacuum and in dielectrics, magnetic fields associated with constant and variable currents, magnetic materials, Maxwell's equations, electromagnetic wave propagation in medium, generation of electromagnetic wave, relativistic 4-vector treatment of electromagnetic entities.

- **Quantum Mechanics (3)**

Quantum Mechanics is a fundamental subject which is backbone of the modern science. The course will introduce quantum mechanical concepts like operators, expectation value, wave function, etc. The course will also discuss angular momentum operators, harmonic oscillator problem, atomic hydrogen problem, perturbation theory, scattering theory, identical particles, radiation, second quantization, etc.

- **Physics Research Ethics & Thesis Study (3)**

Survey& overview the impact of Physics and Physics research result on society and scientific community with ethical point view. And Suggest sound research approach.

□ **Physics Major Courses**

- **Solid State Physics (3)**

Solid State Physics deals with the many aspects of the solid state materials, including semiconductors, magnetic material. Physical properties of solid state material will be discussed with both classical and quantum mechanical theories. The scope of the course will cover atomic, molecular and crystal structure, energy levels of electrons, and binding energies in molecules and solids, etc.

- **Advanced Solid State Physics (3)**

Advanced Solid State Physics is an advanced course for the student who has background on the graduate level solid state physics. The course will mainly focus on the quantum mechanical phenomena in the solid state material. The scope of the course will include band theory, superconductors, magnetism of matter, heat capacity of materials and optical properties of solids, etc.

- **Statistical Mechanics (3)**

Statistical Mechanics is a fundamental subject in the physics which deals with collective many-body phenomena in nature. The course will introduce the concepts of micro-canonical ensemble, canonical ensemble, grand-canonical ensemble, free energy, entropy, chemical potential, partition function, etc. Also, the course will introduce the equilibrium thermodynamics and elementary

statistical mechanics. The knowledge of Statistical Mechanics is essential to the understanding of the modern solid state physics of semiconductor and magnetic material.

- **Advanced Statistical Mechanics (3)**

Advanced Statistical Mechanics is for the student who are familiar with the basic Statistical Mechanics. In the course, the advanced subjects of statistical mechanics like advanced thermodynamics, superfluids, Ising model, phase transition and Landau theory will be studied. Introductory non-equilibrium theory is also another topic to be discussed in the course.

- **Mathematical Physics (3)**

Firm knowledge of mathematics is very important in the study of the physics since many theoretical works on physics are expressed in mathematical equations, graphs, and mathematical models. This course is to provide the basic background and skills in mathematical physics which is needed for the further study and research in physics. The scope of the course will include Ordinary Differential Equation, Complex Variable, Calculus of Variation, Numerical Method, etc.

- **Advanced Mathematical Physics (3)**

This course presents the advanced topics in mathematical physics which is essential for the understanding of the current researches in Physics. The course is for students who are familiar with the basics of graduate-level mathematical physics. Especially, the students majoring in theoretical physics are required to take this advanced course. The scope of the course will include Special Function, Integral Transforms, Integral Equation, Green's Function, group, etc.

- **Computational Physics (3)**

The course presents the computational techniques and software development skills. Also, the students will learn network and software development tools including parallel batch processing systems, code management systems, debuggers and optimizers, auto documentation generators, and web utilities. Computational Physics is closely related to the success of the modern computational material physics.

- **Semiconductor Physics (3)**

Semiconductor is very essential to the success of the modern solid state electronic devices including integrated circuits, transistors, diodes, LEDs, etc. The physical properties of the semiconductors are subjects of study in



Semiconductor Physics course. Since semiconductor is also a solid state material with well defined crystal structure, basic knowledge of solid state physics is required. The scope of the course will include lattice vibration, band structure and conductivity of semiconductor, etc.

- **Advanced Semiconductor Physics (3)**

Advanced Semiconductor Physics course is for the students who have graduate level knowledge on the semiconductor physics. The topics covered in the course are interface of semiconductor, optical absorption, semiconductor laser, amorphous semiconductor and doping effect. Forefront research topics and issues of the semiconductor physics will be also discussed in the course.

- **Nuclear Physics (3)**

This is an introductory course for the graduate student who are interested in the nuclear physics. The physical phenomena in the nuclei will be understood with the aid of quantum mechanics and other theories. Angular momentum, decay of nucleus, energy level of nuclei, transition, gamma ray and other nuclear physics topics will be discussed in the course. Not only the theories but also the experiments and experimental techniques will be discussed in the course.

- **Advanced Nuclear Physics (3)**

Main purpose of advanced nuclear physics course is to introduce the nuclear structure. Nuclear reaction, scattering theory, nuclear reaction model will be discussed. Especially, this course will focus on the theory of nuclear force, ground state neutron, proton scattering. Also, topics on nuclear fission and fusion with reactor theory and power generation by fusion will be presented.

- **Advanced Classical Mechanics (3)**

In this course further canonical formalism development begins by introducing Hamilton-Jacobi theory. Classical theory of fields is also presented. Examination and comparative understanding of classical field concept will be discussed to provide a unified view of classical and quantum mechanics. The prerequisite for this course is at least one semester of post graduate level classical mechanics.

- **Advanced Electrodynamics (3)**

The main topic of this course is electromagnetic radiation and its interaction with matter. Outline of the course is electromagnetic wave generation, propagation in a medium, its interaction with medium, dielectric loss, electromagnetic properties and various phenomena in optics. Four vector

formalism and covariant vector of relativity will also be presented.

- **Advanced Quantum Mechanics (3)**

Main purpose of this course is to put together the principles of relativity and quantum theory that are necessary to perform calculations of the electromagnetic scattering of electrons and positrons, as well as, the emission and absorption of photons. Second quantization, Dirac equation, calculation of covariant perturbation, elementary process of scattering will be presented. At least one semester of post-graduate level quantum mechanics is prerequisite to this course.

- **Spin-spectroscopy (3)**

The interpretation of micro spin structure of materials will be introduced. The role of the microscopic spin structure in the nonvolatile data storage, quantum computer, magnetic sensor are studied. Application of spin technology for micro electronic devices and nano electronic devices is manipulated.

- **Spin and Nano Physics (3)**

Spin and Nano Physics is a course designed to introduce the basics of the nano materials and devices. Following the brief introduction of the nano materials and device, the course discusses the theoretical and experimental works on the physical phenomena in nanostructures and their applications in the field of spintronics.

- **Advanced Material Physics (3)**

This course discusses the advanced topics in material physics, which is not covered in post-graduate level material physics and its goal is to help students to be familiar with fore-front of material physics. Topics are new magnetic materials, ferroelectric materials, optical device materials, nano-structured material and left-handed materials. Prerequisite is graduate course on material physics.

- **Magnetism (3)**

This course begins with the basic concept of magnetism. Topics of this course covers diamagnetism, paramagnetism, ferromagnetism, antiferromagnetism, Curie-Weiss law, Zener's super exchange model, Anderson's double exchange model and application to oxide materials. Basic of magnetic spectroscopy with neutron and X-ray is also presented. Prerequisite for this course is undergraduate course of solid state physics.

- **Advanced Magnetism (3)**

This course presents the advanced topics in magnetism, which is not covered in post-graduate level magnetism course and its goal is to help students to be familiar with fore-front works on the field of magnetism. Topics are new magnetic materials such as GMR, CMR, diluted semiconductor, Multi-ferroic materials, and nano-magnetic particles. Prerequisite is graduate course of magnetism.

- **Plasma Physics (3)**

This course provides the student with the basic theory of plasma, which covers atomic collision, Maxwell Boltzman distribution, Debye screening, glow discharge process, frequency dependence of plasma, interaction with electromagnetic waves, plasma-solid interaction and Beam plasma. Prerequisite for this course is one semester post-graduate level classical electrodynamics.

- **Methods in Experimental Physics (3)**

This is the lecture about the methodology in physics experiments. In this lecture, students are asked to study various fields in experimental techniques including electrical circuits, vacuum technique, glass work, machining job. etc. Various kinds of electrical instruments are utilized in modern physics experiments. Thus thorough understanding of the electrical instruments and electrical circuits used in physics experiments is very important and it will be discussed in detail. Other techniques like vacuum technology will also be reviewed. Typical experimental methods in physics will also be presented and discussed.

- **Advanced Plasma Physics (3)**

This course discusses the advanced topics in plasma physics, which is not covered in post-graduate level plasma physics and its goal is to help students to be familiar with the fore-front of plasma research. Some topics on Magneto hydrodynamics (MHD) and instability theory, fusion plasma, space plasma will be presented. Special emphasis on plasma reactor design for low temperature semiconductor process is discussed.

- **Modern Optics (3)**

This course covers reflection, refraction, Snell's law, paraxial approximation, converging and diverging lens, thick lens, thin lens, magnification, mirror, design of an Achromatic Doublet, Driving mirror, magnifying glass, spectacles glass, camera, telescope, and microscope. Special emphasis on optical

instrument design with commercial simulation package is spared.

- **Quantum Optics (3)**

This course begins with basic tools of quantum optics such as Atom-field interaction

- **Quantum Field Theory (3)**

This course covers quantum electrodynamics, Feynman diagram and gauge field theory from the classical theory of fields describing field aspect of electromagnetic coupling, Yukawa coupling, Feynman rules, renormalization, non-abelian gauge field theory. Prerequisite to course is one semester post-graduate level quantum mechanics and advanced quantum mechanics.

- **Physics of Crystal Diffraction (3)**

This course covers basic crystallography, classification of solids, group theory, basic theory of X-ray diffraction, kinematic theory, dynamical theory, Debye Waller line broadening, Reliability factor, diffuse scattering, and neutron diffraction to crystalline solid. Prerequisite to course is one semester undergraduate level solid state physics and electromagnetism.

- **Physics of Thin Films (3)**

This course focuses on the physical aspect of thin films. Thin film has different characteristics, which cannot be found in bulk. Starting from the basic principle of various growing, the course discusses modern thin film growing method such as PECVD, LPCVD, MOCVD, ALE and its physical, chemical and mechanical properties. Important analytical tools for film characterization (XPS, AES, SIMS, and XRD) are also presented.

- **Advanced physics of Thin Films (3)**

This course is intended to serve as an advanced course on thin films and their properties as well as their applications. In addition, the growth mechanism of thin films and various film growth techniques such as PECVD, LPCVD, and MOCVD will be discussed in depth. Especially, this course focuses on various physical properties of superconducting, metallic, semiconducting, magnetic thin films.

- **Crystal Growth (3)**

This course introduces the theory of crystal growth. The topics include Czochralski crystal growth, float zone crystal growth, epitaxial crystal growth, and atomic layer crystal growth as well as general introductions to crystal and

crystal growth. We will look at the physical mechanisms of crystal growth in light of modern technologies with emphasis on their applications in nanotechnology.

- **Topic in Solid State Physics (3)**

This is a special course on solid state physics. Rather than discussing the general theories of solid state physics, this course focuses on topics in solid state physics, which are not covered in regular courses on solid state physics. This course also discusses the advanced topics on modern solid state physics theories and experiments with emphasis on mesoscopic and microscopic systems.

- **Topic in Magnetism (3)**

This is a special course on the physics of magnetism and magnetic materials. Rather than discussing the general theories of magnetism, this course focuses on topics in magnetism, which are not covered in regular courses on magnetism. This course also discusses the advanced topics on modern physics of magnetism and magnetic materials such as spintronics and multiferroic materials as well as their applications.

- **Topic in Semiconductor (3)**

This is a special course on the physics of semiconductor and semiconducting materials. Rather than introducing the general theories of semiconductor, this course focuses on topics in semiconductor, which are not covered in regular courses on semiconductor. This course also discusses the advanced topics on modern physics of semiconductor and semiconducting materials with emphasis on applications in the field of nanotechnology.

- **Topic in Plasma (3)**

This is a special course on physics of plasma. Rather than introducing the general theories of plasma physics, this course focuses on topics in plasma physics, which are not covered in regular courses on plasma physics. This course also discusses the advanced topics on current plasma physics theories and experiments with emphasis on their applications in modern technologies.

- **Research in Magnetism (3)**

This course presents the current topics in physics of magnetism. This course introduces current theories in the field of magnetism and offers chances to review some of experiments such as spintronics and dilute magnetic semiconductors. This course is intended for a small group of students involved

in various research projects to discuss the current topics in magnetism, which are actively pursued in the field of magnetism and their applications.

- **Seminar in Solid State Physics (3)**

This course consists of a series of weekly presentations of current research topics in solid state physics. This course is designed to expose students to the topics and excitement of the research frontier. Each lecture will be given by a different researcher who will describe his/her field and his/her own work. Also each student will be given a chance to present a research paper related to solid state physics.

- **Applied Optics (3)**

This course is intended to serve as a graduate level introductory course on optics. This course focuses on introducing general theories of optics such as geometric and physical optics, aberrations, optical instrumentation, interference, and polarization in optics. In addition, brief description of current researches in optics and their applications in modern technologies will be presented.

- **Advanced Applied Optics (3)**

This course is intended to serve as a graduate level advanced course on optics. Based on general theories of optics such as geometric and physical optics, aberrations, optical instrumentation, interference, and polarization in optics, this course will discuss the advanced topics in optics research. Also, this course will present applications of optics in the fields of nanotechnology and biotechnology.

- **Mossbauer Spectroscopy (3)**

The Mossbauer spectroscopy has been one of the key research techniques in the field of magnetism. The Mossbauer spectroscopy allows the understanding of fundamental physical processes in magnetic materials. This course introduces basic theories of Mossbauer spectroscopy and its applications. This course is intended for students, who are planning to research in the field of magnetism.

- **Advanced Mossbauer Spectroscopy (3)**

This is an advanced course on Mossbauer spectroscopy. This course discusses the advanced topics on Mossbauer spectroscopy and its applications in the field of magnetism. This course describes the fundamentals of Mossbauer effect and operation principles of Mossbauer Spectroscopy. This course also teaches the interpretation of Mossbauer measurements.

- **Surface Physics (3)**

This course is intended to serve as a graduate level course on the surface physics. This course describes the fundamental physical processes on surfaces. Also, this course covers the basic theories of surface physics and their applications. In addition, this course describes the various analysis methods on the solid surface using ARS, SIMS, XPS, AFM, SEM, TEM and RBS.

- **Semiconductor Process (3)**

This course introduces the physical properties of semiconductor devices and fabrication processes of amorphous and crystalline semiconductor devices. In addition to the introduction of the basics of semiconductor physics, this course presents technological aspects of semiconductor processes such as crystal growing, vacuum technology, diffusion barrier and amorphous process.

- **Quantum Solid State Physics (3)**

This is an advanced course on solid state physics. This course is intended for students, who are planning to research in the field of both theoretical and experimental solid state physics. Especially this course focuses on the quantum theories of solid and reviews some of experiments in light of those. The topics include phonons, lattice specific heat, neutron scattering in solids, Landau diamagnetism, de Hass Alphen effect, and energy band theory.

- **Topic in Surface Physics (3)**

This is a special course on surface physics. Rather than introducing the general theories of surface physics, this course focuses on topics in surface physics, which are not covered in regular courses on solid state physics. This course also discusses the advanced topics on current surface physics theories and experiments with emphasis on their applications in modern technologies.

- **Topic in Optics (3)**

This is a special course on optics. Rather than introducing the general theories of optics, this course focuses on topics in optics, which are not covered in regular courses on optics. This course also discusses the advanced research topics on current theories and experiments in the field of optics, with emphasis on their applications in modern technologies.

- **Research in Semiconductor (3)**

This course presents the current topics in physics of semiconductor. This course introduces current theories in the field of semiconductor and offers

chances to review some of experiments. This course is intended for a small group of students involved in various semiconductor research projects to discuss the current topics, which are actively pursued in the field of semiconductor research and their applications.

- **Research in Plasma (3)**

This course presents the current topics in physics of plasma. This course introduces current theories in the field of plasma and offers chances to review some of experiments. This course is intended for a small group of students involved in plasma research projects to discuss the current topics in plasma physics, which are actively pursued in the field of plasma research and their applications.

- **Seminar in Semiconductor (3)**

This course consists of a series of weekly presentations of current research topics in semiconductor physics. This course is designed to expose students to the topics and excitement of the research frontier. Each lecture will be given by a different researcher who will describe his/her field and his/her own work. Also each student will be given a chance to present a research paper related to semiconductor physics.

- **Seminar in plasma (3)**

This course consists of a series of weekly presentations of current research topics in plasma physics. This course is designed to expose students to the topics and excitement of the research frontier. Each lecture will be given by a different researcher who will describe his/her field and his/her own work. Also each student will be given a chance to present a research paper related to plasma physics.

- **Magnetic Hyperfine Spectroscopy (3)**

This course consists of a series of weekly presentations of current research topics in nuclear solid state physics. This course is designed to expose students to the topics and excitement of the research frontier. The energy splitting of hyperfine interaction related to zero phonon state, Debye temperature, gamma ray resonance will be introduced. Also each student will be given a chance to present a research paper related to solid state physics.

- **Research and Seminar in Magnetic hyperfine (3)**

This course presents the current topics in physics of hyperfine interaction on magnetism. This course introduces current theories in the field of magnetism



and offers chances to review some of experiments such as magnetic semiconductors and multifunctional materials. This course is intended for a small group of students involved in nano?magnetism research projects to discuss the current topics in magnetism. Each lecture will be processed by seminar and discussion on current special topics.

• **Research in Optics (3)**

This course presents the current topics in physics of optics. This course introduces current theories in the field of optics and offers chances to review some of experiments. This course is intended for a small group of students involved in optics research projects to discuss the current optics topics, which are actively pursued in the field of optics research and their applications.

• **Seminar in Optics (3)**

A series of weekly presentations of current research topics in optics. This course is designed to expose students to the topics and excitement of the research frontier. Each lecture will be given by a different research who will describe his/her field and his/her own work and each lecture will be processed by seminar and discussion on current special topics.

• **Seminar in Nano Solid Spectroscopy (3)**

This course will introduce emerging nano materials and structures as well as measurement and spectroscopy techniques in sub-micron region.

• **Advanced Magnetic Field Theory (3)**

Magnetic field theory will be explored for application of magnetic properties of a solid. Molecular field theory, direct exchange interaction, super exchange interaction, double exchange interaction will be introduced. On basis of those theories, ferromagnetic, anti ferromagnetic, ferrimagnetic order will be studied.

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## Dept. of Chemistry

The department offers a full range of courses in physical & analytical, organic, inorganic, nano and biochemistry. In response to the changing nature of chemistry, our department provides outstanding opportunities for advanced study in chemistry. In addition to our interests in education, chemistry faculty members pursue vigorous and productive research in many chemistry-related applied fields, such as sensors, displays, nano electronic materials, industrial application of biomolecules, and etc. The link between teaching and research is a vital factor in a continuously evolving scientific subject; it ensures that students will be provided with optimum information and concepts, and provides opportunities for students to participate in practical research.

### ☐ Physical and Analytical Chemistry Major

Physical and Analytical Chemistry is a subject dealing with the physical properties and analyses of all matter. Physical Chemistry is concerned with microscopic/ macroscopic, atomic/subatomic and particulate phenomena in chemical systems with respect to physical science. It generally uses the principles, practices and concepts of thermodynamics, quantum chemistry, statistical mechanics and kinetics. Analytical chemistry is the science to analyze morphologies, compositions, and quantities of analytical targets. It also deals with a variety of practical applications, such as biomedical applications, environmental monitoring and quality control of industrial manufacturing.

### ☐ Organic Chemistry Major

The graduate program 'Organic Chemistry' has several purposes. First, it provides the basic understanding of organic molecules properties which lead to synthesis, isolation, and characterization. Second, it offers the research experience and course work required for careers in teaching, chemistry-related industry, government laboratories, or other postgraduate professions. Third, it gives students the opportunity that relate with biological sciences.

### ☐ Inorganic Chemistry Major

Inorganic chemistry is a subject dealing with the chemistry concerned with the synthesis, properties and behavior of inorganic compounds. This field covers all chemical compounds except the organic compounds (compounds containing hydrocarbons). Major areas of inorganic chemistry include Solid-State and Materials Chemistry, Organometallic Chemistry, Bioinorganic Chemistry, Coordination Chemistry and Nanoscience.

## ❑ Biochemistry Major

The program in Biochemistry major in the Department of Chemistry is committed to achieving excellence in graduate studies and research. The lectures and seminar courses in the biochemistry major covers in-depth understanding as well as industrial application of biomolecules. In addition, emerging techniques and knowledge in life science are discussed with special focus on drug development, biotechnology, and nano-bio chemistry.

## ❑ Nano Chemistry Major

Nanochemistry is a subject dealing with the chemistry of making, analyzing, and applying substances that are active in the nanoscopic world in which substances are measured in one billionths of a meter. Nanochemistry, while serving as the basis for various sciences and technologies, is a very broad field involving life sciences, energy, electronics, environment, and materials. So, the new discipline of nanochemistry has already made it possible for us to step into the world of superfine substances, first-hand observations of and work with molecules and atoms on a nano-meter scale, including biomolecules and other functionally advanced materials.

## ❑ Courses

### ❑ Core Courses

#### • **Advanced Organic Chemistry (3)**

Elementary general molecular orbital theory. Reaction Mechanism. Carbocation and carbanion reactions. Carbonyl addition. Oxidation, reduction, rearrangements. Organic photochemistry.

#### • **Advanced Analytical Chemistry (3)**

This is a lecture designed to explain the most important issues in modern analytical chemistry. Topics include the principles, instrumentations, and applications of spectroscopy, electro-chemistry, separations, mass spectroscopy and chemical sensing.

#### • **Advanced Inorganic Chemistry (3)**

Topics include atomic and molecular structure, chemical bonds, solvent systems, reactions of the elements and their compounds.

#### • **Advanced Physical Chemistry (3)**

This is a course meant for graduate student majoring physical chemistry related fields. The course will develop a fundamental understanding of the principles of

thermodynamics, kinetic theory, statistical mechanics, quantum chemistry and molecular spectroscopy.

- **Advanced Biochemistry (3)**

This subject gives an opportunity to understand the life science by dealing with Enzyme structure and mechanism, protein modification, signal transduction in sensory systems, DNA and RNA biochemistry, and biochemistry of disease.

- **Research Ethics & Thesis Study (3)**

In this Subject, students study all the possible ethical issues in scientific researches and how the researchers deal with social responsibilities.

❑ Physical and Analytical Chemistry Major Courses

- **Intorduction of Photoelectrochemistry (3)**

This course introduces the fundamental concepts of photoelectrochemistry and demonstrates various applications.

- **Advanced Photoelectrochemistry (3)**

The goal of this course is understanding the advanced theoretical concepts in photoelectrochemistry on the basis of prerequisite subject.

- **Special Topics in Photoelectrochemistry (3)**

This course introduces state-of-the-art research trends in the field of photoelectrochemistry.

- **Energy Chemistry (3)**

This course introduces the concept and theory about the change and accumulation of energy especially placed in the electrochemical reaction. Students can learn the manufacture and analysis of related in an element.

- **Chemical Instrumentation (3)**

This course is designed to developing the knowledge and skills of instrumental analysis. Students are qualified to learn electronics / machining / optics / data analysis.

- **Applied Analytical Chemistry (3)**

This course is designed to apply the analytical methods to real issues including environmental science, forensic science, and food analysis.

- **Spectrochemical Analysis (3)**

Students will fulfill the determination of chemical structures on the basis upon the interpretation of infrared absorption, Raman scattering, UV/Vis absorption, nuclear magnetic resonance, and mass spectra, comparing with the chemical literature.

- **Statistical Thermodynamics (3)**

This course deals with the concepts of microstates, ensembles, partition functions, and fluctuations in quantum statistics. The issues are related to thermodynamic properties of ideal gases and crystals, chemical equilibrium, and phase transitions.

- **Special Topics in Advanced Quantum Chemistry (3)**

This lecture is designed to explain the concept of quantum chemistry extensively. Students are required to solve the Schrodinger's equation, and to understand the electronics structure of atoms and molecules.

- **Molecular Spectroscopy (3)**

The course will explore the interaction of light with matter. We will start with the quantum mechanical foundations of spectroscopy and follow with a detailed treatment of a variety of different spectroscopies, including the study of rotation, rotation and vibration, and electronic spectra for simple molecules as well as polyatomics.

- **Chemical Kinetics (3)**

Topics include relation between rates and mechanisms of chemical reactions, collision theory of reaction rates, activated complex theory, theory of unimo-lecular processes, classical dynamics of reactive scattering, elastic scattering, quantum theory of inelastic scattering or equivalent curve crossing processes, and experimental methods.

- **Electrochemistry (3)**

Students will learn the theories and applications of electrochemical methods including chronoamperometry, chrono-potentiometry, cyclic voltammetry, coulometry, polarography, and potentiometry.

- **Special Topics in Physical Chemistry (3)**

Students will learn the classical topics such as kinetics and photochemistry, macromolecular and surface chemistry, molecular spectroscopy, electric and magnetic properties of matter.

- **Research in Physical Chemistry (3)**

An upper-level student in good standing is urged to pursue an experimental research in physical chemistry with the guidance of any member of the chemistry faculty chosen.

- **Research in Analytical Chemistry (3)**

An upper-level student in good standing is urged to pursue an experimental research in analytical chemistry with the guidance of any member of the chemistry faculty chosen.

- **Seminar in Physical-Analytical Chemistry (3)**

To aid students in learning to speak well publicly. The focus is on discussing in physical and analytical chemistry topics from journal articles appeared in recent year.

- Organic Chemistry Major Courses

- **Organic Synthesis (3)**

Systematic consideration of reaction which allows carbon-carbon bond formation or cleavage, as well as the introduction, removal, interconversion, or transposition of functional groups.

- **Organic Reaction Mechanism (3)**

Understanding of bond and structure changing in organic chemistry.

- **Stereochemistry (3)**

Configurational and conformational analysis of molecules: the steric course of organic chemical reactions.

- **Heterocyclic Chemistry (3)**

Fundamental understanding of heterocyclic reactivity and synthesis, particularly aiming at recent works.

- **Natural Products Chemistry (3)**

The logic which may be applied to designing synthesis of complex molecules in the context of a comparison of in vivo and laboratory synthesis of natural products synthesis including alkaloids, amino acids, fatty acids, macrolides, porphyrins, prostglandins, sreroids, and terpenoids.

- **Advanced Polymer Chemistry (3)**

Mechanism of polymer reactions, preparations of addition and condensation polymers, properties of polymer, and the chemical reactions of polymers.

- **Free Radical Chemistry (3)**

Focusing on new development of radical chemistry. Bond formation, rearrangement, electron transfer, addition, elimination, and substitution reaction will be discussed.

- **Organic Analysis (3)**

Lectures on determination of structure of organic compounds involving separation techniques and the application of FT-IR, UV, and visible spectroscopy, nuclear magnetic resonance spectroscopy, mass spectrometry, and other modern instrumental techniques.

- **Special Topics in Organic Chemistry (3)**

Lectures on advanced topics in organic chemistry presented by staff or visiting lecturers.

- **Research in Organic Chemistry (3)**

Independent research for graduate students for degree in chemistry.

- **Seminar in Organic Chemistry (3)**

Detailed study of a special topic in organic chemistry under the guidance of a faculty member.

- **Inorganic Chemistry Major Courses**

- **Science and Technology for reduction of Green house gases (3)**

The character of green house gases and method of detecting it.

The chemical method about isolation and purification from emission source.

The production method of fuel and high added-value chemical production from exchanging Green house gases.

- **Current Research topics: Energy (3)**

This lecture involved in many seminar about the problem of energy which human encounter today. The invited lecturer and professor will discuss how to resolve the problems via conference.

- **X-Ray Diffractometry (3)**

The principles and practice of the determination of structures by single crystal x-ray diffraction techniques. Crystal symmetry, diffraction, structure solution and



refinement. Opportunities for hands-on experience in structure determination.

- **Organometallic Chemistry (3)**

Principles of electronic structure and bonding in organometallic species will be handled, related to reactivity patterns in common systems. Preparation and characterization methods of organometallic compounds, having applications to catalytic and stoichiometric organic syntheses, will be presented.

- **Special Topics in Inorganic Chemistry (3)**

A lecture course in inorganic chemistry in areas of specialization of the faculty, with emphasis on current developments. Specific topics will be changed from semester to semester, so a student may take the course for credit more than once.

- **Research in Inorganic Chemistry (3)**

An upper-division student in good academic standing is urged to pursue an experimental research in inorganic chemistry with the guidance of any member of the chemistry faculty chosen.

- **Seminar in Inorganic Chemistry (3)**

To aid students in learning to present well publicly, the class is focused on discussing in inorganic chemistry topics from journal articles appearing in recent years.

□ **Biochemistry Major Courses**

- **Biotechnology for Conservation Ecology**

The foundation of Biotechnology

The comprehension to photosynthesis that is a immobilization process of CO<sub>2</sub>

The comprehension to CA enzyme related to production of carbonic acid and of process of CO<sub>2</sub> collection from using it.

The comprehension to methane monooxygenase (methane switch enzyme).

The comprehension to methane switch strain and of the process of methanol production.

The comprehension to enzyme and strain of alcohol production from switching alkane.

The comprehension to Conservation Ecology Skill via the reduction technology of green house gases using enzyme and strain.

- **Enzyme Chemistry (3)**

This subject studies general properties of enzyme reactions such as enzyme

activity, substrate specificity, and biocatalysis using an enzyme as a biocatalyst in chemical reaction.

- **Bioscience (3)**

The aim of this subject provides information of principle of life phenomenon taking place in animal, plant, and microorganisms.

- **Protein Engineering (3)**

This subject will provide essential knowledge for understanding various protein engineering techniques to create novel and improved protein functions, recent trends of protein engineering, and applications of engineered proteins for scientific, medical and industrial purposes.

- **Proteomics (3)**

This subject studies combinatorial function network of total proteins in organisms on the basis of interpreting the relationships between proteome and its functions.

- **Chemical Biology (3)**

This subject deals with physiological functions of small chemical compounds.

- **Structural Genomics (3)**

This subject deals with functional analysis of life on the basis of structure interpretation of proteins translated from genome.

- **Research in Biochemistry (3)**

Graduate students in good standing are urged to pursue an experimental research in biochemistry with the guidance of any member of the chemistry faculty chosen.

- **Seminar in Biochemistry (3)**

To aid students to give a speech publicly in classes. The focus is discussions of biochemistry topics from journal articles published in recent years.

□ Nano Chemistry Major Courses

- **Display Material Chemistry (3)**

This course teach how to deal chemical method used in developing display material.

- **Advanced Material Chemistry (3)**

This course teaches how to deal with advanced chemical methods used in developing new advanced materials as an advanced course of material chemistry.

- **Material Chemistry (3)**

Chemistry has a vital role to play in materials processing and in the development of new materials. This course is concerned with the basic underlying principles and the technological relevance of major topics in advanced material chemistry. This course includes organic, inorganic, solid-state, and surface chemistry as well as polymer and materials science.

- **Thin Films (3)**

This course includes the developments in the physical and chemical sciences that have changed the design, manufacture, and analysis of thin films, and their applications, especially in communications and information processing, storage, and display.

- **Electronic Materials (3)**

This course is concerned with the basic underlying principles and the technological relevance of major topics in electronic material chemistry. This course deals with various electronic materials such as organic, inorganic, and polymers.

- **Solid State Chemistry (3)**

Solid state chemistry has emerged as a very important element of mainstream chemistry and modern materials science. This course is concerned with the synthesis, structure, and properties and applications of solid-state materials. Understanding of solid-state chemistry is also essential in materials design.

- **Surface Nano Chemistry (3)**

Introduction to the behavior of molecules adsorbed on solid surfaces: the structure of surfaces and adsorbate layers. The bonding of molecules to surfaces: adsorbate phase transitions: trapping and sticking of molecules on surfaces. An introduction to surface reactions: kinetics of surface reactions. A review of principles of chemical reactivity: reactivity trends on surfaces: prediction of rates and mechanisms of reactions on metals, semiconductors, and insulators.

- **Research in Nano Chemistry (3)**

Upper division students in good standing are urged to pursue an experimental

research in nanochemistry along with the guidance by faculty members.

• **Seminar in Nano Chemistry (3)**

The course focuses on discussing in nanochemistry topics from journal articles appearing in recent years. This course can provide much opportunity to learn how to efficiently communicate scientific knowledges to the public.

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## Dept. of Foods & Nutrition

The Dept. of Foods and Nutrition offers academic programs regarding healthier living. The program involves technological aspects of high quality and safe food production and a wide variety of subjects linked to human nutrition. The MS and Ph.D programs in the department of Foods and Nutrition are specialized for nutritional science and food biotechnology. The areas of study include nutrient metabolism, nutritional requirements, nutrient-gene interactions, clinical nutrition, and a variety of bioactive compounds in food and natural resources. Students will develop a strong background and practical skills through research projects. Graduates from this program possibly construct a career as a nutritionist and a researcher in the field of product development, evaluation, and analysis.

### ☐ Food and Nutrition Major

The graduate program in Food and Nutrition major is a continuation of the undergraduate degree program, but with further development of research skills in specific areas of nutrition and food science as well. Food and Nutrition major provides students with training in normal and therapeutic nutrition, biological and social sciences, biochemistry, physiology, food science, nutrigenomics, food service management, communication, public policy, experimental design and statistics, and epidemiology.

### ☐ Food Biotechnology Major

Food Biotechnology major emphasizes the integrated application of several disciplines of chemistry, microbiology, and biotechnology to the processing and manufacturing of foods. This program also provides a strong research background for biological sciences and engineering to food systems.

### ☐ Courses

#### ☐ Core Courses

##### • **Advanced Nutrition (3)**

Literature of human nutrition related to macronutrients and micronutrients covers metabolism, genetics, physiology, biochemistry, endocrinology, and epidemiology.

##### • **Advanced Food Science (3)**

The course deals with chemical, physical, and biological properties of food components and their application in food system.

- **Experimental Design and Statistics (3)**

The course covers sampling theory, sample survey design, experimental and epidemiological study designs, descriptive statistics, statistical distributions and estimation, and statistical inference and tests including z-test and t-test for one sample, analysis of differences in two means, simple linear regression, and a chi-square goodness of fit test.

- **Seminar in Foods and Nutrition (3)**

The course deals with issues in area of food and nutrition based on current literature.

- **Research Ethics & Thesis Research (3)**

Graduate students will develop an understanding of the nature of ethical decision-making and its role in research ethics. In particular, students, who participate in researches using animal models or human biospecimens or whose researches include human participants as study subjects, will acquire information on the Enforcement Decree of Bioethics and Safety Act and Animal Protection Act. They will also acquire an appreciation of the reasons for conducting ethical review of research and an awareness of some of the international codes of research ethics that have been developed in response to scandals and abuses in research.

- Food & Nutrition Major Courses

- **Advanced Biochemistry (3)**

A comprehensive treatment of biochemistry and molecular biology stressing structures of biological molecules, including proteins, nucleic acids, carbohydrates, and lipids, enzymology, and selected aspects of metabolism and bioenergetics.

- **Nutrient Metabolism (3)**

Regulatory mechanisms of nutrition and metabolism, including current genetic theories on metabolic controls and their dysfunction in human health.

- **Nutritional Physiology (3)**

The course deals with the effects of nutrients on human organs including nervous, muscular, respiratory, circulatory, digestive, renal, endocrine, and reproductive systems.

- **Nutrition in Disease (3)**

The course covers epidemiological, clinical, animal, molecular, and cellular studies linking diet and diseases including cancer and heart disease. Biochemical and physiological mechanisms by which nutrients prevent disease are dealt with.

- **Nutrition and Development (3)**

Relationship of nutrition to growth and development of brain and other human organs. The course covers the application of basic principles of nutrition to nutritional and physiological needs throughout the life cycle from prenatal to aging. The interaction between physical and behavioral or psychological factors is emphasized.

- **Lipid and Carbohydrate (3)**

Literature of human nutrition related to lipid and carbohydrate covers metabolism, genetics, physiology, biochemistry, endocrinology, and recent nutritional problems.

- **Protein and Amino Acids (3)**

Literature of human nutrition related to protein and amino acids includes metabolism, physiological function, biochemistry, endocrinology, and recent nutritional knowledge.

- **Vitamins and Minerals (3)**

Literature on human mineral nutrition includes molecular biology, physiology, and epidemiology with special emphasis on the role of minerals and vitamins in optimal health.

- **Advanced Clinical Nutrition (3)**

Critical examination of nutritional intervention strategies used in clinical settings. Emphasis is placed on systematic analysis of nutrition-related disease problems and interventions designed to address the problems.

- **Topics in Nutritional Assessment (3)**

Interpretation of information obtained from dietary, biochemical, anthropometric, and clinical techniques as well as physical examination: principle of precision, accuracy and interpretation of results for individuals and populations.

- **Nutrition and Environment (3)**

Understanding of nutritional ecology. Topics include interactions between human and environment, population growth and regulation, interaction of genetic and

ecological processes, and ecosystems.

- **Topics in Nutrition Counseling (3)**

Advanced study of nutrition counseling in health and disease care with nutrition professionals and counseling tools for successful management and delivery of nutrition services, including knowledge of nutrition assessment, planning, implementation and evaluation as related to nutritional care.

- **Topics in Food Preparation (3)**

The course deals with basic knowledge of food components and applied scientific principles in food preparation and production.

- **Food Service Industry (3)**

The course deals with factors affecting food production and service in the food service industry emphasizing adherence to food quality and service.

- **Nutrition and Immunity (3)**

Cellular and molecular mechanisms underlying interactions of nutrition and immune function, including modulation of immuno-competence by diet and effects of immune responses on nutritional needs. Lectures and discussion explore implications for resistance to infection, autoimmunity, and cancer.

- **Cultural Aspects of Foods and Nutrition (3)**

Historical and contemporary overview of culture, food habits, and diet: exploration of the major themes in food habit research: origins and development of dietary practices: the anthropological approach to food and diet: field work methods: case histories that explore food patterns and their nutritional implications.

- **Society and Nutrition (3)**

Nutrition problems in contemporary communities and of selected target groups. Nutrition programs and policy, principles of nutrition education issues and problems related to community-based nutritional assessment: ethical issues in human investigation.

- **Aging and Elderly Nutrition (3)**

Interaction between nutrition and aging. Topics include physiological/biochemical basis of aging, age-related changes affecting nutritional requirements, assessment of nutritional status in the elderly, and relationship between developmental nutrition and the rate of aging.



- **Nutritional Epidemiology (3)**

Epidemiological methodology in relation to nutritional measures of human populations: review of the current state of knowledge regarding diet and other nutritional indicators as etiologic factors in disease. Topics include study design, sources of inaccuracy in experimental and observational studies, the methodology of data collection, and an introduction to the statistical evaluation of epidemiological data.

- **Interaction of Nutrients (3)**

Study of nutrient-nutrient and nutrient-drug interactions in metabolism. The course covers physical nutrient-drug complexation, effects of drugs on nutritional status, nutrient-induced drug toxicity, and drug-induced nutrient depletion.

- **Policy of Foods and Nutrition (3)**

Practical and theoretical basis for analyzing, critiquing and designing a variety of policies and programs aimed at tackling food supply, nutrition and hunger problems. Major areas of change in food consumption pattern and dietary habits is explored under different socio-economic and political conditions.

- **Food Service Organization (3)**

The course deals with application of management functions and principles to food service organizations. The course also covers evaluation of food products and commercial equipment.

- **Advanced Food Service Management (3)**

The course deals with principles of menu development, food production, service, delivery, procurement, sanitation, safety, and equipment selection in food service management.

- **Mass Media and Dietary Behavior (3)**

The course deals with skills and methods to analyze information concerning nutrition and life science in the media.

- **History of Food & Dietary Behavior (3)**

The course deals with basic knowledge of the food consumption and food culture in geographical and historical insights. Students will study food economically, behaviorally, socially and culturally, looking at how different societies have procured sustenance and how they have attached different meanings to what they consume.

#### ❑ Food Biotechnology Major Courses

- **Fermentation Technology (3)**

The study of microorganisms associated with food fermentation and principles in the processing of fermented foods.

- **Advanced Food Chemistry (3)**

The course deals with various aspects of food components and consequences of the properties on food processing. The course also covers mechanism of physical?chemical reaction affecting food qualities and their reaction products.

- **Advanced Food Microbiology (3)**

Review on the recent progress in microorganisms associated with natural and processed foods. Topics include characteristics of bacteria, fungi and yeasts associated with foods, foodborne disease, utilization of microorganisms for food processing.

- **Food Quality Management (3)**

The course deals with principles, methods and techniques involved in evaluating food quality and management.

- **Topics in Food Hygiene (3)**

Food service sanitation, providing training in the regulation and procedures necessary to prevent food poisoning and foodborne diseases in a food service establishment.

- **Advanced Food Preservation (3)**

The course deals with major causes of food degradation and fundamental principles of food preservation. The course also covers methods of shelf-life testing and ways to improve shelf life.

- **Topics in Food Products (3)**

The course deals with unit operations used in food processing and physical?chemical changes of food undergoes during processing.

- **Food Toxicology (3)**

The course deals with principles of food safety and toxicology including foodborne infection and poisoning. The course also covers food protection criteria and regulations surrounding food additives.

- **Instrumental Analysis (3)**

The course deals with principles and application of modern instruments used for the analysis of biological substance.

- **Food Quality Evaluation (3)**

The course deals with objective and subjective methods for sensory evaluations of foods and application of statistics in food quality control.

- **Assessment of Food Safety (3)**

The course deals with chemical, microbiological, physical hazard associated with food consumption. The course also covers issues on microbiological risk assessment(MRA).

- **Functional Foods (3)**

The course deals with definitions of functional foods and regulatory arena surrounding functional foods, as well as the efficacy and safety of selected functional substance. The course also covers application of functional substance in variety of functional food products.

- **Food Products Development (3)**

The course deals with interrelationships of processing principles and chemical and physical properties in the development of new and improved food products.

- **Food & Consumers (3)**

The course deals with factors affecting the food supply and management of consumer resources from the perspectives of food consumer.

- **Food Enzymology (3)**

The course deals with the nature, role, and applications of enzymes in food industry. The course also covers production, isolation and kinetic behavior of enzymes in food processing.

- **Sensory Evaluation of Foods (3)**

The course deals with detail sensory evaluation methods from panel selection to consumer testing methods. The course also covers basic experimental design and statistical analysis.

- **Advanced Molecular Biology (3)**

The study focused on gene structure and function at the molecular level, including gene structure, replication, transcription, translation and regulation of gene expression.

• **Food Biotechnology (3)**

Study on applications of various biotechnology to food processing, including genetic engineering, enzyme technology, cell culture technology and biochemical engineering.

• **Gene Manipulation (3)**

The course deals with basic concepts of DNA manipulation and their application in food industry.

• **Research Method in Foods and Nutrition (3)**

The course deals with principles and methodologies of recent research related to foods and nutrition.

• **Advanced Sensory Science (3)**

This class deals with current and advanced topics in sensory science area, such as sensometrics, psychophysics, mechanisms of sensory perception and cognition, and consumer studies. Students will be encouraged to read the latest research papers, and participate in the discussion in class.

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## Dept. of Bio and Fermentation Convergence Technology

Bio and fermentation technology generally deals with the production of functional biomaterials by mass cell culture and thus is related to many disciplines. It is one of main subjects of green industry which is recently gaining much attention as a driving force for the future. Although some courses of bio and fermentation technology have been offered by many related departments, they are supporting general subjects of the main discipline of the department. The Department of Bio and Fermentation Convergence Technology at Kookmin University is unique in offering the program that focuses on every aspect of bio and fermentation technology. The program is organized multidisciplinary and covers not only biological sciences but also engineering, design and human sciences. Specific area include bio- and medicinal-material technology, microbial fermentation technology, food biotechnology, bioenergy engineering, cold preservation technology, systems biology and advanced physiology. The Department has exchanging and collaborative education and research programs with the Robert Mondavi Institute for Wine and Food Science (RMI) at University of California at Davis (UCD) and Korea Research Institute of Bioscience and Biotechnology (KRIBB).

### ☐ Courses

#### ☐ Bio and Fermentation Convergence Technology Major Courses

- **Advanced Biochemistry (3)**

This subject studies the bio-chemical process in living organisms. It deals with the structure and function of cellular components and metabolism such as bio-molecules, amino acids, peptides, proteins, carbohydrates, lipids, and nucleic acids.

- **Advanced Biotechnology (3)**

This course covers the recent research trend and technology in the area of bio informatics, gene cloning, construction of genetically modified microorganisms, production of recombinant enzymes in microbial systems and kinetic analysis of recombinant enzymes.

- **Advanced Microbiology (3)**

Studies and discuss on the current research trend in the nutrition, growth, metabolism, physiology, molecular genetics, genomes of diverse microorganisms.

- **Seminar in Bio and Fermentation Convergence Technology I (3)**

Students will not only learn the current issues in bio and fermentation convergence technology but also have an opportunity to practice how to give a scientific talk. The focus will be on the review of journal articles, technical reports, and historical science references concerning bio and fermentation convergence technology.

- **Seminar in Bio and Fermentation Convergence Technology II (3)**

This is the continued course of Seminar in bio and fermentation convergence technology I. However, this differs from I by requiring students' oral presentation of their own research.

- **Advanced Enzymology (3)**

This subject studies general properties of enzyme reactions such as enzyme activity, substrate specificity, and enzyme catalysis.

- **Advanced Microbial Physiology (3)**

Studies and discuss on the current research trend in microbial cell structures, nutrition and growth of microorganisms, strain improvement and development for the production of useful fermented products.

- **Advanced Bioanalytical Chemistry (3)**

The aims of this class are to introduce analytical chemistry and its application in a variety of science disciplines. Topics covered include GLP, GMP, solution chemistry, spectroscopy, chromatography, advanced microbiology techniques and DNA and protein purification/separation techniques. This course emphasizes laboratory skills and knowledge essential for employment in analytical laboratories.

- **Advanced Neuroscience (3)**

The nervous system -the brain, spinal cord, and nerves of the body-is crucial for life and enables you to sense, move, and think. General knowledge in neurobiology, sensory and motor systems, the brain and behavior, and the cellular and molecular basis of learning and memory will be studied.

- **Advanced Molecular Biology (3)**

Studies and discuss on the current research trend in replication, transcription, translation, gene expression, regulation, chromatin structure at molecular level.

- **Advanced Cell Biology (3)**

Studies and discuss on the current research trend in cell structure, organelle function, cellular signal transduction, and tumorigenesis at molecular level.

- **Advanced Immunology (3)**

Studies and discuss on the current research trend in cells and biomolecules that constitute an immune system and their physiological function, and in the development of new immune materials and vaccine.

- **Advanced Mechanical Engineering for Refrigeration System (3)**

This course covers the current status and technology in the area of thermodynamics about food preservation and refrigeration, advanced principles of freeze cycle and design of refrigerator.

- **Advanced Fermentation Process Engineering (3)**

This course introduces recent technology in fermentation process design including various downstream processes. Especially, separation of fermentation products, purification and commercial product manufacturing will be taught.

- **Advanced Fermented Food Processing and Preservation (3)**

Cutting-edge technologies of food safety covering from food production to consumption focusing on various chemical changes during food-fermentation processes will be taught.

- **Advanced Bioenergy Engineering (3)**

This course presents the principles of biomass composition and structures, and various advanced technology for conversion of natural biomass to fermentable sugars and then bioenergy. Especially, new technology including microbial fermentation and enzymatic bioconversion technology for bio-ethanol and bio-diesel production will be taught and discussed.

- **Advanced Bioprocess Design and Management (3)**

New and advanced technology for bio-process design and management will be presented and discussed, which is important for efficient production of bioproducts using biotechnology. By this course, various technology to operate the bioprocesses in biotechnology companies will be learned.

- **Studies on Fungi (3)**

Studies and discuss on the current research trend in physiology, metabolism, genetics, and industrial application of fungi.

- **Special Topics in Metabolic Engineering (3)**

Studies on the basic principles and applications of metabolic engineering for efficient production of value-added biochemicals by modulation of metabolic pathways.

- **Current Topics in Bio Medicinal Materials (3)**

Studies and discuss on the current research trend in pharmaceutical and medical applications.

- **Advanced Bio New Material Technology (3)**

This subject studies the development of bio new materials from GRAS resources for industrial applications.

- **Special Topics in Medicinal Biotechnology (3)**

This lecture covers the state-of-art of the development, evaluation and mass production of new medicinal materials through in-depth understanding of human diseases.

- **Advanced Thermodynamics (3)**

This course covers principles of thermodynamics, and application of these principles to problems of reaction and phase equilibria in pure and mixtures in order to provide insight into physical and chemical phenomena associated with engineering analysis.

- **Advanced Physiology (3)**

Homeostasis refers to stability, balance or equilibrium. It is the body's attempt to maintain the stability of the human body's internal environment in response to changes in external conditions. Nervous System, Endocrine System, Cardiovascular System, Digestive System, Respiratory System and Circulatory System will be studied.

- **Advanced Systems Biology (3)**

Inter-disciplinary field of study that focuses on complex interactions within biological systems, using a more holistic perspective approach to biological and biomedical research

- **Research in Fermentation Convergence Technology (3)**

Researches by convergence of fermentation technology and emerging biotechnology

- **Research in Bioengineering (3)**

Researches by combination of biotechnology and engineering concept

- **Research in Bioconvergence Technology (3)**

Researches by convergence of bioscience and various new technology



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## Dept. of Forest Resources

The science of Forest Resources is an essential basis for economy, environment, and other social and cultural assets in Korea, where 64% of the land is occupied with mountainous forests. In association with enormous benefits produced from the forests, graduate students will find wide and substantive strata for studies on the values, services, and products of the forests. Educational goal for the Department of Forest Resources is to teach students for them to learn professional skills and knowledge that would help to maintain Korea's forest ecosystem healthy in a sustainable manner. The department takes full advantage of the state of the art knowledge and science to achieve this goal. To list a few, biotechnology, remote sensing, GIS (Geographic Information System), ecosystem approaches, and most up-to-date forest survey methods are the disciplines to attain the goal.

**One of the main objectives of the Master and Doctor of Science program in the Forest Resources Major** is to provide ample opportunities for students who aspire to have professional careers. The curriculum offers them a variety of knowledge from the basic to the applied aspects for their specialization, as well as interdisciplinary and global environmental issues such as climate change from ecological and social perspectives. The graduates of the department, in general, are working as public foresters, researchers, or managers of forestry, to name a few.

### ☐ Courses

#### ☐ Forest Resources Major Courses

##### • **Administration of Forestry & Environmental Organization (3)**

The subject is divided into two parts. Part one is that administration in forestry treats of the performance, business operation and implementation policy about public forestlands. Part two provides governmental and non-governmental organization on how environmental policy should be managed in Korea and the related nations.

##### • **Forestry Biology and Silviculture (3)**

Discussion of individual tree structure and growth, physical environment of trees and forests, and introduction to different regional forest communities. Manipulation of forest vegetation based on natural regeneration for the production of goods and services.

##### • **Forest Management (3)**

In this course, principles of forest management for sustained yield system are mainly dealt with. The methodologies of both stand-level management planning and forest-level management planning are presented. The stand-level management planning includes growth and yield modeling, management

decisions, and decision criteria for managing future and current even- and uneven-aged forest stands. In the forest-level management planning, traditional forest regulation concepts, harvesting scheduling, and multiple-use management are discussed.

- **Special Topics in Ecosystem Ecology (3)**

Theories on the structure, function, and development of ecosystems are taught and studies on the energy flow and nutrient cycling are reviewed for further discussion in sustainable management of forest resources.

- **Research Planning in Forest Science (3)**

Students will learn an overall process and system of methodologies in conducting forest science research. Topic selection, research design and planning, literature search and review, actual analysis, delivery and review of results will be covered in this lecture. Students will have an opportunity to practice writing scientific proposals and reports through critical group review.

- **Topics in Forest and Humanity (3)**

Analyzing the impact of forest on cultural development and civilization. Areas of emphasis in history, philosophy, literature, art and religion.

- **Forest and Nature Interpretation (3)**

Development explanation skills about forest and nature, including view of culture, ecology, geography, and scenery. Examination and analysis of overall process required to become 'forest interpreter' and 'nature interpreter'.

- **Tree Growth Development (3)**

Integration of vascular plant anatomy, nutrition, metabolism, and growth regulation specific to wood plants. Major topics include woody plant meristems, structure and function, water relations, internal carbon cycle, and growth regulation.

- **Social Forestry (3)**

Detailed analysis of the influence of the forest on civil society. View of social relation between civil society and forest.

- **Geoinformatics in Forest Resources (3)**

Focuses on the required background for remote sensing, GIS, digital photogrammetry and GPS in the new geoinformatics concept in the discipline-oriented and the methodology-oriented forest applications including introduction to LBS application.

- **Modeling of Forest Socioecology (3)**

Quantitative techniques used in socioecological Forestry. It provides insight into sustainable forest management(SFM) planning of forested lands. From model specification described in spatial information.

- **GIS Application of Forest (3)**

Recent advances in geographic information systems (GIS) to directly address specific analysis or management in forest resources. It includes fundamental scientific problems and decision support tool in GIS applications.

- **Human Impact in Wildlife Ecology (3)**

Presenting the available management of how endangered and threatened species relate to their habits. Details the role of predators in ecosystems and landscape ecology. It deals also with understanding between preservation and hunting which may be used to help manage "desirable" and "undesirable" species.

- **Satellite Environmental Monitoring (3)**

This subject is designed to meet observation techniques of various kinds of earth environment and to promote basic researches to understand the mechanism of the variations of earth environment based on earth observation information from space.

- **Restoration Ecology (3)**

Theories on the restoration and rehabilitation of the structure, function, and development of ecosystems destroyed by anthropogenic as well as natural disturbances are taught and the examples of restored and rehabilitated ecosystems are introduced for further discussion.

- **Tree Resource & Dendrology (3)**

To develop and maximize the potentials for using trees as resources, theories on the classification and identification of trees including the issues on distribution, ecological characteristics, and usages of them are taught. Emphasis is placed on specific usages of trees as medicines, foods, ornaments, and environmental resources for further discussion.

- **Landscape Ecology (3)**

Theories on the structure, function, and development of landscapes including diverse array of ecosystems are taught and practical examples in the preservation of natural ecosystems and conservation natural resources are introduced for further discussion in restoration and rehabilitation of degraded

ecosystems in Korea.

- **Forest and Environment (3)**

Theories on the relationship between forests and air pollutants are taught and measures for mitigating the damages caused by the air pollutants are introduced for further discussion. Emphasis is placed on the diverse aspects including the mechanisms of source-sink and dose-response relationships of air pollutants with forests.

- **Management of Natural Environment (3)**

Theories on the conservation, preservation, utilization, and restoration of natural environment including diverse array of practical application are taught. The ecology and practices in the preservation of natural ecosystems and conservation natural resources are introduced for further discussion in the management, restoration, and rehabilitation of degraded ecosystems and environment in Korea.

- **Management of Plant Resources (3)**

To develop and maximize the potentials for using plants as resources, theories on the conservation, protection, utilization, and preservation of them including botanical and ecological issues on the classification, identification, distribution, habits, and usages of them are taught. Emphasis is placed on specific usages of natural plants in Korea as medicines, foods, ornaments, and environmental resources for further discussion.

- **Special Topics in Environmental Pollution Management (3)**

In order to wisely manage pollutants contained in the trees and the other biotic organisms and the abiotic environment in the air, water, soil, etc., in the forest ecosystems, lectures are focused on the understanding of the dynamics of them and the measures how to control them wisely in view of sustainable management of forest ecosystems.

- **Growth and Yield (3)**

The focus of this course is on discussing the relationship between tree growth and yield. This course deals mainly with principles of growth and yield by species and locality. Based on statistical theory, also, the methodology of developing growth and yield models is lectured throughout actual research case studies. The application method of the models will be discussed for the rational forest management.

- **Forest Mensuration (3)**

This course deals with theory and technique of forest measurement required in

basic data survey for research. The measurement methodology of growth and yield for both individual tree and forest stand will be considered based on advanced theory and computer application. Also, the latest topics in the field of forest measurement will be discussed.

- **Advanced Biostatistics (3)**

This course investigates the advance statistical theories and methodologies relevant to biological studies. Methodologies such as hypothesis testing, correlation analysis, regression analysis, analysis of variance, time-series analysis are covered, and will provide effective tools, theoretical backgrounds, and statistical programming skills for academic research.

- **Environmental and Resource Economics (3)**

This course provides a variety of critical perspectives on how current environmental issues. Students will learn how to view environmental problems under an economic perspective, with particular focus on efficient and general usage and management of forest resources, and to develop models to handle such issues.

- **Experimental Statistics (3)**

This course emphasizes on statistical application to research problems of forestry. The contents of lecture include basic concepts of statistical models, use of samples, measures of variation and central tendency. Statistical analysis techniques such as test of hypothesis, analysis of variance, regression and correlation are discussed with actual research data. Also, the technique of computer programs will be provided to enhance the ability of statistical analysis.

- **Planning for Forest Landscape (3)**

This course is designed to understand the social demand for forests and development activity, and propose a model for solving problems through providing a plan for constructing aesthetic landscape and recreational space. In this procedure, students have to research the possibilities of mountain forests in historical and ecological aspect. Based on these observations, they will approach to the spatial planning in harmony with mountain forest environment.

- **Special Topics in System Engineering in Forestry (3)**

This study deals with some big issues concerning forest road, tree harvesting, mountain erosion control. Especially, it focuses on relationship of forest road with tree harvesting and mechanization, forest labor and ergonomics, hydrological

and civil engineering against erosion in mountain forest area.

- **Design Theory for Forest Trails (3)**

This lecture is close related to special topics in forest system engineering and forest landscape planning. Students review forest management, tree harvesting, forest recreation, and then research how to plan and design the forest management trail and the forest recreational trail as forest road, logging trail, recreational trail, nature experience trail, etc.

- **Recreational and Tour Planning for Mountain Communities**

In order to cope with forest tourism demand in mountain region, Students will learn the possibilities of mountain forest in aspect of mountain community and ecology. Thereafter they study how to approach to the recreational planning and designing in harmony with mountain forest area.

- **Design of Forest Healing and Therapy (3)**

Forest therapy is a activity physically and spiritually promoting the human health through physiological, sensory, and mental response between human organs and various natural factors(landscape, sound, aroma, phytoncide, negative ions, light, climate, topology, etc) in forests. This course deals with healing mechanism and application methods of elements related to forest healing and therapy.

- **Environmentally Sound Site Planning (3)**

In accordance with increase of social demand for forest developments, the woodlands in the area of suburb are seriously opened up and it damages the forest landscape quality visually and emotionally. This subject deals with issues caused by such engineering works as forest road, golf ground, ski slope, quarry, etc., and harvesting and logging operations. It aims to find out some methods which can environmentally and soundly restore the damaged woodland sites.

- **Forest Genetics (3)**

To understand principal concepts of forest population genetics, molecular genetics, and ecological genetics and apply these genetic concepts for making decisions in tree improvement and species conservation & management strategies .

- **Forest Pathology (3)**

To obtain knowledge on basic concepts of forest pathology and identify major forest diseases in the world, especially Korea and US. And, to understand the impact of forest disease under climate change scenarios.

- **Forest Genetics and Pathology (3)**

This course is designed to understand the ecological roles of biological and environmental factors that cause the disease in forests and develop approaches for predicting, preventing, and managing tree pathogens. Methods to identify forest pathogens and examine host-pathogen interactions will be reviewed for applications to maintain forest health, sustainability, and resilience of diverse forest ecosystems.

- **Forest Molecular Biology (3)**

Concepts and methods of advanced forest molecular biology research will be discussed for potential application of population genetics, phylogenetics, and genomics/transcriptomics to maintain forest health and conservation.

- **Forest Health Management (3)**

Major topics covered by the course include forest pest (disease and insect) and fire, how these factors interact with each other and their environment within forest ecosystems, and how to manage healthy forests for sustaining resilient forest ecosystems.

- **Disturbance Ecology (3)**

Ecological disturbances are critical in understanding the dynamic nature of ecosystems and vegetation change. Disturbances can occur in a variety of spatial and temporal scales, with varying intensity and frequency. Such characteristics can play an important role in determining the structure and function of any particular ecosystems. In this course, students will learn the theoretical background and current research on disturbance ecology, with a chance to experience several quantitative and modeling approaches.

- **Spatial Analysis and Statistics (3)**

Ecological phenomenon is often dynamic and heterogeneous across time and space. Such diversity and heterogeneous nature of ecological phenomena has drawn significant interest in the field of ecology. This course will provide several important theories on spatial analysis and statistics, along with practical training on how to use actual statistical tools and programs to conduct the relevant analyses.

- **Ecological Modeling (3)**

Forest ecology consists of various components and relationships among them, and its functional characteristics are determined by the complex interactions between such components. Modeling approach is a useful tool to understand such complex systems, and to predict and/or project system behaviors, and to facilitate planning for management. This lecture will provide theoretical



background and practicum for various existing modeling platforms and modeling approaches in the field of forest ecology.

- **Ecological Management and Ecosystem Service Valuation (3)**

Ecosystem service indicates the totality of the various benefits ecosystem provides to humankind. For sustainable development and ecological conservation, it is critical to understand ecosystem service and properly evaluate its values to assist decision making. This lecture provides the fundamentals of the concept of ecosystem service, tools to evaluate and model ecosystem service, and real-world examples on how this approach is applied.

- **Special Topics in Urban Ecology (3)**

Urban ecology is a study of the complex system of human, flora and fauna, natural and artificial environments, their organizations, and the interactions between the components. Sustainable urban management can only be possible with the consideration of the unique characteristics of the urban ecosystem. This lecture provides the theoretical background of the nature of the urban ecosystem components, their dynamics and interactions, and provide the mainstream perspective to critically assess sustainable urban planning.

- **Special Topics in Climate Change (3)**

Climate change is one of the major change we face, now and in the future. It will influence not only the atmospheric condition of the Earth, but the entirety of the ecosystem and how humans live. Due to the complexity of the phenomenon, the outcomes of climate change can be unpredictable and complicated. This lecture provides the advanced scientific foundation of climate change, and how it will influence human livelihood and ecological integrity of the biosphere.

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## Dept. of Forest Products & Biotechnology

In master's course of forest products, the advanced programs are provided on the utilization of forest products concerned with environment-friendly green materials, bio-based chemicals, and energy ranging from total nature product acquired by the forest. Especially Department offer the contents which include the biotechnological conversion science and utilization of forest biomass for energy and bio-products, the wood science and utilization such as Wood-based building materials and timber engineering, and paper science & engineering, paper conservation science and environmental analysis in the field of paper science.

### ☐ Courses

#### ☐ Forest Products & Biotechnology Major Courses

- **Seminar in Wood Engineering (3)**

Presents and discusses theoretical and technological investigation of the wood-based material and engineering.

- **Seminar in Wood Chemistry (3)**

The purpose of this seminar is to understand a trend of all about wood chemistry. For example, spectroscopy, organic chemistry, tree biochemistry, wood extractives chemistry and wood polymer science. After studying this lecture, we hope that students will understand all about wood chemistry.

- **Seminar in Forest Products (3)**

Presents and discusses the theoretical and technological investigation of the forest science, and forest products science and engineering.

- **Application Statistics in Forest Products (3)**

The main topic of class is the statistical analysis for the scientific research. Collection, analysis, and interpretation of scientific data for the research and utilization of natural resources will be introduced and practised.

- **Experimental Design (3)**

Better understanding of fundamental notions of statistics and explanation of important principles of experimental design make good use in forest products research. Moreover, regression, correlation, and dispersion analysis are closely managed in order to work as a base to assist having better understanding of and analyzing the consequences of the computer program.

- **Research Ethics & Dissertation Study (3)**

Instruct specific areas including the theme selection, experimentation, framing of a dissertation and research ethics. It will cover the identification of the research problem, problem solving approaches and results, literature survey, and thesis formats. This course will also provide opportunity to become involved in graduate research, under guidance of a supervisor, on a problem of mutual interest to student and supervisor.

- **Advanced Wood Physics (3)**

Specific gravity and moisture content variation affecting the physical properties, and movement of water at the fiber and wood will be discussed. And wood in relation to heat, etc. will be also discussed.

- **Advanced Timber Design & Mechanics (3)**

Selected problems will be outlined in the field of design procedures for the glued laminated members, panel products and built-up members. Elastic theory for the stiffness and strength, and buckling resistance of composites will be discussed.

- **Advanced Wood Mechanics (3)**

This course deals with the wood as an engineering materials affecting design of wooden members. Emphases are on the stress-strain relations for non-isotropic materials, influence of density, defects, and glued laminated constructions.

- **Advanced Engineered Wood (3)**

Recent topics on engineered woods such as specialty plywood, particleboard, fiberboard, glued laminated wood, laminated veneer lumber, and newer developments such as laminated or oriented strand lumber, laminated veneer board, triboard, and wood-nonwood composite are reviewed in detail.

- **Microtechnique and Wood Identification (3)**

Basic techniques of sample preparation, result interpretation, skillful use of microscope, etc. for light and electron microscopies needed in wood anatomy and identification are treated in advance. And, wood identification procedures based on macroscopic, microscopic, and ultramicroscopic features of commercially important domestic and imported woods are discussed in detail. Laboratory work is essential.

- **Advanced Wood Adhesion and Finishing (3)**

In adhesion part, mechanism of wood adhesion, types and characteristics of

wood adhesives, factors of wood adhesion, testing methods and standards of bond performance, newer developments are treated in detail. In finishing part, characteristics and types of wood finishes, finishing and refinishing of wood finishes in solid woods and wood-based materials, effect of construction practices on finish durability, and prevention of failure or discoloration of finishes are treated extensively.

- **Advanced Wood Protection (3)**

The biological mechanism of wood deterioration by insects and microbes will be introduced and students will learn the intensified theories which are required for preservation of wood from biological deterioration.

- **Advanced Treatment Technology in Wood Protection (3)**

The diverse treatment technologies for wood protection from deterioration are introduced and students also learn the knowledge of the recent study.

- **Microbiology in Wood Deterioration (3)**

Students study the biodeterioration of wood caused by microbes and its characteristics, especially by exploring the wood deterioration research on most common wood deterioration microbes.

- **Insects in Wood Deterioration (3)**

Students study the biodeterioration of wood caused by insects and its characteristics, especially by intensified studies on insects and their characteristic damage according to environmental and regional variation.

- **Advanced Wood Deterioration in Wooden Cultural Properties (3)**

This subject manages advanced theories centered specifically on the causes of occurrence and detailed damage properties for wooden structures and landscape components etc. by wood decaying fungi and insects.

- **Advanced Conservation Science and Technology in Wooden Cultural Properties (3)**

This subject covers related theories and technologies in the area of conservation & restoration of wooden and paper cultural heritage. Key focus of conservation science is studying the biodegradation or deterioration mechanism of objects, effective inspection as well as maintenance technologies.

- **Repair and Maintenance Technology in Wooden Cultural Properties (3)**

This subject covers the conservation-restoration treatments for the continuance of wooden cultural heritage to exist in its best condition possible, regardless of

age and degradation.

- **Plant Quarantine (3)**

This subject gives the advanced theories in the area of biological pest control or chemical treatment, that are used to prevent the introduction of organisms such as insect pests which could generate from the increase of regional and national trade quantity.

- **Advanced Bioenergy Science and Technology (3)**

Based on understanding biochemical and biophysical characteristics of cellular materials, students study the processes to produce high-value bio-products.

- **Enzyme Engineering (3)**

The class introduces the expertise and the latest research trends in the theory and application of enzymes which are used in the biological conversion of biomass for the production of high value products.

- **Current Topics in Biomass Pretreatment (3)**

Cellulosic materials are particularly attractive as feedstocks for biofuel or biochemicals production because of their relatively low cost, great abundance, and supply sustainment. However, lignocellulosic biomass, such as the woody plant, contains polymers of cellulose, hemicellulose, and lignin bound together in a complex structure, which is recalcitrant for liberating each component. This subject covers for the pre-treatment technologies for separating each component of the lignocellulosic biomass, emphasizing concepts as well as understanding the mechanism of action and practicability.

- **Current Topics in Wooden Biomass Energy (3)**

This subject deals with the current topics in wooden biomass energy. Especially, researches on converting and processing of wood biomass into biofuels or other value-added products that are recently presented at professional journals are mainly discussed.

- **Biomass Resources (3)**

This subject covers the global forest resources supplying for wood and energy industry. Especially, evaluation of timber and fuel feedstock, supply prospects and their potential from world forest resources are major focuses.

- **Advanced New and Renewable Energy Science (3)**

This subject deals with the new and renewable energy that is needed for implementing the United Nations Framework Convention on Climate Change (UNFCCC) and reducing greenhouse gases. It will focus on all aspects of this particular renewable energy source—its availability, expanded support policy, economics, environmental effects, and practicality.

- **Biomass Fermentation Technology (3)**

Students will learn the fermentation characteristics and the process of carbohydrate obtained through the biomass component separation. The class will emphasize to learn the details of fermentation process including the relationship between the fermentation and pretreatment and saccharification process of biomass.

- **Topics in Natural Products Chemistry (3)**

The study of natural products has always been the starting point of the discipline of chemistry in every country of the globe, and, in view of the importance of these organic compounds in agriculture, medicine, and industry, every student of chemistry today feels the need to acquire further knowledge in this field. Specially, we will deal with wood's structures, properties, natural sources, and synthesis with emphasis on biological activities of important natural products such as terpenoids, alkaloids, flavonoids, steroids, lignans, and other phenolic compounds as well as various essential oils will be introduced.

- **Advanced Nuclear Magnetic Resonance Spectroscopy (3)**

NMR is a spectroscopic method that is even more important to the organic chemist than other spectroscopy. We can acquire many information about the number of magnetically distinct atoms of the type being studied. During the NMR study, we can acquire a structure about unknown compounds. It is very powerful method.

- **Topics in Nuclear Magnetic Resonance Spectroscopy (3)**

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- **Advanced Instrumental Analysis (3)**

Before attempting to deduce the structure of an unknown organic substance from an examination of its spectra, we can simplify the problem somewhat by examining the molecular formula of the substance. The purpose of this lecture is to describe how the molecular formula of a compound is determined and how structural information may be obtained from that formula.

- **Current Topics in Instrumental Analysis (3)**

Before attempting to deduce the structure of an unknown organic substance from an examination of its spectra, we can simplify the problem somewhat by examining the molecular formula of the substance. The purpose of this lecture is to describe how the molecular formula of a compound is determined and how structural information may be obtained from that formula. Many of methods are still in routine use today, but the use of mass spectrometry has become a common alternative. So it will be also covered more weightly

- **Advanced Biochemistry (3)**

Biochemistry is the investigation of the molecular basis of life. Also, Tree biochemistry is too. Structure, dynamics, and the function of biological molecules in cells and organisms will be focused in this class. Metabolisms, formation, and properties of cells, membranes, organelles, and whole living bodies will be also covered.

- **Metabolic Engineering (3)**

In this class, students will acquire knowledge that can be applied to study metabolites through cellular enzymes and their reactions associated with the primary metabolism and secondary metabolism of cells.

- **Advanced Cell Biology (3)**

This class studies the structure and the function of cells and discusses the mutual relation between these two aspects in cells.

- **Wood Materials (3)**

The purpose of this lecture is to understand the fundamental principles of cellulose technology and presents current techniques to modifying the basic chemistry of lignocellulosic materials.

- **Wood Extractives Chemistry (3)**

Among wood species, differences of chemical structures of three major cell wall components, cellulose, hemicellulose, and lignin, are few. However, a great



diversity in extractive composition is found throughout wood species. Although the extractives are low in concentration compared with those of the cell wall polymers, this fraction characterizes each wood species chemically. Most components of wood extractives are classified as secondary metabolites, and the distribution of specific compounds is restricted in certain wood species. This feature provides the basis of chemotaxonomy of woody plants. The purpose of this lecture is to understand how we can use a benefit of wood extractives that has many bio-activity.

- **Advanced Wood Extractives Chemistry (3)**

Among wood species, differences of chemical structures of three major cell wall components, cellulose, hemicellulose, and lignin, are few. However, a great diversity in extractive composition is found throughout wood species. Although the extractives are low in concentration compared with those of the cell wall polymers, this fraction characterizes each wood species chemically. Most components of wood extractives are classified as secondary metabolites, and the distribution of specific compounds is restricted in certain wood species. This feature provides the basis of chemotaxonomy of woody plants. The purpose of this lecture is to understand how we can use a benefit of wood extractives that has many bio-activity.

- **Advanced Papermaking Chemistry (3)**

This course introduces the practical aspects of water, treatment methods of fresh water, white water and effluents. The relevant operations include the physical, chemical and biological operations, the environmental analysis factors, and furthermore the process designs for zero-effluents.

- **Advanced Paper Physics & Converting (3)**

This course gives an understanding and application of the physical and mechanical properties of paper, and various converting processes and end-use requirements involved in the manufacture of commodity and specialty products. The main converting processes are coating, calendaring, super calendaring, printing, and the manufacture of corrugated board.

- **Advanced Paper Machine & Process Control (3)**

This course introduces the principle and structure of pulp and paper machinery. The fundamental subjects are focused on the technical understanding of recent machinery and types of unit operation machine.

- **Advanced Water Treatment in Paper Processes (3)**

Topic includes the introduction to physical, chemical and biological parameters of water and wastewater quality as well as principles of unit operations and processes for water and wastewater treatment. Discussion of zero-effluents design for papermaking process.

- **Advanced Fiber Recovery and Deinking (3)**

The course covers the fiber chemistry and recycling of waste paper. Lecture focuses on the properties of virgin and secondary fibers, re-pulping of waste paper, removal of deinked particles, bleaching of deinked pulps, and deinking process.

- **Advanced Paper Conservation (3)**

The course introduces various aging behaviors and principles of paper by acidification, thermal degradation, moist heat treatment, and structural mechanism of paper for understanding the conservation treatment and systematic approach of aging.

- **Advanced Pulping Science (3)**

Advanced Pulping Science provides the technological and chemical consideration of pulping of raw materials used in the paper industry. Includes advanced consideration of the pulping and bleaching processes, related chemistry, and discussions of related operations, e.g., chemical recovery.

- **Advanced Paper Environmental Analysis & Seminar (3)**

Advanced Paper Environmental Analysis & Seminar introduces the topics of physical, chemical and environmental parameters in paper making process and recycling of waste paper as well as water and waste water treatment. Includes discussions and presentations in advanced topics on paper environmental analysis.

- **Advanced Pulp Fiber Thin-filming Technology (3)**

Advanced course in materials and processes for nano conversion and solutionization using lignocellulosic materials and regenerated cellulose fibers. Study of the thin film fundamentals and operations with nano materials and additives.

- **Microbial Molecular Biology (3)**

This course gives better understanding of the elementary theories of molecular standard relating to life phenomenon, and specifically centering on fungi and bacterium. It investigates the multiplication, evolution, behavior, regulation, and

ecology of microorganisms from molecular level and the research technology of DNA.

- **Regulation of Gene Expression (3)**

The gene expression is the critical beginning process for cells. This class studies the function of local DNA region for gene expression, the regulatory system for gene expression, and the introducing mutations for practical studies.

- **Advanced Protein Engineering (3)**

Protein is the essential molecules for production of many bio-products. This class emphasizes the characteristics of protein and introduces the methods for improving the activity of protein and for producing the protein efficiently.

- **Advanced Microbiology (3)**

This class studies the physiology, the growth, and the application of microorganism with a case study. This case study will provide the bottom-line principles of microbiology in application.

- **New Approaches for Biotechnology (3)**

New cutting-edge technologies are introduced continuously in life science. This class introduces the principles of these new technologies and discusses their application on the study of students.

- **Advanced Biotechnology (3)**

Students will understand the biological characteristics of cells, genes, proteins, and metabolites in this class. They also study the process to produce biological products with added value through their learning and introducing engineering processes.

- **Theory of OMICS (3)**

New biological techniques provide the opportunity to observe the specific characteristic at the cell level. This class will introduce these new technologies with a case study.

- **Current Topics in Wood-based Bionanomaterials (3)**

Current topics and applications of various biomaterials mostly using wood-based nano cellulose are introduced. After that, the applied technology concepts/methods are discussed and analyzed. As a result, the understanding for the bio-nano materials and related new technologies will be promoted.

- **Advanced Wood-based Biomaterials (3)**

This course is designed to provide the use of sustainable wood-based biomaterials and development guides for various new materials.

- **Advanced Green Environmental Materials (3)**

Based on the information for the physical, chemical, and mechanical characteristics of various natural fibers and polymer materials required in developing eco-friendly materials, the thermal, viscoelastic, acoustical, and surface-chemical properties of green composites will be investigated using analytical equipment.

- **Wood-based Environmental Science (3)**

This course treats housing or building environments using various environmentally-friendly construction materials such as wood, wood-based materials, and wood-plastic composites, etc.

- **Advanced Wood Polymer Science (3)**

Wood is a natural composite material and a chemical complex of cellulose, lignin, hemicellulose, and extractives. And polymer is a large (sometimes very large) molecule built up by repetitive bonding together of many smaller molecules. Cellulose, for example, is a polymer built of repeating sugar units: lignin is a polymer formed by the enzymatic dehydrogenation of phenyl-propanes followed by radical coupling. The purpose of this lecture is to understand how a polymer of wood is determined.

- **Wood Polymer Science (3)**

This course considers macromolecular properties of wood.

- **Advanced Wood & Water Relationship (3)**

Specific gravity and moisture content variation affecting the physical properties, and movement of water at the fiber and wood will be discussed. And wood in relation to heat, etc. will be also discussed.

- **Wood Housing Science (3)**

Basic wood properties, wood as an industrial raw material, wood and engineered wood as green building materials, wood-frame house and human health, etc. are discussed in detail.

- **Advanced Paper Material Chemistry (3)**

This course focuses on the chemistry in papermaking processes, and the

principles of colloid and surface chemistry. The topics include the interaction of papermaking materials and chemical additives in the wet-end of a paper machine system, the retention of fine solids and dewatering mechanism, and the practical applications of wet-and dry-end strength additives, sizing agents, water soluble polymer, charge balance, sticky control and other microorganism control agents.

- **Advanced Paper Physics (3)**

This course gives the advanced theory and application in paper structures and properties. The topics are focused on the mechanical behaviour of single fibers, fiber-fiber bonding, paper structure, stress-strain curve of paper, viscoelasticity, paper elastic stiffness behaviour, effects of moisture content and temperature, fiber orientation, formation and optical properties.

- **Advanced Paper Modification (3)**

The course covers the internal and surface sizing, calendaring, coating for the purpose of functional ability of paper and additional special treatment through the paper modification of base paper. Lecture also includes the theoretical background and special applicable field in paper modification.

- **Advanced Paper Mill Modeling (3)**

The course covers the practical understanding of process control in the pulp and paper industry. The objectives of topic are the introduction of chemical engineering controls in papermaking process, process instrumentation, process dynamics, and the fundamental unit operation and mass and energy transfer concepts.

- **Advanced Analysis of Paper Heritage (3)**

Introduction to physical, chemical theories and properties of record & painting materials. Advanced science courses in cellulosic fibers, inorganic additives, deterioration behaviors and analysis methods, deacidification and special treatment for paper conservation.

- **Advanced Hazardous Paper Chemical Analysis (3)**

Introduction to solid and hazardous waste regulations. Analysis and design of solid and hazardous waste management systems, including generation, storage, transport, recycling, biological, physical, chemical and thermal treatment; energy recovery; land disposal; environmental protection systems and monitoring.

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## Dept. of Advanced Materials Engineering

The graduate school of Advanced Materials Engineering Department in Kookmin University was established in November 1974 after the authorization of Ministry of Education. The goal of our graduate course is to educate students who will become pro-active leaders with creative mind in the field of materials related industry by utilizing knowledge of materials engineering. Until now, more than 200 students with master and doctoral degrees have been produced and they play a critical role in the field of industry as well as, academia. 20 faculty members in the graduate school of Advanced Materials Engineering Department are actively doing their research works in the field of metals, ceramics, polymers, semiconductors, displays and energy/environment. Also, the department possesses many up-to-date experimental equipments for various materials-related researches.

Summary Understanding all the topics of materials science and engineering from the synthesis and characterization of metals, electronic materials, ceramics, and polymers to the development of high technology.

### ☐ Courses

#### • **Thermodynamics of Materials (3)**

This course is designed for understanding the thermodynamical behavior of solid solutions. Phase equilibria, statistical physics, chemical reactions, structures of interface and imperfection related with thermodynamic principles are discussed.

#### • **Mechanical Behavior of Materials (3)**

Advanced theories of dislocation, and strengthening mechanism due to dislocations are discussed. Topics include advanced principles and applications of creep, fatigue and fracture behaviors.

#### • **Advanced Semiconductor Physics and Technology (3)**

Behaviors of electrons and holes in semiconductor are discussed and their relevant p-n junction, Schottky junction, MOS capacitors and MOSFET are studied.

#### • **Electronic Materials (3)**

This course is designed to achieve knowledge of principles, properties and applications of electronic materials. Topics include conductor, semiconductors, superconductors, dielectrics and ferroelectrics.

- **Phase Transformation (3)**

Based on diffusion and chemical reaction, principles of phase transformation, solidifications, growth of crystals, precipitation, recrystallization, and Martensite transformation are intensively and extensively discussed.

- **Mass, Heat and Fluid Transport (3)**

Topics include energy equilibrium, lamina and turbulent flow, heat transport, diffusion, convection, and mass transport.

- **Electronic Ceramics (3)**

Principles of various electronic ceramics are introduced and semiconducting, insulating, high dielectric, magnetic, superconducting ceramics are discussed. Applications, such as sensors, actuators, solid oxide fuel cells and MEMS are also discussed. Fracture Mechanics of Engineering Materials Based on fracture mechanics, characterization and design applications of fracture, fatigue, creep of metals are studied.

- **Polymer Science & Engineering (3)**

This course introduces the concept of structure, synthesis, physical/chemical properties of polymer materials which is one of most important characteristics for materials applications in industry. Topics include elastic and plastic theory, strengthening mechanism of polymer materials, tensile behavior, and structure.

- **Statistical Thermodynamics (3)**

Topics include ensembles, classical statistical thermodynamics, ideal gases, lattice statistics, chemical equilibrium, and reaction kinetics.

- **Electron Microscopy (3)**

This course is designed to understand and practice principles and techniques of electron microscope for metallurgical phenomena. Topics include electro optics, diffraction phenomena, analysis of diffraction pattern, kinematical theory, dynamical theory, contrast analysis, images on crystalline imperfections, and CBED analysis.

- **Surface Engineering (3)**

Advanced principles and applications of electrodeposition, chemical deposition, colouring, anodizing, spraying, chemical vapor deposition and physical vapor deposition are discussed.

- **Special Surface Modification Engineering (3)**



Study about the principle, the way of treatment, and the development trend of special surface treatment process to give new properties to material's surface.

- **Dislocations in Crystalline Solids (3)**

Topics include generation mechanisms of defects, effects of crystal structure to dislocations, reaction between dislocation and point defect, and phenomena related to defects and their influence to materials characteristics.

- **Creep and Superplasticity (3)**

In this class, the mechanical properties of high temperature structural materials and their deformation mechanisms are studied. Topics include creep deformation, fatigue and fracture, high temperature failure, and superplastic deformation as well as stress/life prediction of materials.

- **Friction and Wear (3)**

In this course, friction and wear of engineering materials are discussed. Special topics include surface interactions, friction, wear of lubrication, and effects of materials properties as well as development of wear resistant materials and their applications. Relevant techniques of analysis and measurement are also presented.

- **Thin Film Science and processing (3)**

The object of "Thin Film Science and Engineering" class is not only to document what is known about thin films including multilayers, but also to promote the potential of these versatile thin films and to facilitate the adsorption of the technology by others. The field introduced in this class is new. This class will show that thin films including multilayers represent a model platform for promoting modern research and furthermore, the intellectual distance between concept and application is minimal.

- **Process Integration of Integrated Circuits (3)**

This course is to provide the student with an understanding of each process for the fabrication of semiconductor devices and the process integration of Integrated Circuits. In addition, the process for  $1\mu\text{m}$ ,  $0.8\mu\text{m}$ , and  $0.5\mu\text{m}$  CMOS will be introduced, and then discussing its device characteristics. Based on the technology roadmap, the progress for the process development required for the future devices will be predicted and discussed.

- **Plasma Physics and Processing (3)**

The goal of this course is to provide the student with a sound, scientific

understanding of plasma physics and plasma chemistry through which he can better use plasma processes for microelectronic fabrication. The introduction of various plasma processes for sputtering, etching, plasma enhanced chemical deposition of thin films helps him to know the main factors affecting each plasma process. In addition, vacuum technology and surface measurement is to be provided to improve his practical ability to control the processes.

- **Solid State Physics (3)**

Basic principles of modern physics and quantum mechanics, such as wave equation, free electrons, crystal lattice and diffraction phenomenon, are presented on the nanometer scale. Applications to solid state and nano structured materials will be emphasized including band structure, bonding, and electronic response in crystal lattice.

- **Powder Processing (3)**

Topics include fabrication, properties, components of powder and fundamentals of sintering. Industrial application examples of powder metallurgy are also examined.

- **Alloy Design (3)**

The objective of this course is understanding of advanced principles and applications of heat treatment on alloys. Impacts of heat treatment on hardenability and correlations of microstructures and mechanical properties are examined. Design and analysis of alloy are practically discussed.

- **Ferrous Materials (3)**

Fundamentals of alloy components and heat treatment effects on mechanical properties of carbon steels and alloys.

- **Non-Ferrous materials (3)**

This course is designed for understanding of fundamental properties of nonferrous metals, such as Cu, Al, Pb, Ti, and noble metals. The mechanical properties of various alloys are discussed from the viewpoint of materials science.

- **Fracture Mechanics of Engineering materials (3)**

Based on fracture mechanics, characterization and design applications of fracture, fatigue, creep of metals are studied.

- **Plastic Deformation in Metals (3)**

Elastic and plastic behaviors of metals under applied force are discussed in this

course. Principles and techniques of plastic working are also introduced. Effects of mechanical work on metal involving its microstructure change and its behaviors on the properties are also discussed.

- **Advanced Diffusion in Materials (3)**

In this course, based on statistical mechanics, the atomic level theory is studied on the mass transport and energy and momentum balance to the solution of heat, diffusion and fluid flow problems relevant to materials processing and microstructure. How to describe diffusion in materials at the nano-scale will be discussed as well as the effect of various stress and defect states in the materials.

- **Advanced Metallic Materials (3)**

The manufacturing technologies and application of the recent developed metallic materials, such as shape memory alloys, light metallic materials and ultra fine grained materials are introduced.

- **Manufacturing Process of Metallic Materials (3)**

The application of the principles in metallurgy, such as transformation, deformation and the manufacturing technologies are introduced. Especially, the required principles in the application of deformation process such as rolling, wire drawing, forging is discussed.

- **Advanced Process Design of Metallic Materials (3)**

Recent advanced technology in processing and design of metallic materials is presented and studied along with their applications, such as processing of nano materials, multi phase materials, and shape memory alloys.

- **Manufacturing Process for Materials (3)**

Manufacturing processes to make desired shapes and their effects on the properties of materials are introduced and taught on the basis of the plastic deformation and the metallurgical fundamentals.

- **Purification of Materials (3)**

The concept of chemical potential and the relation of phase rule, phase diagram, and mass transfer are discussed. The topics includes the exercise on the solution thermodynamics, and experimental measurement of thermodynamic quantities, and example for purification of materials.

- **Advanced Computational Materials Science (3)**

This course introduces advanced computer modeling methods in materials

science and engineering using discrete particle systems and continuum fields. It covers techniques and software for statistical sampling, simulation, and uses statistical, quantum chemical, molecular dynamics, Monte Carlo, mesoscale and continuum methods to study fundamental physical phenomena encountered in the fields of computational physics, chemistry, mechanics, materials science, biology, and applied mathematics. A term project allows development of individual interests. Students are mentored by members of CMS Lab. in KMU.

- **Surface and Interface Science (3)**

This course surveys the basic concepts of surface and interface free energy, various phase transitions on the surface and interface such as surface roughening, surface reconstruction, etc.. Goals of the course also include the understanding of reaction rate on the surface and interface, physi or chemi sorption, the role of stress in thin film growth, etc..

- **Nanotechnology (3)**

This course will introduce students to the relevant concepts related to the synthesis, science, characterization, and engineering of nanomaterials. Special applications in nanotechnology will also be reviewed, including bio medical, environmental, energy, defense, and telecommunication areas.

- **Electrochemical Engineering (3)**

Electrochemical Engineering is the course to understand the electrochemical principles and how to apply those theories to the relevant industries such as corrosion, surface finishing, battery and fuel cell and hydrometallurgy. This course covers the fundamental concept of electrochemistry, the equilibrium and the kinetics of electrochemical reactions, the corrosion of materials, the surface treatment, and the energy conversion methods such as battery and fuel cell.

- **Electrochemistry (3)**

This course is designed to understand fundamentals of electrode reactions, thermodynamics of solutions, structures of charged interface, and reaction kinetics. The engineering applications of electrochemistry are emphasized.

- **Corrosion Engineering (3)**

This course is designed for an advanced treatment of corrosion and its control in metals and alloys, stressing fundamentals of electrochemistry and their applications to corrosion system, thermodynamics, and kinetics and their relationship to corrosion reactions. Topics include the Butler Volmer equation,

the Wagner Traud analysis, the Pourbaix diagram and Evans diagram, treating electrode reactions, passivity, effects of metallurgical factors on corrosion, anodic and cathodic protection, protective coatings, inhibitors and the proper alloy selections of particular corrosive environments.

- **Mechanics of Materials (3)**

Mechanics of materials deals with the mechanical behaviors of materials when they are loaded. Topics include force and moment, the relationship between stresses and strains, mechanical matters on deformation, compression, torsion, bending, beam deflection, and buckling in a practical manner. This course may provide the fundamentals of elasticity and plasticity as well as the theoretical background of mechanical metallurgy and deformation processing.

- **Advanced Ceramic Materials (3)**

Definition and crystal structures of ceramic materials are fundamental topics and different kinds of bonding and defect structures are advanced subject in this course. In addition it includes effect of crystal structures and defect structures on their physical properties.

- **Materials for Information Technology (3)**

This course will present to students information storage, transmission, and related materials and technology with special emphasis on materials technologies in the areas of optical information processing, memory semiconductors, and large scale information storage.

- **Electronic Display Engineering (3)**

The purpose of this course is to gain an understanding of the principles and techniques of materials and process for flat panel displays (EL, LCD, PDP, FED....) fabrication. Topics also include the characterization and evaluation of display materials and related technologies. Emphasis on materials design in relation to fundamental device characteristics.

- **Nano-material Chemistry & Technology (3)**

In this course, students will learn critical knowledge of chemistry and technology in the areas of advanced metals, polymers, and ceramics. Course modules will cover the fundamental scientific principles of molecular structure, chemical bonding, and structural measurement and analysis of materials at nano scale level as well as related basic theories and mechanisms.

- **Advanced Polymer Materials (3)**

Overview of the problems associated with the selection, design, and function of advanced polymers is presented in this course. Particular emphasis is placed on discussion of the advanced application areas of polymer materials, which may include display, semiconductor, and energy technologies.

- **Materials Recycling Engineering (3)**

Environmental problems are discussed in global scale. Recycling methods for the ferrous and nonferrous scrap and other resources are introduced with their problems. Recent trend in recycling of resources is discussed in related with environmental features.

- **Iron and Steel Processing (3)**

The course is designed for thermodynamic and kinetical treatment of reduction and oxidation reactions, Si Mn reactions, and sulfur reactions for iron and steel making. Topics also include special melt refining.

- **Solidification of Metals (3)**

Topics include properties of melts, solidification of pure metals and alloys, solidification in a mold, gas at the solidification.

- **Imperfection in Solids (3)**

In this course, fundamental structures of solids, such as arrangement of atoms, direction and plane of lattice are depicted. Topics discussed include point defects, line defects, surface and interactions between dislocation and point defect.

- **Thermodynamics of Phase Equilibria (3)**

The lecture includes the equation of Gibbs free energy, lattice stability, sublattice model of solution and compounds, and the exercise will be made for calculation of phase diagram. Some examples for alloy and semiconductor systems are discussed.

- **Diffraction in Material Science (3)**

In this course, basic principles of techniques used in the characterization of engineering materials by X-ray diffraction are discussed. In addition, fundamental crystallographic study on the engineering materials is also conducted and related to X-ray diffraction phenomena.

- **Crystallography (3)**

This course describes system and symmetry of crystalline and explains material properties made a use of tensor. Mathematical expression on material

characteristics including electrical and magnetic as well as mechanical properties.

- **Composite Materials (3)**

In composite materials system of metals, ceramics, carbon fibers and glass fibers, bonding structure, mixing principles, interfacial structure, mechanical properties and causes of fracture are discussed. Design and fabrication of composite materials are studied.

- **Welding Metallurgy (3)**

This course is design to understand effects of heat transfer, phase transformation, grain growth, formation of defects and residual stress due to welding of metals. Topics include evaluation and development of welding process.

- **Electronic Materials Fabrication Processing (3)**

The goal of this course is to provide the student with a fundamental understanding of each process for the fabrication of microelectronic and electronic devices. The processes of oxidation, diffusion, ion implantation, etching, photolithography, metallization and packaging will be discussed with an emphasis on the principle of each process and its equipment, and the process related issues.

- **Reaction Kinetics (3)**

Topics include measurement techniques of concentration and reaction rate in chemical reactions, single step and multi step reactions, order of reaction, solid catalyst reactions, gas solid noncatalyst reactions, solid liquid reactions.

- **Mechanical Properties of Thin Films (3)**

This course covers the mechanical properties of the thin films deposited on various substrates with an emphasis on thin film dynamics, process related stresses, and the measurement of thin film stresses. In addition, effects of the microstructure of thin film depending on the process variables such as substrate temperature and pressure, on its plastic deformation and elastic behavior will be discussed.

- **Heat Treatment Engineering (3)**

The effects of heat treatment on properties and microstructures of metallic materials and the recent trend of new technologies are introduced. Based on the principles of phase transformation and strengthening in metallurgy, the

relationship between mechanical properties and microstructures, newly introduced manufacturing process, and the application of heat treating technology to machine parts and structures are discussed.

- **Materials in Energy and Environmental Application (3)**

Energy Storage and Conversion Materials is the course to understand the electrochemical principles related with energy storage and conversion materials and how to apply those principles to the relevant industries such as primary and secondary batteries, fuel cell and hydrogen storage materials. This course covers the fundamental concepts of thermodynamics and the equilibrium and the kinetics of electrochemical reactions associated with energy conversion materials and methods.

- **Special Topics in Structural Materials (3)**

This course covers the special topics and recent case studies in the field of advanced structural materials. Design issues pertaining to materials selection for load bearing applications are also discussed. Specific topics include engineering materials, structure property relationships, materials selection for design, and mechanical behavior of advanced materials through recently published critical papers.

- **Special Topics in Electronic Materials (3)**

This course is an introduction to the physical principles underlying the electric properties of modern solids with emphasis on semiconductors.

- **Special Topics in Electro-Chemistry (3)**

This course deals with the recent theory on electrochemistry and corrosion. Mechanisms and rates in relation to physiochemical and metallurgical factors are also discussed.

- **Special Topics in Computer Application in Materials (3)**

This course is an introduction to computational materials science. Development of atomic and molecular level simulations for materials science applications will be discussed. Additionally, simple numerical methods are presented for solving differential equations and for studying correlations.

- **Special Topics in Nano-Materials (3)**

In this course, the essential properties of nanomaterials and their relevant concepts governing the synthesis, science, and engineering of nanomaterials are discussed. In addition, new properties at the nanoscale and existing and



emerging applications of nanomaterials are presented.

- **Advanced Physical Metallurgy (3)**

Advanced theories, novel techniques, and recent industrial applications related with physical metallurgy.

- **Advanced Chemical Metallurgy (3)**

Advanced theories, novel techniques, and recent industrial applications related with chemical metallurgy.

- **Advanced Theory in Property of Materials (3)**

In this course, a survey of Materials Science and the physical properties of materials at the beginning graduate level is presented. Focus should be on the nature of microstructure and its manipulation and control to determine engineering properties: reviews include bonding, structure and microstructure, the chemical, electromagnetic and mechanical properties of materials.

- **Advanced Process in Manufacturing Materials (3)**

The principles of materials processing with emphasis on the use of processing to establish microstructures with impart desirable engineering properties. Some of the topics in this course should include solidification, thermal and mechanical processing, powder processing, and surface treatments.

- **Seminar in Process Design Engineering (3)**

Principal of process design in advanced materials engineering, recent trend of special technology and problems in advanced materials processing are discussed.

- **Seminar in Materials Engineering (3)**

Principles of materials engineering, recent trend of special technology and problems in advanced materials engineering are discussed.

- **Smart Fashion Convergence Research(3)**

Fashion items with functionalities based on module system are investigated in convergence of design, technology and marketing. Constructing platform for wearable electronics is critical issue and various disciplines should cooperate to build it. This course aims the convergence research to figure out the solutions for smart fashion and killer application.

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## Dept. of Mechanical Engineering

We offer graduate programs leading to the degrees of Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) in mechanical engineering. The primary mission of the department is to promote sustainable energy research and education, for the ultimate goal of serving the environment and the global community. Our department is one of the nation's top-ranked engineering departments focusing on energy and environment. Graduate students work closely with faculty members to improve research skills and to build engineering careers. Students can join international research activities through various government- and corporate-funded projects that we offer, which will provide scholarship opportunities. Our research interests are not limited to basic topics in thermal energy and environmental engineering such as refrigeration, air-conditioning, fluid machinery and renewable energy systems, but the funded projects encompass various engineering topics in connection with micro-electro-mechanical systems, information and communication technologies, and bio-systems.

Prospective students are encouraged to contact faculty members in the department to learn about their interests and research areas. Applications and all inquiries regarding the admission should be made to the Office of Admission, which will be able to provide information about requirements, application materials, schedules, finances and other topics.

### ☐ Courses

- **Advanced Applied Mathematics (3)**

The analytic methods to solve ordinary differential equations and partial differential equations with boundary and initial conditions are studied to apply engineering problems encountered in practice.

- **Advanced Numerical Analysis (3)**

Selected topics on numerical methods for engineering applications including interpolation, systems of linear algebraic equations, optimization, numerical differential and integration, ordinary differential equations, and partial differential equations.

- **Advanced Thermodynamics (3)**

Development and application of basic concepts in thermodynamics, entropy and information theory, basic concepts on statistical and irreversible thermodynamics.

- **Advanced Fluid Mechanics (3)**

Fundamental concepts and methods of fluid mechanics, inviscid flow and

Bernoulli theorems, potential flow and its application, Navier-Stokes equations and constitutive theory, exact solutions of Navier-Stokes equations, boundary layer theory, introduction to turbulence.

- **Advanced Heat Transfer (3)**

Basic theories on heat conduction, mathematical solution and simplified method for numerical solution to the 1,2D steady and 1D unsteady heat conduction problems: basic theories on heat convection and related continuity, momentum and energy equations, laminar flow heat convection: radiative heat transfer basics and shape factors.

- **Advanced Topics in Control Engineering (3)**

Study modern control theories for the multi-inputs multi-outputs control system. Include the nonlinear control system theories. Focus on control theories and design method for real systems.

- **Experimental Methods for Engineers (3)**

Experimental planning, variable analysis and identification, data acquisition and recording, statistical data analysis, including regression correlation, and dispersion analysis.

- **Computational Thermodynamics (3)**

Numerical methods applied to the thermodynamic systems: modeling, analysis, simulation and optimal design: development of computer programs.

- **Advanced Thermophysical Properties (3)**

Thermodynamic and physical properties of substances used as a working fluid of various thermo fluid system such as PVT relation, vapor pressures, latent heat, specific heat and Gibbs energy of formation: mathematical expressions and accurate correlations for the prediction of thermo-physical properties.

- **Computational Fluid Dynamics (3)**

This course is primarily aimed at developing a general method of prediction for heat and mass transfer, fluid flow, and related process. It includes mathematical description of physical phenomena, discretization methods, heat conduction, convection and diffusion, calculation of flow field, et al.

- **Turbulent Flow (3)**

Fundamentals of turbulent flows, the basic equations, the origin of turbulence, turbulent production and dissipation, vorticity dynamics, turbulence scale, correlation functions and spectral dynamics, turbulence modeling.

- **Advanced Turbomachinery (3)**

Fundamentals of energy conversion in fluid machines: principle, application and design procedure for fluid machines such as pumps and turbines: review of past developments, the current status, and future research needs in turbo-machinery fluid dynamics.

- **Computational Heat Transfer (3)**

Numerical schemes and numerical simulation methods are studied to solve mathematical equations, which are derived from the heat transfer phenomena, such as conduction, convection, radiation, evaporation and condensation. Computational practice is carried out in parallel to approach to applied heat transfer problems.

- **Advanced Refrigeration (3)**

Refrigeration cycles, the characteristics of each components, system performance analysis, refrigerants, control methodologies.

- **Thermal Environmental Engineering (3)**

Theoretical and practical topics related to indoor thermal environments such as, IAQ, psychrometrics, heating/cooling loads, air pollutants, thermal comfort, ventilation effectiveness, and airflow simulation.

- **Heat Engine (3)**

Theoretical analysis of heat engines and related combustion processes, design of heat engine components such as boilers and steam turbines, and application in practical problems.

- **Combustion Devices (3)**

Basic theories of thermodynamics, fluid mechanics, chemical equilibrium, and chemical reaction, and their application in systematic analysis and design of combustion devices

- **Advanced Gas Turbine (3)**

Advanced theories on thermal flow, reaction, structural and dynamic characteristics are studied.

- **Advanced Energy Engineering (3)**

Management for the conservative use of energy reserve and processes of alternative energy resources such as solar, tidal, and wind energy: The social and economic consideration of energy consumption based on the engineering

methodology regarding the potential energy problems.

- **Digital Control (3)**

Analyse technical issues associated with computer applications. Study control theories and design methods for digital applications. Include the Z-transform, the analysis of sampled data systems, and the digital filter design.

- **Case Studies in Mechanical Engineering (3)**

Case studies of thermo fluid systems required to identify their characteristics and also to develop the modeling and analysis methods.

- **Special Topics in Mechanical Engineering (3)**

Various technologies, modeling and analysis of specific thermo fluid systems.

- **High Temperature Thermal Engineering (3)**

Thermal behavior of materials at high temperature above 1000°C is studied. Theories on phenomena at high temperature, such as melting and solidification of mineral materials, radiative and convective heat transfer, pure oxygen combustion etc, are investigated.

- **Biomimetic Engineering (3)**

This course is intended to provide the engineering principles found in nature, which is considered a highly efficient and optimized system. It discusses newly designed man-made systems by mimicking and engineering biological phenomena regulated precisely in a tiny physical space.

- **Biomedical Instrumentation (3)**

This course covers the principles of biomedical devices and related multidisciplinary technologies. Topics include liquid-handling and optical detection systems which are essential parts of various emerging tools for biomedical research and development.

- **Special Topics on Environmental Machines (3)**

Environmental machines applied for waste treatment, waste water treatment, air pollution control are studied. Thermal or cold fluid flow, heat and mass transfer, and reactions for waste incineration system, waste water treatment, various pollution control system is investigated and improve the design ability for actual system by design exercise.

- **Renewable Energy Sources (3)**

This lecture delivers about renewable energy source, its application and

management for efficient utilization such as solar, tide and wind etc. Based on the engineering theory and knowledge related with energy and global warming crisis, the efficient method in the aspect of social and economic utilization of renewable energy is treated.

- **Simulation Software (3)**

Study various commercial simulation softwares for energy systems design and analysis.

- **Building Automation System (3)**

Graduate students will learn principles of automatic control, control systems and applications to building energy systems. They will also acquire knowledge regarding renewable energy sources, energy system, building automation and plant engineering.

- **Industry-University Cooperative Seminar 1 (1)**

This course will provide entry level industry-university joint seminar for graduate students to follow up current research not only conducted from our graduate schools, but also performed from the industries or institutes joined with our programs. Through this seminar, it is expected that students can obtain research senses based on understanding the current technical and research trends and issues.

- **Industry-University Cooperative Seminar 2 (1)**

This course will provide advanced level industry-university joint seminar for graduate students to follow up current research not only conducted from our graduate schools, but also performed from the industries or institutes. Through this seminar, it is expected that students can obtain further research senses based on understanding the current technical and research trends and issues.

- **Industry-University Cooperative Special Lecture (2)**

This course will provide industry-university joint seminar for graduate students to follow up current research not only conducted from our graduate schools, but also performed from the industries or institutes joined with our programs. Through this seminar, it is expected that students can obtain practical research capabilities and skills based on understanding the current technical trends.

- **Research Ethics & Thesis Study (3)**

Graduate students will develop an understanding of the nature of ethical



decision-making and its role in research ethics. They will also acquire an appreciation of the reasons for conducting ethical review of research and an awareness of some of the international codes of research ethics that have been developed in response to scandals and abuses in research. Finally, they will understand the nature and definition of research ethics and an appreciation of the importance of good research.

- **Advanced HVAC System (3)**

Main topics include air conditioning system, zoning, heat pump system and its application, load calculation, system design, and relevant HVAC equipments for a comfort living environment.

- **Measurements in Thermofluidic HVAC Systems (3)**

Study methods of error estimation and analysis, and its propagation occurred during a measurement. Topics also include principles of temperature and flow velocity measurements such as state-of-the-art experimental techniques using thermocouple, RTD, liquid crystal, and laser Doppler velocimetry, hot wire anemometer.

- **Design of Energy Systems (3)**

Modeling and simulation of thermal systems, such as heat exchangers, refrigeration systems, manufacturing processes, power plants etc. Optimization and economic analysis of thermal systems

- **Energy System Control (3)**

Study the dynamic behaviors of the energy system focused on the control system design of the energy system including the HVAC system.

- **Plant EPC (3)**

Engineering, Procurement and Construction on power plant, incineration plant, renewable energy plant, and environmental plant. Maintenance and economic feasibility analysis are also studied.

- **Advanced Micro Thermofluids (3)**

Control technologies of micro-physical phenomena, heat transfer and fluid flow of thermal fluid systems for their applications in next-generation technologies of BT, NT, or IT are discussed.

- **Intelligent Control (3)**

Study intelligent control technologies for the real time application. Focus on topics related to the expert system, the fuzzy system, the neural network

system and the genetic system. Include practical application examples of their algorithms.

- **Selected Topics of Measurements in Heat Transfer and Fluid Flow (3)**

Selected topics on thermo-fluid measurement techniques, using RTD, liquid crystal, hot-wire, LDV, PIV, and other advanced measurement techniques for heat transfer and fluid flow research.

- **Studies on the Thermodynamic Systems (3)**

Modeling and analysis of thermodynamic systems: principles and applications of new thermodynamic cycles and various up-to-date thermofluid systems.

- **Statistical Thermodynamics (3)**

Analysis of behavior of materials in a microscopic point of view, basic probabilities and quantum mechanics, approach of general theories in the classical thermodynamics using statistical method, statistical analysis of chemical equilibrium, ideal gas behavior and real gas behavior, non-equilibrium process and irreversible processes.

- **Fluid Phase Equilibria (3)**

Theories in chemical equilibrium, phase equilibrium and properties of pure substance and mixture refrigerants, application to the refrigeration cycle analysis.

- **Viscous Fluid Flow (3)**

Advanced topics and methods on analysis of viscous fluid flow.

- **Non-Newtonian Fluid Mechanics (3)**

Fundamentals of viscoelastic fluid: types and behavior of non-Newtonian fluid: governing equations for non-Newtonian fluid flow: Surface Phenomena: dielectric-behavior, pipe flow of non-Newtonian fluid.

- **Advanced Boundary Layer Theory (3)**

Origin of turbulence: fundamentals of turbulent flow: turbulent boundary layers in incompressible and compressible flows: free turbulent flows

- **Advanced Transport Phenomena (3)**

Introduction to the field of transport phenomena emphasizing on understanding basic physical principles: momentum transport (viscous flow): energy transport (heat conduction, convection and radiation): mass transport (diffusion).

- **Compressible Flow (3)**

Fundamentals of compressible flow, governing equations for compressible fluid flow, steady 1D isentropic flow, steady 1D flow with friction and heat transfer, shock and expansion waves, flow with small perturbation, method of characteristics.

- **Applied Computational Fluid Dynamic**

Basic concepts of fluid flow, introduction to numerical methods, finite volume methods, solution of linear equation systems, methods for unsteady problems, solution of Navier-Stokes equations, complex geometries, turbulent flows, compressible flow.

- **Convection and Radiation Heat Transfer (3)**

Natural and turbulent convective heat transfer, The effect of fluid properties on convective heat transfer, high speed turbulent heat transfer, Radiative heat transfer phenomena in an absorptive and transparent media, Analysis of complex heat transfer.

- **Cooling of Electronics (3)**

The state of art on cooling technologies of electronic equipments are studied to pursue the compact systems. Innovative design method on cooling system of electronics is also carried out to solve practical problems.

- **Advanced Mass Transfer (3)**

Transport phenomena due to the concentration difference, property characteristics such as viscosities and diffusion coefficients: turbulent transport: molecular dynamics: heat and mass coupled transport phenomena, special problems.

- **Applied Air Conditioning (3)**

Calculation of air conditioning loads, system design, behavior of components, special problems related to air conditioning.

- **Applied Refrigeration (3)**

Analysis of various refrigeration cycles, design of the whole system and components, special problems related to refrigeration.

- **Ventilation and Air Cleaning (3)**

Theories and practices of ventilation and air cleaning, modeling and measurements of airflow and pollution concentrations, system design of

ventilation and air cleaning devices to provide comfortable indoor space.

- **Cryogenic Engineering (3)**

Design and fabrication of cryogenic coolers to obtain the temperature range below  $-150^{\circ}\text{C}$  is studied. Various applications of cryogenic technology to medical, transportations, telecommunications, and industrial process are also dealt with in this course.

- **Thermal Transport in Materials Processing (3)**

Thermal transport encountered in the materials processing, such as casting, continuous casting, extrusion, molding, and heat treatment process, is studied. Design of thermal processing is carried out for the effective operation.

- **Advanced Heat Power (3)**

Advanced topics in performance characterization, analysis, design, and control of heat power systems and their components.

- **Advanced Combustion (3)**

Advanced topics in combustion engineering including analysis, design, and optimization of various combustion processes based on gaseous, liquid, and solid fuels.

- **Advanced Design of Thermal Equipments (3)**

Modeling of thermal equipments including heat exchangers, turbo machinery, piping and duct systems, simulations and design optimization of thermal systems, economic considerations.

- **Optimal Control (3)**

Study optimal control theories based on linear control theories. Emphasize practical applications of control theories to real systems. Include topics for the dynamic programming, the Pontryagin minimum principle, and optimal control design methods.

- **Application of Advanced Control Engineering (3)**

Study adaptive control theories. Emphasize practical applications of control theories to real systems. Include topics for self-tuning regulators and model reference adaptive controllers.

- **Process Control (3)**

Study the process control of mechanical systems. Emphasize closed-loop system dynamics and design methods for multi-variable processes. Include topics for

the control valve sizing and the control system structure design.

- **Special Studies on Mechanical Engineering (3)**

Methods of modeling and analysis of specific thermofluid systems.

- **Seminar in Mechanical Engineering (3)**

Studies of thermofluid systems to survey the current trend of research and development on them.

- **Multi-phase Flow (3)**

This course covers the current status in estimating the important engineering parameters and physical phenomena in multi-phase flow to cases where more than two phases are present. Adiabatic two-phase flow is not only concerned in this course, but convective boiling and condensation, which is great importance of heat and mass transfer between phases, is also lectured. This course focuses on two-phase flow notation and flow patterns, the basic governing equations of two-phase flow, empirical treatment of two-phase flow, pool and convective boiling, subcooled and saturated boiling heat transfer, critical heat flux, condensation, etc.

- **International Cooperation Seminar (3)**

This course is intended to introduce the importance of international cooperation in education and research activities especially in the field of energy engineering. Students will acquire the understanding on ODA (official development assistance) and the basic ability to participate in international activities. This course is composed of various types of joint seminar, such as online remote lectures from foreign countries and off-line seminar by invited speakers.

- **Smart Convergence Technology (3)**

This subject introduces information technology (IT) for energy engineering including the heating and cooling systems to maximize the efficiency with minimum cost. The subject also introduces new technologies such as biotechnology (BT) and nanotechnology (NT), which are applied to core elements of energy systems.

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## Department of Mechanics and Design

Graduate programs leading to the degrees of M.S. and Ph.D. in Mechanics and Design were established in 1987 and 1991, respectively. The joint M.S. - Ph.D. degree program is also being offered. The broad fields that are covered involve fundamental mechanics of solids, materials design for machine elements, reliability and optimization, fracture and fatigue, computer - aided design, and manufacturing. Moreover, in order to keep up with the latest trends and developments, strong emphasis is placed on the research and education in the emerging fields such as micro/nano/bio system and information technology.

### □ Major Courses

#### • **Advanced Stress Analysis (3)**

Studies of stresses and strains in three-dimensional problems: failure theories and yield criteria: stress function approach to two-dimensional problems: bending of non-homogeneous asymmetric curved beams: torsion of bars with non-circular cross sections: energy methods: elastic stability, and introduction to plate theory.

#### • **Continuum Mechanics (3)**

This course is intended to provide the entering graduate students with the basic concepts of vector and tensors and the analysis of stresses and deformation at a point in a continuous medium, followed by the derivations and applications of fundamental equations of a continuous medium based on the laws of conservation of mass, linear momentum, moment of momentum, and those of thermodynamics: constitutive relations for fluids and solids. Specialization of the field equations to some boundary value problems in solid and fluid mechanics are also addressed.

#### • **Advanced Numerical Analysis (3)**

This course is designed to acquaint entering graduate students with the fundamental theory of numerical analysis that is essential in solving variety of engineering problems of practical interest. In addition to a series of lectures on the solution of systems of linear equations based on direct methods, error analysis, structured matrices, and iterative methods, the students are further introduced to the numerical solution of ordinary and partial differential equations subjected to certain boundary and initial conditions. Stability and convergence of the numerical solutions are also addressed.

- **Advanced Finite Element Method (3)**

This course deals with the finite element formulations such as direct stiffness method, potential energy method, Galerkin's weighted residual method, and virtual work approach. It also introduces an isoparametric formulation with proper numerical integration rules. This course will offer the students experience in solving the boundary value problems related to solid mechanics with the educational version of finite element package. Especially, emphasis is placed on the modeling of physical problem and the interpretation of its FE solutions

- **Advanced Composite Materials (3)**

Fundamental concepts for composite mechanics, materials, and processing: Topics may include stress strain relationships for lamina, stress analysis for laminates, strength and failure theory, fracture, cracking, or damages, environmental effects, toughening mechanisms, and applications (e.g. automobile, spacecraft and airplanes, bio-medical devices and bio-materials) for metal, ceramic, and polymer based multifunctional composites.

- **Concurrent Engineering (3)**

This course deals with the concept and the state-of-the-art of concurrent engineering. A systematic survey of the application and effects of the concurrent engineering design tools (DFA, DFM, DFS, DFE) through simulation and case study is studied.

- **Bio-Engineering (3)**

This course gives an introduction to the biomechanics and their applications in bio-mechanical engineering. It deals with design concept of biomechanical system based on material science, fluid mechanics, and solid mechanics. Main topics are biofluid mechanics such as lubrication of human synovial joints, cardiac bodynamics and mechanics of heart valves as well as biosolid mechanics such as mechanics of hard tissue, mechanics of joint articulating surface motion and contact mechanics.

- **Advanced Theory of Elasticity (3)**

Topics covered include stress and equilibrium: deformations, strain and compatibility: constitutive equations: two-dimensional problems in Cartesian and polar coordinates: application to extension, bending and torsion: introduction to three-dimensional problems using displacement potentials.

- **Computational Mechanics (3)**



Basic principles of continuum mechanics and finite element methods, with modern applications to the solution of practical problems in solid, structural, and fluid mechanics, heat and mass transfer, and other field problems, are introduced. Besides, kinematics of deformation, strain and stress measures, constitutive relations, conservation laws, virtual work, and variational principles are taught. The discretization of governing equations using finite element methods and the solution of central problems using a general purpose finite element analysis program are also covered.

- **Advanced Machine Design (3)**

The advanced topics in the field of machine design are studied: fracture theory for ductile and brittle material: design and application of beams: analysis for special springs: tribology: analysis for brake system: design and analysis for gear trains: introduction to robust engineering: and machine balancing design. The participants should research on an application as the final term project and present their results in the end of semester.

- **Topics in Mechanical Design (3)**

This course deals with problems and solutions on deformations and failures of various mechanical and automotive components. The approach emphasizes selection of materials to help with designing mechanical structures. Degradation of materials, fatigue failure by poor design, stress concentration in mechanical design and their solutions are described in this course.

- **Optimal Design (3)**

The optimization theory and practice as it applies to engineering design is studied. Topics include monotonicity analysis, numerical methods in continuous design spaces and techniques for discrete optimization, through the analytical and computer-based assignments and design exercises.

- **Intelligent CAD (3)**

Both the existing and new CAD theories are covered, together with the fundamentals and implementations of the intelligent CAD system so that the latest information technologies such as artificial intelligence, virtual reality applications, and the collaborative design theories are addressed.

- **Fatigue (3)**

Cyclic loading versus material damage concepts based on linear elastic and elastic-plastic fracture mechanics: Topics may include the mechanism and occurrences of fatigue in service, predicting material damages and remaining

fatigue life, stress or strain based approach. Case studies are fatigue in small scale structures, and damage tolerance design against fatigue cracking.

- **Advanced Fracture Mechanics (3)**

Linear elastic and elasto-plastic models of local stress fields around the crack tips are discussed, with the introduction of concepts of stress intensity factors, strain energy release rate, strain energy density, J-integrals, and fracture resistance. Mathematical models for crack extension and fatigue crack growth are further addressed, from the standpoint of importance of maintaining the integrity of various elements and components of engineering structures.

- **Plasticity and Forming Process (3)**

This course introduces the stress and strain tensor appropriate for the analysis of large plastic deformation. This course focuses on the physical meaning of yielding, which consists of yield conditions, flow rule, and post yielding behaviour of hardening, together with its mathematical representation or constitutive equations for plastic deformation. The student will complete the term project ? design of actual forming processes such as rolling, forging or sheet forming.

- **Topics in Manufacturing Technology (3)**

Advanced study on the aspects of manufacturing and production technologies in a competitive environment is performed. Topics include the manufacturing processes, facilities, and systems and operation technology. Seminars involving case studies should be presented by the students.

- **Advanced Engineering Mathematics (3)**

This course covers the methodologies for solving mathematical problems which are encountered in mechanical design processes. The various practical solutions are suggested for engineering applications, i.e., boundary value problems: partial differential equations: complex integration: calculus of variations in the fields of fracture mechanics: elasticity: finite element method: and manufacturing.

- **Advanced Dynamics (3)**

This course covers rigid body kinematics/kinetics, Lagrange equation, Euler equation, Hamilton Jacobi equation, gyroscopic motion, stability analysis of autonomous and non-autonomous system, and nonlinear system analysis.

- **Nano-engineering (3)**

This course describes a guide to nanotechnologies basing on nanometer scale and nano-applications in modern engineering, together with bottom-up and top-down nanofabrication technology being addressed. History and future of nanotechnology, nanoparticles, nanocoatings, micro and nano mechanics, lithography technology for semiconductor device and nanocharacterization are main topics.

- **Advanced Micro-Electro-Mechanical System (3)**

Nano/micro fabrication and equipments for sensor, actuator, energy harvesting device, optical/display device and functional surface applications are introduced. Topics include not only basic semiconductor fabrication process such as optical lithography, deposition, and etching, but also state of art fabrication process such as ink jet, imprint, roll-to-roll, etc.

- **Robotic Mechanism Design (3)**

The lecture 'Robot Mechanism Design' covers two main topics: (1) mathematical theories to derive equations of motion of the robot mechanisms; (2) the modeling methodologies in designing the robot mechanism. The mathematical theories include the POE method, Jacobian and dynamic analysis, which is essential to derive Newtonian and Lagrangian mechanics of the robots. In addition, basic control theories, kinematic modeling of mechanism, and practice of a conventional multibody dynamics program are introduced. The term project about the robot mechanism design will be assigned for the students as a final evaluation.

- **Computational Plasticity (3)**

This course deals with the advanced level of mathematical and numerical formulation for nonlinear problems raised in various forming processes. Focuses are given to micro forming of amorphous alloys as well as the conventional forming of polycrystalline materials with damage. Students are enforced to implement the numerical formulation of the constitutive description for such nonlinear material behaviour into the given educational version of FE package.

- **Advanced Production Technology (3)**

The concept and the state of the art of advanced production technology is addressed with emphasis on H/W (CNC machine tools, industrial robot, automated guided vehicle, automatic storage and retrieval system, FMS, CIM) and S/W tools (CAD, CAM, CAPP).

- **Environmentally Conscious Design (3)**

The course is designed to learn about environmentally conscious design and manufacture, the growing national and international efforts in reducing the environmental impact of products, and how the environmental considerations affect the design's technical, economical and quality requirements.

- **CNC Machine Tool (3)**

CNC machine tools with computer are composed of part program, control systems, and machine tool itself. Therefore this subject includes the method to make part programs, the functions of control systems, and the classification of machine tools. Another topic is to understand FMS and CIM by applying the CNC machine tools to the automation which increase the productivity.

- **Intelligent Building System (3)**

The IBS is an advanced information building with a high level of information, communication, and automatic control system. We will study the concept and theory about element technologies to implement this system such as architecture, communication, office automation, and building automation. Finally this course introduces applications for the system integration.

- **Nano Convergence Mechanical Technology (3)**

Related to energy issues such as production, efficiency enhancement, and savement, nano convergence mechanical technology is introduced, which covers design, fabrication, and applications.

- **Dynamic System Design (3)**

This course deals with a design process about dynamic systems which have kinematic chains. The kinematic and dynamic analysis of the mechanism systems are studied on and the function modeling of the mechanism systems is considered with concept of the model-based design. The modeling methodologies about the classical control and digital control are also researched on with the Simulink S/W in this course.

- **Micro-Processor (3)**

In this lecture, students understand a microprocessor and its principle. Using microprocessors, students learn ability to operate and control robotics systems.

- **Linear System (3)**

A linear system is a mathematic model of system based on linear algebra. It is useful for system control and analysis. Through linear system, students learn fundamental knowledge for system analysis.

- **Applied Theory of Elasticity (3)**

Topics include generalized Hooke's law, strain-energy density, uniqueness: classes of boundary value problems (Navier's and Beltrami-Mitchell equations): torsion (Dirichlet and Neumann problems): flexure: complex variable formulation of torsion and two-dimensional problems: general solution methodologies based on complex variable techniques and elements of potential theory for torsion and two-dimensional problems: three-dimensional problems: wave propagation: and energy methods.

- **Applied Numerical Analysis (3)**

The fundamentals of modern numerical techniques for a wide range of linear and nonlinear elliptic, parabolic, and hyperbolic partial differential and integral equations are covered. Topics include finite difference, finite volume, finite element, and boundary element discretization methods: and direct and iterative solution techniques. The methodologies described form the foundation for computational approaches to engineering systems involving heat transfer, solid mechanics, fluid dynamics, and electromagnetics. Strong emphasis is given to the computer implementation of algorithms in programming assignments.

- **Applied Computational Mechanics (3)**

The computational techniques for the simulation of a large variety of engineering and engineered systems are addressed. Applications are drawn from aerospace, mechanical, electrical, and chemical engineering, biology, and materials science. Topics include mathematical formulations: network problems: sparse direct and iterative matrix solution techniques: Newton methods for nonlinear problems: discretization methods for ordinary, time-periodic and partial differential equations: fast methods for partial differential equations and integral equations.

- **Applied Finite Element Method (3)**

This course deals with the finite element formulations for the nonlinear, thermo-mechanical problems. Formulations include both explicit and implicit method to satisfy equilibrium of a body. Newton type approaches for nonlinear problem together complicated integration rules are also introduced. This course will offer the students experience in solving the boundary value problems related to nonlinear thermo-mechanical stress analysis.

- **Applied Stress Analysis (3)**

Various up-to-date stress analysis techniques, including advanced strength of

materials, energy methods, theory of elasticity, creep, yield and failure criteria, inelastic behavior, fracture mechanics, and fatigue crack growth analysis are studied.

- **Applied Machine Design (3)**

This course covers the theory of the practical machine design applications such as: design for strength and rigidity under both static and dynamic loads: design for the strength under Fatigue: shaft design with joints: lubrication and bearing design: finite element analysis: optimization and statistical consideration in design process. The participants should research on the application as the final term project and present their results at the end of semester.

- **Topics in Applied Mechanical Design (3)**

This course deals with subjects on the progress of advanced engineering techniques in the various fields of design, mechanics, materials, fracture, etc.

- **Applied Optimal Design (3)**

A comprehensive study of classical and modern design optimization methods is made. Students are involved in computer-based, quarter-long, group-oriented projects, the concepts of which are drawn from their student projects, other courses, and/or industry.

- **Advanced System Design (3)**

This course deals the recent system design related to manufacturing. Through the study on recent papers, high level research ability can be raised.

- **Applied CAD (3)**

This course introduces the latest technologies related the design process methods and evolutionary methods in actual designing. Reviews are made over the recent researches related to the design and manufacturing systems, by surveying the recent papers. Students will be evaluated by the oral presentation regarding the related fields.

- **Micromechanics (3)**

Analytical, experimental, and computational analysis methods to apply the mechanics of materials knowledge with various scales ranging from micro scale to continuum. Emphasis will be on mechanical property evaluation and fracture behavior in coating, thin film, composites, interfaces, nanotubes, nanolaminates, and biomaterials.

- **Design of Composite Structures (3)**

Analytical, experimental, and computational mechanics and design of composite materials and structures: laminate stress, failure and cracking analysis for composites material and sandwich structures, design studies, finite element methods to composite structures, and design of composite and biological structures.

- **Stress Analysis of Composite Materials (3)**

Topics covered in this course include three-dimensional anisotropic constitutive equations, edge effects and interlaminar stresses, hygrothermal stress analysis of composite tube assemblages, cylindrical bending of laminated composite structures. Various failure criteria and fracture of composites are also introduced. Further addressed are the micromechanics and bounds on effective properties, heat conduction and moisture diffusion, and higher order laminated plate theories.

- **Advanced Manufacturing Processes (3)**

Systematic review of the conventional and non-conventional manufacturing processes is made. Emphasis is placed on the principles, characteristics and associated economic and environmental aspects of processes, from both the theoretical and applied viewpoint.

- **Topics in Applied Manufacturing Technology (3)**

Advanced subjects related to the manufacturing technology in the new industries based on high technology (NT, BT) are covered. Topics include the processes, facilities, systems and operation technology, with seminars concerning case studies being presented by the participating students.

- **Research Ethics & Thesis Study (3)**

Graduate students will develop an understanding of the nature of ethical decision-making and its role in research ethics. They will also acquire an appreciation of the reasons for conducting ethical review of research and an awareness of some of the international codes of research ethics that have been developed in response to scandals and abuses in research. Finally, they will understand the nature and definition of research ethics and an appreciation of the importance of good research.

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## **Dept. of Civil and Environmental Engineering**

More than any other field of engineering, Civil and Environmental Engineering serves the basic needs of society through construction and maintenance of the public works and infrastructure, and pursues harmony with nature. Civil engineers are involved in planning, designing, researching, constructing, managing, and maintaining infrastructure systems such as bridges, highways, subways, airports, tunnels, seaports, water supply and reclamation networks, power generation and distribution facilities, transportation, and various environmental and sanitary facilities.

Each project has unique characteristics that challenge civil engineers to apply their knowledge with initiative and creativity to fulfill the objectives, protect society, and meet the construction and operating budgets. These complex goals require not only knowledge of engineering, but also knowledge of the social, economic, and managerial sciences and collaboration with experts in these areas. The field of Civil Engineering has expanded lately into biotechnology for environmental restoration and into materials for construction and other uses. The types of projects in which Civil and Environmental Engineers are involved vary widely, but they are all broadly based on a system of shared knowledge and scientific principles of mechanics, systems analysis, mathematical tools, properties of materials, engineering design principles that ensure safety, reliability, and economy.

Research that seeks to improve projects and systems as well as engineers' capabilities is an important activity in the department of Civil and Environmental Engineering at Kookmin University. Our department is nationally recognized for its leadership in research and education. Our faculty are known nationally for their strong research activities, supported by extensive external funding. Our programs give graduate students a solid foundation to begin careers in professional practice and research.

### **□ Structural Engineering major**

The structural engineering program of the Department of Civil and Environmental Engineering, in Kookmin University, offers excellent opportunities for study and research leading to advanced degrees in the areas of structural analysis and design, mechanics of structures, and materials in structures and construction. The active involvement of our faculty in many research projects and in the solution of challenging real world engineering problems results in an instructional program that is up-to-date and relevant. Graduates from our program have gone on to become leaders in private practice, government service, education, and research.

### **□ Geotechnical Engineering Major**

Geotechnical engineering merges geotechnics, geophysics, geomechanics, and geology

and focuses on the behavior of natural materials in engineered systems. The geotechnical engineering program at Kookmin University encompasses both traditional and emerging topics in the field, including advanced techniques for site and material characterization; constitutive and micromechanical modeling; natural and man-made hazard mitigation; engineered soils; and foundation design, slope stability, and excavation support.

#### ☐ Hydraulic Engineering Major

Hydraulic Engineering major deals with water related problems in civil engineering. This field of study can provide hydraulic or hydrologic data for hydraulic structures, such as pier, levee, bank, breakwater, harbor, dam, reservoir, floodplain, etc. Hydraulic structures protect us against water related natural disaster, like flood, drought, tsunami, etc. The courses in hydraulic engineering major are fluid mechanics, hydraulics(I and II), hydrology, coastal engineering, port engineering, water resources engineering, etc.

#### ☐ Environmental Engineering Major

Environmental Engineering aims to protect nature and humans from artificial pollutants while preserving the ecosystem. It is a study for ensuring health, safety, and well-being of human life by improving and preserving quality of our surrounding environment. This major will cover water pollution, water environment system solid waste & water pollution treatment, waste resources, advanced water and wastewater treatment, **seawater desalination, wastewater reuse**, and environmental analysis.

#### ☐ Courses

##### ☐ Core Courses

##### • **Advanced Numerical Methods for Engineering (3)**

Introduction to computer programming with the emphasis on numerical techniques as applied to engineering problems. Development of mathematical models and computer programs using a compiled language (FORTRAN). Formulation and solution of initial and boundary value problems with emphasis on structural analysis, fluid flow, and transport of contaminants.

##### • **Fundamentals of Finite Element Method (3)**

Basic knowledge of finite element method and FEM theories based on energy principles will be studied. Basic development of element model, programming, and examples will be treated.

##### • **Theory of structural reliability (3)**

Review of concepts of probability theory, **lean**, analytical and numerical methods for reliability analysis and apply **them** for civil engineering problems.

- **Digital signal processing in civil engineering (3)**

The fundamental theories and applications of digital signal processing on civil engineering will be covered. Civil engineering signals and systems. Discrete time and frequency domain operations. Inverse problems. Matrix-based and other solutions. Tomography. Civil engineering examples.

- **CAD in civil engineering (3)**

Learn how to draw 2D and 3D digital plans for design and finite element analysis in civil engineering field, and apply drawing techniques to real in-depth civil projects.

- **Safe construction technology (3)**

The construction techniques to mitigate the natural hazards such as earthquake, typhoon and inundation will be reviewed. The scientific/engineering principles of those techniques will **also be** covered.

- **Esthetic Aspects of Civil Structures (3)**

Study shape, color, texture, proportion, balance, harmony, characteristics of formation, design concept of civil structures, and investigate on relation between structure shape and mechanical safety.

□ Structural Engineering Major Courses

- **Advanced Structural Mechanics (3)**

Structural analysis using energy principles, stiffness method, flexibility method, analysis of special structures, torsional and bending theory for thin-walled members, and fracture theories will be learned.

- **Advanced Construction Materials (3)**

Hydration of cement, concrete mixture design, curing of concrete, construction, special concrete, concrete durability, various experimental methods, mechanical properties of fresh and hardened concrete are studied.

- **Advanced Design of Concrete Structures (3)**

Advanced analysis method including strut-tie method will be studied. Various characteristics of concrete including time dependent behavior, durability, strain-softening, experimental techniques, inelastic and plastic analysis, and fracture mechanics will **also be** covered.

- **Advanced Steel Structure Design (3)**

General torsion of thin-walled open, closed, and combined open and closed sections: general instability of thin-walled members: consideration of residual stress: fatigue strength.

- **Experimental Stress Analysis (3)**

State of stress, stress-strain relationship, strain measurement, strain gages, strain gage circuits, analysis of strain gage data, basic optics, theory of photoelasticity, and Moire method will be studied.

- **Advanced Bridge Engineering (3)**

Design load for bridges: analysis and design of plate girder, box girder bridges, truss bridge, arch bridge: behavior of cable supported bridges: construction method such as FCM, ILM, etc.

- **Theory of Elasticity (3)**

Selected problems of stress and strain in rectangular and polar coordinates. Failure theorem. Torsion and bending of bars.

- **Dynamics of Structures (3)**

Single degree of freedom system and multi degree of freedom system of beams, frames, plate members subjected to free vibration, dynamic loading will be analyzed. Introduction to seismic design will also be studied.

- **Finite Element Analysis (3)**

Development of finite elements for plate, shell, rigid body motion will be studied. Galerkin method, dynamic analysis using FEM, and nonlinear analysis will be studied.

- **Fracture Mechanics (3)**

Fracture behavior in solids, linear elastic fracture mechanics: stress analysis of cracks: generalization of fracture criteria: fracture toughness testing: fatigue analysis and fracture control plan.

- **Advanced Composite Structures (3)**

Classification and characterization of composite materials. Behavior in the elastic range. Stress strain relations for anisotropic media. Orthotropic laminae. Plane problems. Theory of anisotropic plates. Bending, buckling and vibrations of laminated plates.

- **Advanced Prestressed Concrete Design (3)**

Fundamental principles of prestressed concrete analysis, prestress losses, flexural analysis, flexural design, shear and torsion, composite beams, continuous beams, and various applications of PSC will be studied.

- **Stability of Structures (3)**

Elastic and inelastic buckling of column and thin-walled members: lateral torsional buckling: stability problem of plate and shell including post buckling strength: Approximate and numerical methods of solution.

- **Theory of Plates and Shells (3)**

Plates and slabs loaded transversely in their plane. Buckling and post buckling behavior of elastic and inelastic plates. Membrane and bending analysis of cylindrical, rotational, hyperbolic shells.

- **Special Topics in Structural Mechanics (3)**

Special topics in structural mechanics issues will be studied.

- **Special Topics in Structural Engineering (3)**

Special topics in structural engineering issues will be studied.

- **Cold-Formed Steel Structure Design (3)**

Analysis and design for the composite panels consist of cold formed steel wall studs with wallboard are introduced. Typical failure mode estimation due to global and local bucklings according to specific design manual are also included.

- **Non-destructive analysis (3)**

Ultrasonic methods of inspection, acoustic methods of inspection, visual methods of inspection, vibration methods and modal analysis, application of NDE inspection in Engineering problems will be studied.

- **Seismic Design (3)**

Study theories for seismic design, and **practice** seismic design for general, nuclear or special structures.

- Geotechnical Engineering Major Courses

- **Advanced Geotechnical Engineering (3)**

Application of geotechnical theories and principles in construction engineering

practice. Introduction to the following topics in practice: Slope stability, retaining structures, shallow and deep foundations, soil improvement, and so on

- **Advanced Soil Mechanics (3)**

Identification and evaluation of physical, chemical and mechanical properties affecting the engineering behavior of geomaterials

- **Advanced Foundation Engineering (3)**

Soil exploration, sampling, and in-situ testing techniques. Bearing capacity, stress distribution, and settlement. Design of shallow and deep foundations

- **Subsoil Exploration (3)**

Field and laboratory testing and sampling of geomaterials, primarily soils and rocks. Methods of drilling, probing, and in-situ measurements to determine stratigraphy and engineering parameters for analysis

- **Numerical Methods in Geotechnical Engineering (3)**

Numerical methods and techniques to resolve geotechnical engineering problems using computer softwares with emphasis on various geotechnical engineering examples

- **Seepage through Soil (3)**

Theory of water transportation through soils. Application of seepage theory to practical civil engineering problems. Introduction to embankment and dam engineering

- **Soil Behavior (3)**

Mechanical response of soils with respect to the various stress states e.g. geostatic loading and stress history issues. Evaluation of stress-strain relationships, undrained drained shear strength, compressibility and hydraulic conductivity of soils using laboratory and field testing methods

- **Soil Improvement (3)**

Introduction to various soil improvement by using enforced drainage, dynamic compaction, grouting, explosion compaction, etc. Case studies of soil improvement.

- **Soil Dynamics (3)**

Principles of dynamics. Soil behavior under monotonic dynamic loading conditions. Foundation design for vibratory loadings. Introduction to earthquake engineering. Design of embankments and retaining structures under earthquake.

- **Dam Engineering (3)**

Principles of analysis and design for earth and rockfill dam structures. Construction materials, construction methods, internal and external stability, seepage and drainage, performance monitoring, abutment and foundation design.

- **Advanced Retaining Structure Analysis (3)**

Earth pressure theories. Design of rigid, flexible, braced, tied back, slurry, and reinforced walls. Stability of excavation, cut, and natural slopes.

- **Rock Mechanics (3)**

Geological and engineering classifications of intact rock, discontinuities, and rock masses. Laboratory and field evaluation of rock properties. Design of foundations on, and openings in rock masses. Analysis of rock slope stability.

- **Excavation Engineering (3)**

Introduction to excavation methods. Equipments for excavation. Stability and safety analysis of excavated faces. Support systems for excavation.

- **Special Topics in Soil Mechanics (3)**

Special research topics related to soil mechanics are selected by the students with the advice of the faculty members in charge and are pursued either independently or in conjunction with others.

- **Special Topics in Foundation Engineering (3)**

Special research topics related to foundation engineering are selected by the students with the advice of the faculty members in charge and are pursued either independently or in conjunction with others.

- **Soils and Waves (3)**

Characterization of materials with mechanical and electromagnetic waves. Emphasis on particulates with extensions to other materials. Laboratory and field applications.

- Hydraulic Engineering Major Courses

- **Flow in Open Channel (3)**

Energy and momentum principles in open channel flow: uniform flow: gradually varied flow: rapidly varied flow: unsteady flow: flood routing.

- **Advanced Mechanics of Fluids (3)**

Basic concepts and definitions: pressure distribution in a fluid: governing equations and boundary conditions: integral and differential analysis: dimensional analysis and similarity: experimental analysis: laminar and turbulent internal and external flows: potential flows: engineering applications.

- **Computational Hydraulics (3)**

General review of numerical methods: one dimensional unsteady flow: quasi two dimensional unsteady flow: unsteady dispersion in rivers: water and sediment routing in rivers: calibration.

- **Advanced Hydrology (3)**

Hydrologic cycle, processes, observations: flood flows, hydrologic design using statistical methods.

- **Hydrodynamics (3)**

Hydraulics of pressure conduits and open channels, dimensional analysis, flow measurements, hydraulic machinery, with laboratory.

- **Coastal Hydrodynamics (3)**

Waves, tides, harbor oscillations: coastal structures, estuary dynamics, salinity intrusion, sediment transportation in estuaries: beach processes and evolution.

- **Water Resources System (3)**

Planning and economics of water resources projects: stochastic basis of design: flood control: river navigation works: hydraulic machinery: hydroelectric power systems: classification, functions of hydraulic structures: hydraulic design of spillways, energy dissipators, gates, outlet works: design of canal, other water conveyance structures: design of municipal and industrial outfall structures.

- **Stochastic Hydrology (3)**

Common probabilistic models used in hydrology, hydraulics, and water resources: derived distributions: multivariate model and estimation of model parameters: analysis of data and model building: uncertainty analysis.

- **Mechanics of Sediment Transport (3)**

Laws governing fall velocity, applications to particle size analysis: incipient motion, bed forms, bed load, suspended load, natural river processes: theory and practice of movable bed model experiments.



- **Porous Media Hydrodynamics (3)**

Governing equations of groundwater flow through porous media: interaction of surface and groundwater flows: groundwater contaminant transport: numerical methods, parameter estimation applications to groundwater models: hydraulics of wells: seepage analysis, land drainage systems.

- **Hydraulic Analysis of Unsteady flow (3)**

Unsteady flow in closed conduits: method of characteristics: transients caused by centrifugal pumps: transients in power plants: resonance: transient cavitation: surge tanks: transients in open channels:

- **Hydraulic Modeling (3)**

Review of theory: importance of experiments: modeling and scaling laws: experimental environment and facilities: measurements at full scale and on scaled models: use of wind and water tunnels, towing tanks, hydraulic flumes: instruments for measuring pressure, temperature, velocity, turbulence: error analysis: data acquisition and processing: laboratory demonstrations, hands on experiments, project.

- **Mixing in Water (3)**

Review of classical diffusion theories: longitudinal dispersion, transverse and vertical mixing in free surface turbulent shear flow: application to natural channels: selected topics including stream tube models, mixing and dispersion of heated effluents.

- **Special Topics in Coastal Engineering (3)**

Presentation and discussion of selected topics relating to coastal engineering. A wider range of matter and method permissible.

- **Special Topics in Hydraulic Engineering (3)**

Presentation and discussion of selected topics relating to hydraulic engineering. A wider range of matter and method permissible.

- **Environmental Engineering Major Courses**

- **Advanced Water Supply Engineering (3)**

This course covers design water treatment processes including conventional and advanced treatment processes through basic principles and experiments.

- **Advanced Wastewater Treatment Engineering (3)**

Process design of wastewater treatment plants, including primary, secondary and advanced treatment through understanding wastewater treatment principles and experiments.

- **Advanced water pollution (3)**

Topics include the cause and damage of water pollution, the control techniques of water quality through theoretical and experimental practice.

- **Water supply network design (3)**

Topics include various tools for the analysis of water supply networks, optimum design and autocad of water supply networks.

- **Sewage system design (3)**

Topics include optimum design and drawing of sewer system using computer simulation.

- **Industrial Wastewater Treatment (3)**

Topics include fundamentals of chemical, physical, and biological unit processes, and application of the processes for the wastewater treatment.

- **Solid Waste Treatment and Disposal (3)**

Topics include techniques of collection, transport, and treatment of solid waste. It also covers final treatment processes such as incineration, landfill, and resource recovery, and associated groundwater pollution and site remediation.

- **Environmental Impact Assessment (3)**

Topics of legislative requirement, environmental effect, impact prediction and assessment methodologies to be included in project planning and construction.

- **Special Topics in Pollution (3)**

The course discusses the environmental and sanitary issues, especially water and wastewater systems in a seminar format.

- **Special Topics in Environment (3)**

The course discusses the environmental and sanitary issues, especially water, air, and solid waste treatment in a seminar format.

- **Water purification facility design (3)**

Fundamental principles in constructing water purification systems. Major topics include the planning and management of water resources and integrated designs of municipal water treatment plants and sludge discharge facilities

including water distribution system, and pumping stations. Practical design exercises are provided.

- **Wastewater treatment facility design (3)**

Design and theoretical understanding of environmental processes in wastewater treatment; mainly physical and chemical processes, and reactor configurations commonly used for effluent quality control; applications to the design of specific wastewater treatment plant operations.

- **Conservation of aquatic environment (3)**

This course will cover the progress of understanding environmental problem in rivers, lakes and reservoirs. The subject matter includes effects on nature and ecosystems from human activities.

- **Industrial Waste Water Treatment plant design (3)**

This course will examine industrial wastewater sources and characteristics, significance of industrial wastewater as environmental pollutants and application. It also cover various unit processes of physical, chemical and biochemical treatment in industrial wastewater treatment plants.

- **Solid waste treatment plant design (3)**

The course will cover theory, planning, and application of sources and characteristics of municipal solid waste, physical/chemical composition, storage, collection, transportation, and treatment and disposal procedure.

- **Special topics in water pollution (3)**

This course will cover the principles of and ecosystem and water system in rivers, lakes and reservoirs. Special topic in water pollution and specific treatment process will be discussed.

## ☐ **Faculty Members**

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## **Dept. of Electronics Engineering**

Department of Electronics Engineering has been offering one of the most comprehensive research and instructional programs, after initiating Master's and Ph.D. degree programs in 1988 and 1992, respectively. Each year, a large number of students more than 30 succeed in their degrees. Currently, we have 32 members of faculty and 24 laboratories: Broadband Communications Laboratory, Communication Convergence Laboratory, Computer Engineering Laboratory, Control Systems Laboratory, Convergence Bioelectronics Laboratory, Information and Control Laboratory, Integrated Circuit Design Laboratory, Integrated Systems Laboratory, Intelligent Robotics Laboratory, IT Security and Privacy Laboratory, Multimedia Communication Signal Processing Laboratory, Multimedia Laboratory, Multimedia Signal Processing Laboratory, Nano Devices and Systems Laboratory, Network Computing Laboratory, Power Electron Systems Laboratory, Power Electronics Laboratory, Power Electronics System Laboratory, Semiconductor Devices and Integrated circuits Laboratory, Smart Embedded System Laboratory, Smart Grid Laboratory, Ubiquitous Convergence Technology Laboratory, Wireless Network and Communication Laboratory, Wireless Sensing Laboratory.

The department's close ties to industry, coupled to its commitment to engineering research and education, ensure that every student explores his/her professional carrier in the government, research centers, and venture companies.

The goal of the graduate school of electronics engineering is to produce highly trained, competent electrical, electronic and computer engineers, researchers, and scholars to meet the needs of our fast-changing industrial and information society. The areas of active research program and related graduate courses include: Control and Instrumentation, Microwave Engineering, Circuits and Systems, Communication Engineering and Systems, Digital Signal Processing, Computer Engineering, Integrated Circuit Design, Semiconductor Devices, Robotics, Electric Power Systems, Wireless Communication Systems, Microwave and RF Circuits Design, Digital Signal Processing, Speech and Image Processing, Computer Architecture, and VLSI System.

There are two majoring programs: the Electronics Engineering program and the Microwave Communication Engineering program.

### **□ Electronics Engineering Major**

This major division primarily deals with the principal courses and Research topics include Power Electronics, Digital electronics involving the Communication and Signal Processing, Communication system with optics, Automatic and Modern control, Semiconductor with integrated circuit technologies, CAD, intelligent system, and Computer Engineering.

## ☐ Microwave Communication Engineering Major

This division primarily deals with the broad area of microwave communication engineering and communication systems. Of these, microwave communication engineering is a field study which explores electromagnetic waves for mobile communication, satellite communication, astronomy communication, and broadcasting. The communication system seeks more efficient and reliable methods of exchange and/or storage of information and knowledge in the form of audio, video, and data. The curriculum covers a broad spectrum of topics, including: RFIC/MMIC, ultra-high frequency, satellite and mobile communications, digital signal processing, networking technologies, and RFID/USN.

## ☐ Courses

### ☐ Core Courses

#### • **Advanced Power Electronics (3)**

In this lecture, advanced topics in power electronics, including the design of the high efficient power conversion circuits and magnetics in the power converter, will be discussed.

#### • **Intelligent System Applications in Power Engineering (3)**

This course provides students with fundamental theories about advanced control and optimization methods based on artificial intelligence for power system applications. This course will cover practical issues on smart grid control and operation such as renewable energy control, microgrids, advanced energy management system, ancillary service and so on.

#### • **DSP Applications (3)**

This course deals with various kinds of application which uses digital signal processing technology. Topics may include but not limited to data compression, speech/audio processing, DSP in digital communication, image/video processing, biomedical signal processing, and hardware implementation.

#### • **Embedded Control Systems (3)**

This course covers an overview of embedded control systems based on microcontrollers. Concepts of the microcontrollers, embedded systems, digital control design and embedded control systems are introduced. Also, various applications for embedded control systems such as robot systems and automobile systems are discussed.

- **Semiconductor Physics (3)**

In this lecture, semiconductor physics, including crystal lattice structures, properties of semiconductors, wave phenomena and magnetic properties, electron emission, carrier generation and recombination property in the semiconductors, will be discussed.

- **Wireless Networks (3)**

The course includes the wireless networks protocols and physical layers for wireless multimedia applications. It covers WLAN, WPAN, ad-hoc networks, and sensor networks. The course also deals with IPv6, Mobile IP, Cellular IP, and QoS MAC protocols.

- **Nanostructure Semiconductor Device Technology (3)**

The principle, characterization, analysis, and applications of nano-structure electrical and optical devices, which focus on the quantum effects in the semiconductor, will be discussed in this lecture.

- **SoC Design (3)**

The methodology for the IP-based SoC (system-on a chip) design will be discussed in detail. The hardware-description languages of VHDL or Verilog-HDL as a basic design tool for the SoC design will be studied, and the synthesis of digital circuits, verification methods, an auto-placement and routing technique in the layout design will be taught in hand. Some standards for the coding guideline and mixed-mode specs will be also introduced.

- **Mixed-Mode Integrated Circuits (3)**

Main subsystems of the mixed-mode integrated circuits, based on a standard CMOS process, will be discussed. Issues on the design of analog filters adopting switched-capacitor circuits, A/D converters, D/A converters, PLL (phase-locked loop) and DLL (delay-locked loop) will be studied in depth.

- **Next Generation Internet (3)**

We deals with IPv6-based service, Internet architecture, protocols, and standardization. Internet architecture for convergence with wireless networks and broadcasting networks, will be studied. IPv6-based Mobile IP, TCP, traffic management, security, Internet QoS, traffic modeling, VoIP, Dual IP stack, and media independent handover will be studied.

- **Linear Systems Theory (3)**

The course will address both continuous-time and discrete-time representations

and both time-invariant and time-variant systems. Topics covered include: (1) Fundamental linear space and matrix concepts: (2) Signal representations, properties, transforms, and sampling: (3) System representations, properties, and transforms. The goal of this course is to provide the beginning EE graduate student with the foundations and tools of signal and linear system theory, necessary for subsequent courses in the overall electrical engineering program i.e., the communications and signal processing program, and control program.

- **Digital signal Processing (3)**

The processing of signals by digital techniques. Topics include discrete-time signal and system theory, the design, analysis and implementation of FIR and IIR digital filters, discrete and Fast Fourier Transforms, and applications to speech, picture processing, and data communications.

- **Communication Theory (3)**

This course briefly reviews the mathematical analysis of the signals and systems, focused on the transform domain manipulation of the signals and systems. The main part of the course is the theory and engineering of the analog communication system which include amplitude modulation, Frequency modulation, and phase modulation. It also deals with basic digital communications with channel noise.

- **Digital Control Theory (3)**

This course is intended to facilitate the students in gaining familiarity with sample theory, z-transform, and other analysis tools that are used to analyze and design digital control systems. This course covers the state space and input/output representation, modeling and analysis of digital control systems, the design of digital controller through emulating continuous-time controllers, state feedback control, state observer design, observer based compensator design, LQ optimal control, internal model based design, and servo control with digital controller implementation.

- **Network Synthesis and Filter Design (3)**

This course will cover an introduction which explains the differences between network analysis and synthesis. Butterworth, Chebychev and Bessel filter design are studied in depth for given specifications. Synthesis techniques are dealt with to realize the all-pole filters.

- **High-Speed and High-Frequency Semiconductor Devices (3)**

In this lecture, high-speed and high frequency characteristics of microwave- and



millimeterwave devices, which include compound semiconductor devices such as HEMTs (high-electron mobility transistor) and HBTs (heterojunction bipolar transistors), will be discussed in detail. Design, implementation, and characterization techniques will be discussed for better electrical performances.

- **Application Specific Integrated Circuit Design (3)**

Analog and digital IC designs for a single-chip implementation of the application-specific integrated systems with signal processing, automatic control, artificial intelligence, and image processing.

- **Microwave Circuits Design (3)**

This course focuses on understanding the design theories of impedance transformers, microwave filters, phase shifters, amplifiers, and so on. Furthermore, we lecture the analysis and design methods for various microwave circuits by using computer aided design techniques.

- **Digital Image Processing (3)**

Representation, analysis, and design of two-dimensional signals and systems. Two-dimensional Fourier transform, z-transform, discrete Fourier transform, discrete cosine transform, and fast Fourier transform algorithms. Image processing basics. Image enhancement. Image restoration. Image coding. Additional topics including PC-based image processing systems.

- **Digital Communication System (3)**

This course is devoted to a detailed and unified treatment of digital communication theory as applied to communication system focused on the system reliability. Topics include source coding, signal encoding, representation, and quantization; methods of modulation, synchronization, and transmission; optimum demodulation techniques; and communication through band-limited and random channels.

- **Digital Circuit Design (3)**

Design procedure of the microcomputers based on the synthesis of digital devices will be trained, and its application capability by learning the algorithm of the digital circuit design will be enhanced.

- **Digital Communication Engineering (3)**

This course will deal with PAM, PPM and PDM theory including carrier systems.

- **Parallel & Distributed Processing (3)**

This course covers key concepts and techniques underlying the design and

engineering of parallel/distributed processing. The following are the objectives of this course:

- Understanding key concepts of parallel/distributed processing
- Understanding characteristics of parallel/distributed computing architectures.

- **Random Process and Estimation Theory (3)**

Fundamentals of probability and random processes and their applications to information sciences and systems. Topics include linear and nonlinear estimation theory with special interest on the theory and application of Kalman filters.

- **Information and Coding Theory (3)**

An exploration of the probability theory in information transmission, covering noiseless source coding theory of ergodic sources and channel coding theorems. Advanced topics in selected areas in signal processing, communication and information theory, decision and control, and system theory.

- **Data Structure (3)**

This course emphasizes the concept of abstract data types (ADTs) and object-oriented design paradigms. The course covers common data structures such as lists, trees, heaps, graphs, etc.

- **Operating System (3)**

This course covers in detail many advanced topics in operating system design and implementation. It starts with topics such as operating systems structuring, multi-threading and synchronization and then moves on to systems issues in parallel and distributed computing systems.

- **Network Architecture (3)**

This course discusses about the concepts and mechanism of computer network systematically and hierarchically according to the computer network's architecture. It covers RS232C, X.25, Ethernet, Token Ring, and TCP/IP as a case study.

- **Real Time Processing (3)**

An introduction to the problems, concepts and techniques involved in computer systems that must interface with external devices: computer characteristics needed for real time use, operating system considerations, analog signal processing and conversion, and inter-computer communication.

- **CMOS RF Integrated Circuits (3)**

This course covers CMOS RF device models, RF transceiver architectures, LNA, mixer, VCO, power amplifier, VGA, filter, PLL, RF package modeling, and so on.

- **Characterization of Semiconductor Materials and Devices (3)**

In this lecture, analysis, modeling, parameter extraction method of the characterization parameters and their applications for the electrical and optical characteristics of the semiconductor devices will be discussed in detail.

- **Antennas Engineering (3)**

This course covers the basic concepts of antenna and propagation, the numerical methods to design an antenna including frequency domain methods (Moment method) and time domain methods (Finite Difference Time Domain method). This course discuss various antennas in wireless communications, such as small antennas, array antennas, parabolic antennas, planar antennas, etc.

- **RFID System Engineering (3)**

This course covers the basic concepts of RFID system engineering, the RFID system modeling including a reader and a tag, the anti-collision algorithm, the RFID reader and tag architecture, the prediction of interrogation range, the frequency interference due to nearby RFID readers. Also, this course discusses the simulation methods of RFID system using MATLAB.

- **Analog Integrated Circuit Design (3)**

Analog signal-processing chip design based on a standard CMOS process will be discussed in this lecture. In the first, the basic concept of analog signal-processing with various transformation techniques including the z-transform and the op-amp, which is a basic building block in the analog signal processing circuits, will be taught in detail. The concept of the switched-capacitor filter for accurate analog signal-processing and its application analog filters will be also considered in the lecture.

- **Digital VLSI Design (3)**

Based on the knowledge on the fundamental digital logic and CMOS technology, this course aims to convey a knowledge of advanced concepts of circuit design for digital LSI and VLSI components in state of the art CMOS technologies. Emphasis in this course is on the circuit design, optimization, and layout of CPU, ALU, register file, digital filter, RAM, ROM, and so on.

- **Theory of Spread Spectrum Communication (3)**

Topics include synchronization techniques in direct sequence and frequency hopping spread spectrum systems.

- **High Power Switching Circuit (3)**

The design and implementation methodologies of high power conversion circuits employing IGBT and SCR will be covered in this course.

- **Power Electronics System (3)**

This course will provide the specific view of designing UPS, AVR and SMPS.

- **High Efficiency Power System (3)**

This course will handle the methodologies of implementing the high efficiency power system employing the soft switching techniques.

- **Signal Detection Theory (3)**

Hypothesis testing: detection and estimation of signals in noise: detection of signals with unknown parameters: prediction and filtering of stationary time series: detection of stochastic signals: and nonparametric and robust techniques.

- **Optical Communication Engineering (3)**

Principles and applications of LED, LD, optical modulation and demodulation, optical fiber are discussed. Optical communication systems including WDM, SCM, TDM are discussed.

- **Mobile Communication System (3)**

The course deals with fundamental theory and characteristics of analog communications and digital communications. The course introduces basic concept of cellular, roaming, hand off, and PCS.

- **Satellite Communication System (3)**

The course covers system planning, link budgets, modulation, coding, multiple access, VSAT network operation, beam switching, and antenna characteristics. This course discusses OBP, air interface, and networking protocols.

- **Nonlinear Control System (3)**

The objective of the course is to provide an understanding of the behavior of nonlinear dynamic systems and the techniques available for analysis and control of dynamic nonlinear systems: exposure to techniques that are useful in the engineering practice. This course covers phase plane method, Lyapunov stability analysis method, feedback linearization method, sliding mode control method, and adaptive control method.

- **Advanced Topics on Mechatronics (3)**

This course provides a lecture on mechatronics system which is effective combination of mechanical system, control engineering and the newest electronics. This course discusses theory of various actuation systems such as AC, DC electro-magnetic motors, mechanical-electrical system modeling and their digital control techniques.

- **Advanced Vehicle Electronic Control Systems (3)**

The course starts with the outline of automotive electronics and covers basic principles of power train control, vehicle control (chassis control) including brakes, suspension and steering. Body control including wipers, windows, and doors control is studied with microprocessor-based implementation technologies. In-vehicle networking protocols and the standardization on the software platform are also introduced.

- **Advanced Topics on Embedded Software (3)**

This course provides an overview of embedded software design concurrent with the embedded hardware design. It covers basically modern methods of embedded software design based on real-time operating system. Also, various topics on RTOS, UML, MDA, platform abstraction, multi-processor SW and their applications will be discussed.

- **Embedded Real-Time Operating Systems (3)**

This course covers embedded real-time operating system for handset, robot and automobile. Concepts of the embedded real-time operating system will be introduced with embedded system test kits. Also, commercialized embedded real-time operating systems and their applications for handset, robot and automobile will be discussed.

- **Advanced Topics on Intelligent Robots (3)**

This course provides opportunity to understand theory and practice of the latest intelligent robots. Coverage of this course includes robot navigation, robot control, robot sensing, human robot interaction and other topics related to robot technology in daily life. This course encourages multidisciplinary studies and applications in various fields of robotics.

- **Network Simulation (3)**

This course deals with the fundamental concept and principles of discrete event simulation. Network simulation methods including ns-2 will be studied. As a case study, we will implement and evaluate network algorithms such as TCP

congestion control, buffer management, WLAN, and ad-hoc networks. Then, the way to show the simulation result will be discussed.

- **Advanced Topics in Wireless Network (3)**

Advanced topics in the state-of-the-art network research areas such as next-generation wireless networks, next-generation IMS, SDR, cognitive radio networks, and cross-layer optimization methods will be discussed.

- **Power Conditioning Systems for Wind Power Systems (3)**

This course provides students with technical knowledge about characteristics of wind turbines and advanced techniques for system design and control schemes for power conditioning systems for wind turbines.

- **LED Drive System (3)**

In this course, students will learn about fundamental characteristics of light-emitting diodes (LED), advanced circuit design and control techniques for LED drive system, and advanced system analysis methods for performance evaluation of LED drive system.

- **Advanced Power Converter Design (3)**

The course objective is to introduce students to the basic power converter topologies and to analyze and design advanced power conditioning converters. This course covers power electronic devices, regulated bus converters, unregulated bus converters, AC/DC converters, DC/DC converters, AC/AC converters, and resonant converters.

- **Single-Stage Power Conversion Circuit (3)**

The course objective is to enhance the importance of power factor correction (PFC) by exploring some concepts related to standards, total harmonic distortion (THD) and PFC circuits. The course deals with the concepts and implementation methodology of the single stage PFC converter including analysis, modeling, design, and control.

- **Advanced Microprocessor Design (3)**

This course provides students with understanding of various microprocessor architectures. It is concerned with the hardware design issues of microprocessor systems: instruction set selection, arithmetic/logic unit design, clocking strategy, hardwired and micro-programmed control systems, memory organization, I/O interface design, and computer simulation of digital systems.

- **Advanced Digital System Design (3)**

This course covers basic concepts and design methodology for digital circuits and systems including automatic synthesis at various levels of abstraction, timing analysis and timing closure, and testing and testable design. This course puts emphasis on providing students with hands-on experience on digital systems. The course includes both lecture and laboratory work on the topics of: hardware description language (e.g., Verilog and VHDL), combinatorial logic, synchronous sequential circuits, algorithmic state machine, and asynchronous sequential circuits.

- **Advanced Topics on Computer Engineering (3)**

This course is designed to cover recent developments and research results in computer engineering.

- **Advanced Topics on EMI/EMC (3)**

This course covers the basic concepts of EMI (Electro-Magnetic Interference) and EMC (Electro-Magnetic Compatibility), the analysis methods in time and frequency domain, and the various techniques to resolve EMI/EMC problems, including crosstalk, shielding, PCB artwork, power supply filters, conducted susceptibility, radiated susceptibility, etc.

- **Advanced Topics on MEMS Engineering (3)**

This course covers MEMS (Micro-electromechanical Systems) technology for wireless and RF applications including MEMS switch, MEMS phase shifter, MEMS inductors, etc. Also, this course discusses the electromagnetic modeling for analyzing MEMS circuits, the reliability and packaging issues, the process methods, and various MEMS sensors such as Gyro and accelerometer.

- **Ultra Low Power Communication Engineering (3)**

This course covers the basic concepts of ultra-low power communications, the link budget calculations, the propagation issue, the transmitter and receiver architecture, the Modem architecture. Also this course discusses the recent wireless specifications including IEEE 802.15.4, zigbee and UWB (Ultra-low power), BAN (Body Area Network), etc.

- **Broadband Communication Systems (3)**

A broadband communication system utilizing optical signal and optical fiber are discussed. Asynchronous and synchronous systems, ATM, Ethernet, FDDI, Token Ring are among those systems.

- **Integrated Circuit Process Technology (3)**

Modern CMOS VLSI technology is covered in depth in this course to

understand the physical phenomena in the fabrication process and characterize the VLSI circuit. In this course, the individual process steps including epitaxial growth, lithography, oxidation, metallization, etching, and so on are discussed in details. Moreover, the integrated manufacturing processes using many individual steps are covered.

- **Special Topic on Intelligence Systems (3)**

The course will involve (1) gaining an understanding of the functional operation of a variety of intelligent control techniques and their bio-foundations, (2) the study of control-theoretic foundations (e.g., robustness), (3) learning analytical approaches to study properties (especially stability analysis), and (4) use of the computer for simulation and evaluation. The objective will be to gain a practical working knowledge of the main techniques of intelligent control and an introduction to some promising research directions.

- **Information Security (3)**

We cover in this course principles and practice of cryptography and network security: classical systems, symmetric block ciphers (DES, AES, other contemporary symmetric ciphers), perfect secrecy, public-key cryptography (RSA, discrete logarithms), logarithms for factoring and discrete logarithms, cryptographic protocols, hash functions, authentication, key management, key exchange, signature schemes, and other topics.

- **Computer and Network Security (3)**

We introduce network security concepts and mechanisms and foundations of computer and network security. We review commonly-used security mechanisms and techniques, security threats and network-based attacks, applications of cryptography, authentication, access control, security protocols, denial of service, web security, the buffer overflow attack, wireless security and privacy, and other topics.

- **Power System Control and Stability (3)**

This course is concerned with understanding, modeling, and analyzing power system stability and control problems. Students will learn about steady-state and dynamic models of AC machines and power converters in the beginning of the course. Then, they will learn about fundamental theories about various stability issues as well as active and reactive power control schemes in power systems.

- **Special Topics on Smart Grid (3)**

This course covers advanced optimization theories for control and operation of



smart grids. Advanced topics about smart grids, economic operation of power grids, and power market will be dealt with in this course.

- **Power Semiconductor Devices (3)**

Course work to understand LDMOS, DEMOS, and ultra high-voltage (higher than 700V) devices; structure, material properties, characteristics for practical applications.

- **Power IC Design (3)**

Principles and techniques of design of power electronic circuits in BCD(Bipolar, CMOS, DMOS) process. Circuit issues and practical designs with focus on semiconductor for vehicles, household AC/DC converters, power supplies, and display drivers will be discussed.

- **Topics on Computer Architecture (3)**

This course provides an overview of the concepts employed in the design of high-performance computer systems, with a focus on quantitative analysis of the implications of design decisions and their effects upon design of efficient compilers and operating systems.

- **Research Ethics & Thesis Study (3)**

Graduate students will develop an understanding of the nature of ethical decision-making and its role in research ethics. They will also acquire an appreciation of the reasons for conducting ethical review of research and an awareness of some of the international codes of research ethics that have been developed in response to scandals and abuses in research. Finally, they will understand the nature and definition of research ethics and an appreciation of the importance of good research.

- **Bio-System Control (3)**

In this course we first analyze human physiology from a systems perspective based on mathematical methods. The dynamic models discussed in this course are homeostatic control systems, immune response dynamics, mutation, evolution and so forth. To this end mathematical tools are employed including linear and nonlinear ordinary differential equations, Lyapunov stability analysis, mass action kinetics, and numerical analysis. Then we study applications in biomedical engineering from recent research literature.

- **Automotive Embedded Software (3)**

This course deals with automotive SW platforms, which is one of the most

important issues in automotive embedded systems. Based on the SW platform running on multicore processors, students will study the basic concept of automotive SW platform and how to design SW components. Also, application to power train, chassis and body systems will be covered.

- **Semiconductor Convergence Engineering (3)**

For the next-generation semiconductor devices, we will discuss the new types of channel materials and their application in this lecture.

- **Device-Circuit Codesign (3)**

We will discuss the advanced circuit system for novel semiconductor devices and optimize the performance of the circuit system.

- **Special Topic on IT IPR (3)**

This lecture is intended for the Graduate students major in Electrical and Computer Engineering, Information and Communication Engineering to improve and promote the ability in the areas of IT-convergence as well as information technology. The lecture content include the examination of preceding technology of IP(intellectual property), establishment of a IP-oriented strategy, making patent searches, preparing specifications and patent applications.

- **Creation and Application of IT IP (3)**

This course provides the students in the field of electronics, information and communication, and computer with the creation of IPR(intellectual property rights), information retrieval, writing patent application specifications, and answering to the refusal from the examiner concerning the patent application. Practical contents such as the basic writing of patent license contract for the technology transfer will be handled as well.

#### □ Electronics Engineering Major Courses

- **Low-Power Integrated Circuit Design (3)**

Low power circuit technology is strongly required to enhance battery lifetime especially in portable devices such as mobile phone and notebook. This power consumption can be divided into two categories of the dynamic and static consumption. Recently developed logic families and clocking strategy to reduce the dynamic power consumption are discussed in this course. In addition, static-power reduction techniques using dynamic threshold-voltage scheme, power cut-off switch, and so on are covered.

- **Memory-Circuit Design (3)**

Memory devices as a core semiconductor industry, specifically, a circuit design of DRAM will be discussed in the lecture. The principle of the memory cells, cell-arrays, circuit technologies of various peripheral circuits incorporated in the row path, column path, and the performance enhancement strategy of the overall chip in the high-speed DRAMs, including SDRAM (synchronous DRAM) or DDR (dual-data rate) SDRAM, will be considered in detail.

- **Display Engineering (3)**

Operation principle, design method, characterization and its applications of optical-electrical / electrical-optical semiconductor devices for the absorption and emission of the light will be discussed in this lecture.

- **Advanced Topics in Integrated Circuit Design (3)**

The current research trends and problems in modern CMOS VLSI design are discussed in this course. In modern very deep-submicron VLSI design, high-speed signaling and low power issues such as signal integrity, interconnect, power distribution, power consumption, and timing becomes important, as devices go scaled further down. This course aims to introduce the recent design techniques, the optimization algorithms, and the layout methodologies to solve the signaling and low power issues in modern very deep-submicron VLSI design.

- **VLSI System Design (3)**

Digital circuit technology based on the standard CMOS process will be discussed in this lecture. The delta-sigma data converters adopting digital signal-processing theory, in order to achieve a very high resolution, will be intensively considered. For this purpose, a digital signal-processing, especially the multi-rate sampling frequency system, will be taught in depth. Various types of delta-sigma architectures, digital behavioral blocks and VLSI implementation will be also treated in the lecture.

- **Modeling and Simulation of Discrete Event Systems (3)**

This course covers the modeling and simulation of discrete event systems specific to computer science and computer engineering. The use of general purpose and specialized languages for these systems will be explored.

- **Algorithms (3)**

The course studies standard methods and examples in the design and analysis of algorithms. Topics include some basic paradigms in algorithm design and analysis of the efficiency and optimality of representative algorithms selected

from some of graph, pattern matching, numerical, randomized and approximation algorithms.

- **Network Programming (3)**

This course teaches students to use network programming concepts and techniques, including the Open Systems Interconnection (OSI) seven layer model, plus how to write network programs for both stream and datagram communications with both sockets and Transport Level Interface (TLI), how to use the client-server model in network programs, how to write RPC network programs, and how to implement network security. The course covers network programming facilities in Solaris 2.X, including TCP/IP, UDP/IP, sockets, TLI, RPC, UNIX, and Data Encryption Standard (DES) network security facilities. The course introduces the basic concept of device driver, socket programming, and application programming. It also covers the internal structure of protocols for implementing application programming such as telnet, ftp, and http.

- **Modeling and Analysis of Telecommunication Networks (3)**

The course covers basic queuing theory and tele-traffic theory for telecommunication networks. It also covers analysis of M/G/1 queue, M/D/1 queue, Priority queue, Polling system, and random access systems.

- **Internet Protocol (3)**

The course covers the OSI reference model, TCP/IP protocol, UDP/IP protocol, and various applications. It also deals with internet performance, QoS architecture, traffic management, performance tuning, and QoS engineering.

- **Queuing Theory (3)**

The course deals with the probability theory, stochastic processes, Markov chain, and Markov process. The course also covers analysis of M/N/1, M/M/m, and the network of queues.

- **Advanced Topics on PFC Circuits (3)**

Many countries are legislating for limiting the harmonic contents of current flowing into the electronic systems from the power line. In order to meet this regulation, power supply should have power factor correction circuits. This course will cover the principles of various types of power factor correction circuits.

- **Advanced Topics on Magnetic Devices (3)**

Design techniques for transformers and inductors used for various types of power supply are dealt with. In order to attain this objective, basic

understandings of magnetic theory and the characteristics of magnetic materials are given. Also, winding techniques for minimizing the leakage inductance and winding loss are covered.

- **Special Topics on Power Converter Modeling (3)**

In this course, students will learn about fundamental operation principles and mathematical model derivation of various power converters for computer simulation and controller design. This course also provides students with various mathematical tool and system analysis methods for power converters.

- **Advanced Topics on Resonant Converter (3)**

It is inevitable to increase the switching frequency so that the power supply with high density is in our hand. An alternative for the high density is the resonant power conversion technique. In this course, the operating principles and control techniques of resonant converters are covered in depth.

- **Advanced Topics on Printed Circuit Board (3)**

Printed circuit board (PCB) design is the most important factor to secure the system reliability as the clock speed is getting higher. This course will cover the countermeasure against the noise and the signal integrity in the PCB.

- **Advanced Electronics Circuit Analysis (3)**

This course deals with the analysis techniques of the operational amplifier. Students are capable of designing the complex analog circuits through this course.

- **Advanced Topics on Semiconductor Device Physics & Characteristics (3)**

Electrical characteristics of unipolar-type IC devices (JFET, MOSFET, MESFET), as analog or digital IC components, will be taught in detail.

- **Advanced Semiconductor Devices (3)**

In this lecture, the current-voltage (I-V) characteristics, capacitance-voltage (C-V) characteristics of semiconductor devices, mainly focusing on the BJTs (bipolar junction transistors) and MOSFETs (metal-oxide-semiconductor field-effect transistors) will be discussed. Non-ideal and secondary effects including the process-related phenomena in the BJTs and MOSFETs will be also discussed in this lecture.

- **Advanced Digital Image Processing (3)**

Topics include optimum prediction for signal processing based on linear and nonlinear time-frequency models, adaptive signal processing, and speech

analysis-synthesis based on spectrogram. Additional topics in multirate signal processing.

- **Advanced Control Engineering (3)**

The course presents advanced analytical and logical control techniques with many practical applications. The objective of this course is (1) the introduction of recently developed control theories and successful application examples, (2) the understanding and survey of advanced implementation issues. Systems with delay, systems with noise, and systems with time-varying parameters are considered.

- **Power Conditioning Systems for Photovoltaic Systems (3)**

This course provides students with knowledge about fundamental characteristics of photovoltaic systems and advanced control schemes for power conditioning systems of photovoltaic systems. In addition, students will learn about advanced maximum power-point tracking schemes and grid integration techniques.

- **Filter Design for Power Supply (3)**

Various filter circuits in the power supply applications is introduced. Circuit topology, computer analysis, and design methods in terms of the optimization technology will be discussed.

- **Multimedia Engineering (3)**

The course deals with digital multimedia and its applications. The basic characteristics of voice, audio, image, and video that consist of the multimedia are examined and the core of audio and video codec are studied. The joint processing of audio and video is also discussed.

- **Wireless Resource Management (3)**

This course deals with the system level control of co-channel interference and other radio transmission characteristics in wireless communication systems, for example cellular networks and wireless networks. This course also involves algorithms for controlling parameters such as transmit power, user allocation, beamforming, data rates, handover criteria, modulation scheme, error coding scheme, etc. The objective of this course is to utilize the limited radio-frequency spectrum resources and radio network infrastructure as efficiently as possible.

- **Advanced Digital Signal Processing (3)**

This course deals with the advanced topics in digital signal processing area.

Topics include spectral analysis, multi-rate signal processing, VLSI implementation, and so on.

- **Advanced Microcontroller Applications (3)**

This course covers an architecture of a high performance 16/32bit microcontroller. Programming technique and hardware implementation are provided, and also application examples for mobile device, vehicle electronics and control system are presented.

- **Advanced Computer Programming (3)**

The goal of this course is to learn advanced programming skills. Students develop programs of practical value, using various programming techniques and software tools.

- **Special Topic on Microprocessor (3)**

The goal of this course is to learn recent research problems and results in the microprocessors and application systems.

- **Embedded System Design (3)**

The goal of this course is to understand system implementation issues of embedded systems, and to exercise various practical design techniques for embedded systems.

- **Digital System Architecture (3)**

The goal of this course is to understand the principles and organization of digital systems, and to learn the performance enhancing techniques and quantitative analysis methods used in contemporary digital systems.

- **Microwave Communication Engineering Major Courses**

- **Advanced Topics on Multiple Antennas (3)**

This course provides understandings on the basic concept of array antenna, the detection of direction, and the digital beam formation, etc. Also, this course discusses the smart antenna system involving the linear array and circular array antennas.

- **Advanced Theory of Adaptive Signal Processing (3)**

Main topic of this course is the statistical signal processing techniques. This course gives lecture on the various signal processing techniques including the radar signal processing, acoustic signal processing, communication signal processing, bionic signal processing, etc. based on the adaptive filtering

discrete signal and system theories.

- **Internet of Things (3)**

This course introduces the fundamental concepts of the internet of things and its applications and architecture models. This course introduces the technologies and mechanisms for sensing, actuation, processing and cyber-physical data communication. This course discuss radio-frequency identification (RFID), near field communication(NFC), barcodes, QR codes and digital watermarking. This course also deal with conceptual architecture of IoT, network and service architecture of ubiquitous sensor network, and IoT platform and applications.

- **Advanced Optical Communication (3)**

Various linear and non-linear properties of optical signals propagating inside optical fiber are analyzed. Attenuation, Dispersion, SPM, XPM, FWM, SBS, RAMAN are among those properties of optical fiber. Estimation and prevention schemes are also discussed.

- **Advanced Topics in Wireless Broadband Communication (3)**

The course covers the key technologies, such as wireless network, real-time signal processing, mobile communications, radio propagation, and integrated and low-power semiconductor technologies, for next generation broadband wireless communications.

- **Advanced Topics in Mobile Communication Engineering (3)**

The course includes fading phenomenon, fading effects and distribution, multiple access cellular system, channel assignment, cellular system design, channel coding and modulation techniques for mobile communications. It also includes traffic engineering, radio resource management, radio interface protocol, and basic concepts and principles for IMT-2000 and systems beyond.

- **Advanced Electromagnetic Engineering (3)**

In this course, we examine the detail analysis methods for boundary conditions of the electromagnetic field on the basis of fundamental electromagnetic theory.

- **MMIC Design (3)**

In this course, analysis and design methods for monolithic microwave active components such as amplifiers, oscillators, and mixes by using microwave CAD software are studied.



- **RF Circuits Design (3)**

This course provides the design theories for resonant circuits, filters, small-signal RF amplifiers, frequency mixers, RF power amplifiers, and so on.

- **Ubiquitous Sensor Network (3)**

We introduce ubiquitous sensor network and its applications. Sensor network protocol and sensor node's architecture will be studied. We will cover physical layer, localization, tracking, MAC protocol, network layer including routing protocols, sensor tasking and control, sensor network platform, and mesh network. Convergence with WLAN, cellular network, satellite network, and greedy system will be studied, and the future of sensor network also will be explored.

- **Mobile Computing (3)**

We deal with the overview and architectural model of distributed and mobile computing. Mobile ad-hoc network, peer-to-peer computing, pervasive computing, context-aware computing will be studied. Also, wireless communication including wireless channel and physical layer, MAC, WLAN, geometric routing, mobile agent technology, mobile IP, mobile information system, mobile distributed system, mobile information management and its application will be discussed.

- **Multimedia Communications (3)**

The course deals with video compression, multimedia applications, and multimedia information processing and presentation. It also covers multimedia network and protocols, RTP, RSVP, and DiffServ.

- **Special Study on Digital Communication System (3)**

Study on communication systems utilizing PAM, PPM and PCM.

- **Energy Scavenging Technology for Wireless Communication (3)**

The goal of this course is to understand the principles of the energy converting to micro electric power, energy management circuitry technologies for this storage, and power management circuitry technologies.

- **Wireless Circuit Design using CAD Tool (3)**

The goal of this course is to learn how to use the versatile CAD tools for the diverse Wireless Circuit and System design with the higher level understanding the principles of Wireless Communications.

- **Digital RF Technology (3)**

The goal of this course is to understand the concept of the reconfigurable software defined RF technology with the latest digital signal processing and the data converting technologies and to learn the reconfigurable RF hardware system technology.

- **Wireless Energy Transmission Technology (3)**

The goal of this course is to understand the basic principles of the wireless energy transmission with the propagating characteristics of various wireless energy medias such as optimal light, RF/Microwave, and Non-radiative near fields, and to learn the system approaches in analysis and design for the purpose of generating these wireless energy medias effectively.

- **Design Theory of Wireless Communication Filters (3)**

The goal of this course is to understand various wireless communication filters, and to learn image parameter methods and filter synthesis methods including the inverter theories.

- **Special Topic in Broadcasting and Telecommunications Networks (3)**

The course deals with recent developments and research issues in broadcasting and telecommunications networks.

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## Dept. of Computer Science

Widespread use of computers coupled with fast computer communication technology brought rapidly growing social demand for information processing technology and for its applications. Department of Computer Science provides good quality of education in both computer hardware and software as a means of information processing system. Department of Computer Science offers core courses that teach fundamental knowledge of computer science. On top of these courses, our department teaches system softwares such as database system, operating system, compilers, and computer network, and also put emphasis on practical training. There are list of courses offered to keep up with real world challenges and dynamically-evolving research trends: Computer Graphics, Multimedia System, Embedded System, Mobile Computing, Wireless Network, and E-Commerce. We also invite professionals from industry, research lab and other universities to our weekly colloquium on variety of research subject, and our colloquium is renowned for its quality contents. The students appreciate it as a good opportunity to balance theory and practice.

The faculty is highly devoted to educating and to advising students to write their thesis in high quality, and as a result, the masters and Ph.D.s trained in our department are internationally competent and recognized.

In these times when the use of computers is universal and the communication technology enhances rapidly, the society demands highly qualified IT personnel's to lead the society. Our mission is to educate students and to provide well-equipped computer professionals to the society in order to meet such need. For that purpose, department of Computer Science trains the students to have a deep understanding of fundamental knowledge in computer science. Based on such knowledge, the students are also trained to have design, development and analysis techniques in broad applications such as computer graphics, parallel and distributed computing, artificial intelligence, image processing, multimedia and computer networks.

Students majoring in computer science acquire fundamental knowledge in computer software and hardware in core courses.

Among those core courses are image processing, artificial intelligence, natural language processing, computer architecture, embedded system, operating systems, computer vision, pattern recognition, wireless network, parallel processing, and object-oriented system.

Ten research laboratories actively perform research and development projects funded by governmental agencies or industry. Knowledge acquired in course materials is exercised in the real-world applications, performing those research projects.

### ☐ Courses

#### ☐ Core Courses

- **Advanced Analysis of Algorithms (3)**

An introduction to the design of algorithms. The emphasis is on learning techniques for creating algorithms, analyzing them, and proving their correctness. Topics include models of computation, asymptotic notation for analysis of algorithms, sorting and searching algorithms, design techniques such as divide-and-conquer and dynamic programming, graph algorithms including spanning tree, shortest paths. Additional topics chosen from pattern matching, NP-hard, and NP-complete.

- **Advanced Operating Systems (3)**

Introduction to the design and analysis of operating systems. Topics include processes, mutual exclusion, synchronization, semaphores, monitors, deadlock prevention and detection, memory management, virtual memory, processor scheduling, disk management, file systems, security, protection, distributed systems. Students will present and discuss with hot issued topics.

- **Advanced Database Systems (3)**

Introduction to advanced database systems from a perspective of implementation. Topics include query processing, transaction management, concurrency control techniques, database recovery, database security and authorization, and how these concepts are implemented in real systems.

- **Advanced Artificial Intelligence (3)**

An introduction to basic concepts in artificial intelligence from a computer science perspective. We learn how to find innovative solutions to difficult, independently motivated problems, such as search, logic, knowledge representation, rule-based programming, and reasoning with programming applications.

- **Advanced Computer Architecture (3)**

Advanced topics in the architecture and organization of computer systems. Topics include how information is represented in memory, machine-language instructions and how they can be implemented at the digital logic level and microcode level, assembly language programming, input/output operations, and performance issues.

- **Advanced Computer Network (3)**

In this course, special hot issues in the recent research and development of computer network area are studied extensively. The course contents consist of

lectures, paper presentation, demo, and term project.

- **Advanced Digital Image Processing (3)**

The course will provide mathematical foundations and practical techniques for manipulation of digital images: image acquisition, preprocessing, image transforms, image enhancement, image restoration, image coding, edge detection and segmentation, feature extraction, and image analysis.

- **Advanced Distributed Processing System (3)**

An introduction to the principles underlying state-of-the-art distributed computing technology. Topics include distributed system models, networking and internet-working, inter process communication, distributed objects and remote invocation, operating system support, security, distributed file systems, name services, time and global states, coordination and agreement, transactions and concurrency control, distributed transactions, replication, distributed multimedia systems, distributed shared memory, CORBA case study and MACH case study issues.

- **Advanced Information Retrieval (3)**

This course will cover traditional material as well as recent advances in information retrieval (IR), the study of the indexing, processing, and querying of textual data. The focus will be on Korean language processing techniques and the newer techniques that try to move beyond keyword search and bring some intelligence to the task of processing and retrieving textual information, including hypertext documents available on the world-wide-web.

- **Advanced Embedded Systems (3)**

Introduction to advanced imbedded system. Topics include embedded kernels and various device drivers.

□ Computer Science Major Courses

- **Advanced Software Engineering (3)**

An introduction to the techniques for building large, reliable, maintainable, and understandable software systems. Topics include programming paradigms for real systems, systems programming tools, structured design, software testing, and documentation.

- **Machine Learning (3)**

Topics in machine learning, including artificial neural networks, genetic algorithms, support vector machines, Bayesian network, Markov chain are

taught in this course.

- **Advanced Design of Compilers (3)**

Advanced topics in compilation techniques for high level languages. Topics include lexical analysis, grammars, parsing, symbol-table management, type-checking, run-time storage organization, code generation, and optimization. The course involves a substantial project, to develop a compiler for a significant subset of a high-level programming language.

- **Human Computer Interface (3)**

This course provides an overview and introduction to the field of human-computer interaction. It introduces tools, techniques, and sources of information about HCI and provides a systematic approach to design. The course increases awareness of good and bad design through observation of existing technology, and teaches the basic skills of task analysis, and analytic and empirical evaluation methods.

- **Advanced Pattern Recognition (3)**

This course represents an advanced course in pattern recognition. The following topics are covered: statistical pattern recognition (classifiers, optimal classification schemes, feature extraction, learning, applications): syntactic pattern recognition (grammars, grammar inference, applications), neural networks for recognition: non-standard and combined pattern recognition approaches.

- **Advanced Parallel Processing Systems (3)**

Introduction to primitive parallel computing models and programming skills. This course includes small projects those make use of parallel programming libraries, such as MPI, PVM, Linda, Open MP and BSP.

- **Advanced Object Oriented Systems (3)**

An introduction to the principles underlying state-of-the-art object oriented technology. Topics include object-oriented programming language, object-oriented analysis and design, unified process and design patterns issues.

- **Advanced Real Time Systems (3)**

Introduction to basic concept of real time system and applications. Topics include real time kernel, scheduler, and programming model.

- **Advanced Mobile Computing (3)**

The advanced electronic and communication technology invited wireless communication in any handheld component nowadays. Thus, the computing



service can be offered at anywhere and anytime, which is named as mobile computing. In this course, we study basic foundation and its application.

- **Advanced Computer Graphics (3)**

This course provides an introduction of advanced topics in computer graphics. We cover the theoretical background and applications of a selected topic among advanced modeling, real-time rendering and animation, non-photorealistic rendering, and imaging.

- **Advanced Web Information Processing (3)**

This course looks at the methods used to search for and discover information in the Web and Web information systems. Methods that are covered include techniques for searching, browsing and filtering information, classification, clustering, filtering, web mining, the use of classification systems and thesaurus, and Web search systems.

- **Advanced Wireless Internet (3)**

Wireless Internet is one of the key research and development area in computer network. There are several platforms working on wireless phone, based on which we develop wireless application software realizing new concepts in pervasive computing. The course consists of lecture and programming practice.

- **Advanced Information Security (3)**

An introduction to the principles underlying advanced information security technology. Topics include classical encryption techniques, modern encryption techniques, conventional encryption algorithms, confidentiality using conventional encryption, public-key cryptography, message authentication and hash functions, hash and MAC algorithms, digital signatures and authentication protocols, network security and system security issues.

- **Advanced Multimedia Authoring (3)**

An introduction to multimedia authoring in a metadata perspective. We learn how to describe metadata of multimedia contents and related standards such as MPEG-7, MPEG-21, TV-Anytime, SMIL and SCORM.

- **Advanced Media (3)**

An introduction to new digital media and related technologies through their life cycle from creation, delivery and consumption. Topics include audio and video encoding algorithms, metadata description, intellectual properties management and, conditional access system.

- **Advanced Numerical Analysis (3)**

Advanced topics in scientific computation. Topics include differentiation, integration, solution of differential equations, equation solving, minimization/maximization, linear algebra, interpolation.

- **Artificial Intelligence in Education (3)**

This course addresses the use of artificial intelligence and cognitive psychology to build computer-based intelligent tutoring systems. Students will learn empirical and theoretical methods for creating cognitive models of human problem solving. Such models have been used to create educational software that has been demonstrated to dramatically enhance student learning in domains like mathematics and computer programming. This course will have three components: a literature review of some of the fundamental papers in the field; lectures on the needed cognitive psychology and human-computer interaction (HCI) background; and a significant project component in which students will be practicing the use of methods used to design tutors.

- **Advanced Computer Vision (3)**

The course will cover a number of topics ranging from low level to high level vision, with a focus on both the mathematical formulation of vision tasks, and the development and implementation of algorithms to solve them. Lecture topics will include biological vision and early vision, projective geometry and camera modeling, shape from shading and texture, stereo vision, motion analysis and optical flow, object representation and recognition, high level vision and vision applications.

- **Advanced XML (3)**

An introduction to XML and technologies/standards that surround it. Topics include data modeling with XML Schema, XML programming with DOM interface, query processing for XML documents, web services with XML documents. While following the topics, we will learn XML-related standards such as XML Schema, XLink and XPointer, XPath, XQuery, SOAP.

- **Advanced Formal Languages and Automata Theory (3)**

An introduction to the theory of computation. Topics include finite automata, regular languages and regular grammars, properties of regular languages, context-free languages, simplification of context-free grammars, pushdown automata, properties of context-free languages, turning machines. a hierarchy of formal languages and automata and limits of algorithmic computation.

- **Modern Network Analysis (3)**

This course covers the architecture and principles of the modern network (Infrastructure networking, mobile communication, mobile network, social network, etc). It also covers the network structures of wireless lan, ad-hoc network, mesh network, and cellular networks. Furthermore many recent technologies such as medium access protocol, network resource management, mobility and location management, and routing protocols. The students will implement modern network simulation programs by using open source programming, then learn the performance comparison, evaluation, and analysis algorithms.

- **Special Topics in Computer Science (3)**

This course is designed to deal with current topics in computer science outside the regular course offerings. For a given semester, the course content will be announced prior to registration for that semester.

- **Current Issues in Computer Science (3)**

Seminar course discussing readings from current research in computer science. This course is designed to deal with current topics in computer science outside the regular course offerings. For a given semester, the course content will be announced prior to registration for that semester.

- **Advanced Topics in Computer Science (3)**

This course is designed to deal with state-of-the-art topics in computer science outside the regular course offerings. For a given semester the course content will be announced prior to registration for that semester.

- **Selected Topics in Computer Science (3)**

This course is designed to study the topics of computer science not covered in regular course offerings, or directed experience in computer science by means of lecture, discussion, seminar, and research. Recent offerings include advanced databases, computer networks, Java programming, and unix system programming. It is good for the first year graduate students who wish to find research topics in various area.

- **Seminar in Computer Science (3)**

This course is designed to deal with current topics in computer science outside the regular course offerings. For a given semester the course content will be announced prior to registration for that semester.

- **Seminar in Computer Applications (3)**

This course is designed to deal with current topics in applications of computer science outside the regular course offerings. For a given semester, the course content will be announced prior to registration for that semester.

- **Independent Study (3)**

To get a deep study, it is frequently necessary for a student to meet his adviser regularly so as to get the timely and proper guide in the personal meeting. This course exists to meet this kind of needs. It is like a personal tutoring course in the research and development.

- **Case Study in Computer System (3)**

In this course, students survey and study the recent technical trend of computer system architecture ranging from mobile phones and mobile PCs to large computer systems. Selected technical papers are read and presented during the course and each student writes a survey paper for a selected topic on novel computer system architecture.

- **Software Project Management (3)**

In this course, students are trained to follow systematic project management processes in software development. Example software development projects are selected and the whole development processes for the projects are reviewed and revised by course participants.

- **Cyber Infrastructure (3)**

This course is designed to treat the current topics in various issues on Cyber Infrastructure those are including applied Grid computing, e-Science, cluster computing, reliable server management, etc. This course includes seminars and small projects those make use of Globus Toolkit, COG, etc. The contents of seminars will be given in the first lecture.

- **Advanced Computer Network Application (3)**

In this course, special hot issues in the recent research and development of computer network application, e.g., Web 2.0, sensor network, wireless network, etc., are studied extensively. The course contents consist of lectures, paper presentation, demo, and term project.

- **Intelligent Robot (3)**

This course covers intelligent robot research topics related to building and programming mobile and articulated robots to perform simple tasks. It also

covers major paradigms of robot programming and architectures for building perception, control, and learning systems for intelligent robots. These topics will be pursued through independent reading, class discussion, and project implementations. Papers covered will be drawn from robotics, computer vision, animation, machine learning, and neuroscience. Special emphasis will be given to developing autonomous control from human performance.

- **Data Mining (3)**

An introduction to the design of data mining programs. The emphasis is on learning techniques for searching for hidden relationships and patterns in the data, which has been accumulating in many forms, including database systems, spreadsheets, text files, and recently web pages. Topics include machine learning and classification, knowledge representation, decision tree, clustering, visualization, and customer modeling and targeted marketing.

- **Design and Analysis of Algorithms (3)**

An introduction to the design and analysis of algorithms. This course covers a number of ideas and techniques useful for designing and analyzing algorithms. Basic paradigms, e.g., divide and conquer strategies, greedy algorithms, dynamic programming, back-tracking, graph algorithms will be focused. A practical side of algorithm design is also explored with interesting examples of the designing techniques. This course also covers a number of current research topics in this field: problems in communication networks, on-line algorithms, computational geometry, computational biology.

- **Research Ethics & Master Thesis (3)**

This course will provide the graduate students with the writing skill for the master's thesis as well as the research ethics. It will cover the identification of the research problem, problem solving approaches and results, literature survey, and thesis formats. This course will also provide opportunity to become involved in graduate research, under guidance of a supervisor, on a problem of mutual interest to student and supervisor. Regarding the research ethics, the course emphasizes on plagiarism so that the students can follow the research standards.

- **Research Ethics & Ph.D. Thesis (3)**

The purpose of this course is to enable the student to demonstrate the ability to conduct research and write a scholarly dissertation reporting, evaluating, interpreting, and synthesizing results, and to orally defend a completed dissertation before faculty and peers. The purpose of the dissertation is to

produce new knowledge, new materials, or new methods in the student's field of specialization. Furthermore, the student will learn the research ethics. Especially, the course emphasizes on plagiarism so that the students can follow the research standards.

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## Dept. of Architecture

Architecture is both a science and an art. Good architecture is the one that is firmly and functionally built, and must give deep aesthetic experience to those who use it at the same time. The education of architecture, therefore, has dual objectives; the learning of technology to make healthy architecture, and a balanced experience of aesthetic appreciation to provide the students intellectual sensibility. In addition, the significance of architecture as a social art emphasized.

The students in Graduate program study and develop the thesis with greater view towards the society and their own field of research. The program also provides the students the opportunity to experience practical projects.

### ☐ Architectural Design Major

Architectural design is a deep process of developing one's design abilities. Students master architectural design, planning, theory. This course studies various principles and concepts of architecture for a fundamental understanding of it.

### ☐ Architectural Structure Major

Students master concept of building structures concerning a load which act on building and its mechanical movement, and studies force of vector, truss, section, shear moment diagram, stress, strain and application of material.

### ☐ Courses

#### ☐ Core Courses

##### • **Theory of Architectural Style (3)**

The course studies architectural style from European ancient times to modern age.

##### • **Theory of Spatial Composition (3)**

The course studies composition principle of space. The course analyzes relation of architecture and space through actuality work.

##### • **Theory of Urban Planning (3)**

The course analyzes urban development according to connection field. Also, the course studies a whole city that led to social development problem from problem of human essence.

##### • **Research Methodology (3)**



This course studies various principles and concepts of architecture for a fundamental understanding of it. The domain and definition of architecture will be comprehended. The basic knowledge of architecture the process of planning, the basic knowledge of structure, the meaning of architecture and its social role will also be learned.

- **Modern Architectural Theory (3)**

This course studies architecture from the era of Rationalism to the Modern Movement by the various concepts, styles of expression and changes of architectural type and construction. Centering around works and architect, it is learned the arts and crafts movement, the art nouveau, the avant garde, etc. And, studies of history of Korean modern architecture after the nineteenth century are also reviewed.

- **Theory of Contemporary Architecture (3)**

This course studies architecture from the mid 1960s up until now. Various architectural theories including postmodernism and Deconstruction architecture are understood in relation to other arts, literature, philosophy and other cultural factors.

- **Seminar on Korean Architects (3)**

This course studies Korean architect concerned with concept, style, architectural background. In addition, the purpose of this course is to examine the essence of Korean architectural culture.

- **Architecture and Society (3)**

This course studies the interaction between architecture and the physical and social environment based on the interdisciplinary social sciences including sociology, psychology, anthropology, etc. It masters that the way of architectural application for the concepts of a user's need, decision making, social organization and architecture, scientific movement and architectural theory.

- **Research in Architectural Planning (3)**

This course studies design methods and theories of architectural process, analysis and background based on complicity meaning of architecture and urban.

- **Research in Architectural Planning Seminar (3)**

This course studies various principles and concepts of architecture for a

fundamental understanding of it. The domain and definition of architecture will be comprehended. The basic knowledge of architecture the process of planning, the basic knowledge of structure, the meaning of architecture and its social role will also be learned.

- **Theory of Aesthetics (3)**

This course studies logics of architectural theme from ancient to modern aesthetics. Also students practice the architectural critique which uses the concept.

- **History of Oriental Architecture (3)**

History of Oriental Architecture course studies an oriental architecture and regional special formality in a style. Specially, it focuses to make a comparative study how to differentiate Chinese, Japanese and Korean style.

- **Advanced Theory in Computer Aided Design (3)**

This course masters a selection of current hardware and software tools, and provides extensive opportunities to develop practical skills through hands on lab sessions and regular practical exercises. Also students study mechanism, programming, and analysis.

- **Theory of Mechanical Systems for Building (3)**

This course covers principles of construction technology, cost analysis, construction management, and the application to the knowledge to field experience. This study requires full understanding of construction technology and learns how to make a progress schedule. This course also practices the basic of integration and itemized unit cost of progress schedule.

- **Theory of Architectural Acoustics (3)**

This course studies basic architectural acoustics system. Also students master design methods of a theater, studio and concert hall.

- **Structural Systems Analysis (3)**

Students study the structure of response of approximate solution on the statically indeterminate stress of each material, sag analysis, wind load and earthquake load.

- **Theory of Land Use Planning (3)**

The purpose of this course is to study the rational and pertinent use of land. It is researches on the locational conditions of various institutions and the morphological changes of land use. It includes purification method of land use

as well.

- **Theory of Site Planning (3)**

This course is the research of intensive technique in order to arrange sorts of structure and building as human environment on the land.

- **Theory of Landscape Architecture (3)**

The purpose of this course is to solve the dilemmatic problem between the development and the preservation of nature with high technology. It is also to find the possible methodology to solve this dilemma.

- **Theory of Urban Environment (3)**

This course is the lecture about the urban environment design to confront with an urban problem. Its factors are searched at both a cultural view and a physical view.

- **Theory of Interior Design (3)**

This course is the overall discussion of environment design to understand interior design as total design. It is constituted with the design methodology and the presentation for background logic. It also provides how to manage a project from a view of interior architecture.

- **Theory of Interior Aesthetics (3)**

This course is the study on the harmonious process of fitness and empathy which is the background logic in interior design. The logic on each subject and the plan of the practical environment are required for its realization.

- **Research in Contemporary Architects (3)**

The purpose of this course is analyzing the international tendency and understanding each logics through focusing on the architects working since modernism.

- **Critique of Contemporary Architecture (3)**

This course is constituted by study on the tendency of contemporary architecture and theorizing current thoughts on each of them from the general view. The main discussible subjects are focused on the circumstances that progress from modern architecture to post modern architecture. It is based on the analysis of ideas of architects and their works.

- **Advanced Architectural Design I (3)**

Advanced Architecture Design I course study theory of background, method of development and analysis that is stood architectural solution on a complex characteristic of architecture and urban fabric.

- **Advanced Architectural DesignII (3)**

Advanced Architectural Design II course study analysis, development and ultimate principle after institute a cooperation theme, as a architectural design process about social contribution of architecture.

- **Advanced Architectural DesignIII (3)**

Advanced Architectural Design III course that is started from social cultural analysis about solving a ultimate human environment study a way for embodying to architectural environment with theme creation on the part of freedom subject.

- **Theory of Structural Systems (3)**

Theory of Structural Systems course studies mechanical movement and building system of Core, Shear Wall, Wall Bracing, Tube System, etc. for solution of a horizontal force in buildings.

- **Research and Special Thesis of Architectural Design (3)**

Research and Special Thesis of Architectural Design course study necessity of subject, process of development, collecting and analysis of data, materialization of logic and essay type techniques that is stand established each subject before write a thesis for a degree.

- **Research in Architectural Design (3)**

Research in Architectural Design course studies logical practice and method of analysis that is used by existing architects for an ultimate solution as a process through a study of architectural design.

- **Research in Architectural Design Seminar (3)**

Research in Architecture Design Seminar course study to make a report about a architectural model that include social valuation, economic valuation, and environmental valuation in order to analyze architectural theme and those results with positive.

- **Research in Architectural Form (3)**

Research in Architectural Form course studies an architectural aesthetics theory.

- **Research in Architectural Environment (3)**

Research in Architecture Environment course studies culture, society, psychology, physical the surrounding[social] environment as all things considered background that is formed architecture and research a methodology to be adjusted such a subject.

- **Research in History of Oriental Architecture (3)**

Research in History of Oriental Architecture course studies oriental architecture and regional special formality in a style. Specially, it focuses to make a comparative study how to differentiate Chinese, Japanese and Korean style.

- **Research in History of Western Architecture (3)**

This course covers the substance of western architecture focusing on concept of history. Student will understand sociality, technique and regional differences as an important decision factor of the style.

- **Research in History of Korean Architecture (3)**

This course explores the history of korean architectural design, theory and practice. In collusion with the Far East Architecture, this course studies korean classic building's place in style of architecture. After lessons, detail of each style are explained.

- Architectural Structure Major Courses

- **Research in Architectural System I (3)**

The focus of this course is the understanding for the organic relations of architectural system that is made by architectural structure, construction/materials, architectural environment/equipment and urban planning.

- **Research in Architectural System II (3)**

This lecture provides the recent trend of architectural structure, construction/materials, architectural environment/equipment and urban planning. This course also reviews the developmental direction of architectural system through the consideration of future building or a recent trend of architectural technology.

- **Theory of Steel Structure (3)**

The methodology and consideration of the structure of steel are discussed. Studies of specification and junction planning are reviewed.

- **Theory of Advanced Structure (3)**

This course examines structural analysis on mechanics plan of frame, stress basic principle for frame's motion and the principles and thinking process by which the analysis reaches decisions intended to resolve modification.

- **Finite Element Analysis (3)**

This course studies finite element method for solving structure, two dimensional rigid plate, shell and three dimensional rigid plate in architectural engineering.

- **Dynamics (3)**

This course studies particle using classical mechanics by Sir Isaac newton, geostatics, kinetic mechanics, energy and momentum. And the course introduces the oscillation theory and the equation of motion.

- **Special Research Thesis of Architectural Structure (3)**

Study unfolding method, data collection method, own logic organization, synthetic statement techniques on each subject that is established before thesis creation.

- **Theory of Architectural Environment (3)**

This course focuses on the background of thermal transfer processes in buildings through studies of heat transfer, air flow, thermal comfort, and load calculation algorithms. This lecture also provides the basic knowledge and skills required by architectural engineering students who lack sufficient knowledge of fluid mechanics and CFD.

- **Theory of Indoor Air Quality (3)**

This class explores estimation methods of indoor air quality by investigation of national and international standards. Different types of ventilation systems are examined to study the methodologies used in resolving IAQ problems. CFD analysis and the capability to create new data from the results of CFD are both important. This class is aimed at acquisition of fundamental knowledge and skills through CFD exercises.

- **Simulation for Building Performance (3)**

The focus of this course is the application of simulation techniques in building design. The course uses computers and various other simulation tools for design performance prediction and/or evaluation. These simulation tools are used to promote an understanding of the fundamental principles involved in assessing the built environment and creating new applications for simulation techniques.

- **Research in Matrix Structure Analysis (3)**

This studies structural analysis of Matrix Structure Analysis and Matrix analysis of Digital Computer.

• **Research in Architecture Structures (3)**

The course introduces various method of structural analysis. Topics includes slope deflection method, the moment distribution, principle of hypothesis work, energy method and influence line method as solving truss, arch and frame.

• **Research in Steel Structure (3)**

This studies qualities of the enforced material, explosion , design concept of the steel structure. Also it studies steel structure for earthquake.

• **Research in Reinforced Concrete (3)**

This studies about the beam, pillar, slab, foundation relating strengthen design methodology

• **Research in Elastic-Plastic Theory (3)**

Study stress, displacement theory, state of elastic equilibrium, distortion of prismatic members, wus, stress concentration, plate and shell.

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## Dept. of Ceramics

In core courses(co-requisite), students will study East Asian and European ceramic histories and the philosophical foundations of the culture makers. In major courses(required courses), students will focus on ceramic works by themes, materials, and techniques through researches, presentations, and seminars. These courses also help students to formulate basic ideas for their theses.

### ☐ Courses

#### ☐ Core Courses

##### • **Seminar for Craft Theory (3)**

This course, consisting of a series of lectures and seminars, provides students with theoretical knowledge that will become a basis for their craft manufacturing. Through the course, students will acquire the skills of analytical thinking, describing, discussing and presentations on their chosen subjects. Students will also develop the skills of objective analysis and critical evaluation of craft works.

##### • **History of Ceramics (3)**

Students will survey the development of Korean ceramics and its historical background. A comparative analysis of East Asian and European ceramic history will be followed.

##### • **Research ethics and essay study (3)**

We guide about essay study separately such as selecting course of research topic, deduction of right result and essay composition and presentation.

We ponder and discuss about various ethical situation that can be confronted during executing work research in advance in order to be prepared.

Moreover, we let students study problem solving method related to research ethics by centering cases as well as let students to understand the purpose for making ethical judgment and its importance.

#### ☐ Ceramic Craft Major Courses

##### • **Studies on Ceramic Craft 1 (3)**

This course is a blend of studio practices, discussions and lectures that focus on chosen topics in relation to ceramic manufacturing. Students will cultivate their techniques with the analysis and critical evaluation of ceramic works.

- **Studies On Ceramic Sculpture 1 (3)**

Students will study the concept and development of ceramic sculptures. In addition, through studio practices, students will explore a wide range of possibilities of creative expressions in ceramic sculptures.

- **Studies on Ceramic Craft 2 (3)**

Students will develop technical mastery of ceramic sculptures and critical assessment of ceramic works through a series of studio practices, discussions and presentations related with the themes of ceramic craft.

- **Studies on Ceramic Sculpture 2 (3)**

This course will help students to expand technical mastery of ceramic sculptures and critical assessment of ceramic works through the studio practices, discussions and presentations related with the themes of ceramic craft.

- **UIT Ceramic Materials 1 (3)**

In this course, students will conduct a series of analyses and experiments of ceramic materials to solve technical problems in the process of fabricating ceramic works in general. New types of materials will also be explored.

- **UIT Ceramic Materials 2 (3)**

As an in-depth course of UIT ceramic materials 1, the main purpose of this course is to explore new materials and conduct further experiments of ceramic crafts.

- **Studies On traditional Ceramics (3)**

Students will make a comparative study of the developments and characteristics of our glorious old pottery culture and manufacturing techniques.

Through this study, the future prospect of Korean ceramic craft will be presented, students identifying the coordinate of Korean ceramic craft.

- **Studies on Contemporary Ceramics (3)**

The course examines the trends and theories related with contemporary ceramic crafts. Students will grasp, analyze and research the trends of contemporary ceramics.

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## Dept. of Metalwork and Jewelry

As a medium of artistic expression as well as a branch of design, craft is especially emphasized in modern society, because it can bridge the human spirit with the material world. The graduate program in Metalwork and Jewelry has been produced distinctive, professional craft people in the field of contemporary metalwork and jewelry. The program acknowledges and celebrates the history of Korean metal craft culture as well as the diverse scope of international contemporary craft scene. The curriculum supports professional investigation of jewelry, hollowware, metal sculpture, object making and metal product design. With high quality of facility, internationally recognized faculty members, various scholarships and the exchange student program, the graduate program in Metalwork and Jewelry provides one of the highest quality educations in the world.

The graduate program in Metalwork and Jewelry encourages and supports students with their development in aesthetic and conceptual development, technical experimentation and personal expression. Through conversation and mutual exchange within the department, students are enabled to refine and extend their individual artistic directions in their consideration with career goals. The metal studio functions as an ideal space for nurturing new possibilities of making and ways of expanding the boundaries of the field.

### ☐ Courses

- **Seminar for Craft Theory (3)**

An examination of basic concepts necessary for understanding the craft work. The lecture is paralleled with seminar to provide philosophic base, analytic thinking and criticism for studio project through readings, writings, discussions and presentations.

- **Crafts Marketing (3)**

Specialized course study in distribution and management of craft work. Offering essential marketing strategy and basic business management for future professional craft artists.

- **Theory for Metal Crafts (3)**

Investigation of the history of metal craft and diverse phenomena in contemporary metal art. Students will explore essential meaning of metal work and its application in contemporary society.

- **Metalwork & Jewelry 1 (3)**

Students are given some short-term assignments that are done as a group to

explore specific ideas and to reveal various approaches to a theme. Includes group projects, presentations and critiques.

- **Research on Technique and Material 1 (3)**

Through the experimentation with various materials and applied techniques historically used in metal field, this class emphasis on understanding of material, method, and process and possible application in contemporary work. Students will learn diverse range of methods of achieving meaning in an metalwork.

- **Metalwork & Jewelry 2 (3)**

Individually directed project. This class focuses on individual development of conceptual and aesthetic interests. Students are expected to research on topics, specific materials and techniques. The study also includes discussion and critique based upon individually directed project.

- **Research on Technique and Material 2 (3)**

Continuation of Research on Technique and Material 1.

- **Metalwork & Jewelry 3 (3)**

Individually directed project. This class focuses on individual development of conceptual and aesthetic interests. This class will be a comprehensive research on topics, specific materials and techniques and provide a base for the thesis project. Also includes discussion, presentation and critique of final project.

- **Study for Digital Technology (3)**

General understanding of computer softwares. CAD/CAM operation is the center of this study. Students will acquire skills to explore the possibilities in reproduction of work. This study also includes practical information on computer softwares applicable for individual data management.

- **Study for Industrial Application (3)**

Research for methods in mass production in craft. Research includes modeling process, mass production systems, market researches, examples of industrial application.

- **Research Ethics and Thesis Study (3)**

Students are expected to set up their personal projects and produce a series of work. They are responsible for the completion of their work as well as a study of materials and techniques for their thesis.

· **Independent Study I (3)**

Student studies out a new subject for seminar and researches related assignment.

· **Independent Study II (3)**

Student needs to find a primary concern and to research a individually selected subject for thesis.

☐ **Faculty Members**

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## Dept. of Communication Design

### **Program Outline**

MFA Communication Design is built for researching the proper way of communication through various contemporary media. With the research, students and faculty are to propose advanced discourse in design field. By breaking the boundaries made by the old media-centered design method, we aim to research communication design as a integrated human behavior to reorganize the society. Individual students stay close to their peer as well as faculty, so that, the entire members are always well-advised and focused.

### **Curriculum**

In this two year program the studio performs seminar, workshop, self-initiated projects to develop both theory and practice. At the end of the program, students are to accomplish their research and it results as a thesis. The first year curriculum is composed of Communication Design Seminar, Communication Design Theory, Graphic Studio. The second year curriculum is focused on individual study to build thesis. We accept only 4.6 qualified students each year to keep the program size small for an in-depth study. Usually the applicants has graphic design background, however, it is wide open to the non-design based applicants. We open the practice-based undergraduate courses for the students who are lack of basic design knowledge and skill.

### **□ Courses**

#### **• Communication Seminar 1 (3)**

This course focuses on cultivate an comprehension of the the surrounding environments, realizing connections between elements and find the new context out of them.

#### **• Communication Seminar 2 (3)**

The goal of this course is developing one's ability to understand and express the relationship between image, language, idea and symbols. Students are encouraged to explore various methods such as, image research, keyword mapping, collage, contextual typography, and so on. Throughout this studies, students understand the layered relationship of semantic elements and articulate it in original expression method.

#### **• Communication Design Theory 1 (3)**

The curriculum look into the 20th century graphic design history to understand the concepts of the European Avant-garde movement, graphic design Modernism, American corporation identity and the ideas of their advocates to understand the origin of graphic design as a profession as well as cultural research area.

- **Communication Design Theory 2 (3)**

Starting from the confrontation of two camps of late 20th century design society: Modernism and Postmodernism, students conduct research about controversial issues as two opposite ideas: authorship and anonymity; localization and globalization; new technology and traditional value.

- **Research Ethics & Thesis Study 1 (3)**

This course focuses on improving students' knowledge about their thesis theme, as well as studying a thesis writing process.

- **Research Ethics & Thesis Study 2 (3)**

This course focuses on improving students' knowledge about their thesis theme, as well as studying a thesis writing process.

- **Graphic Studio 1 (3)**

This course studies the basic principles and methodologies of graphic design while practicing functional capabilities of graphic such as typography, information design, visual semantic composition.

- **Graphic Studio 2 (3)**

This course studies the basic principles and methodologies of graphic design while practicing functional capabilities of graphic such as typography, information design, visual semantic composition.

- **Motion Studio 1 (3)**

Understand the history, theory, criticism and technology of diverse media, such as, film, television, internet, mobile media, and apply the ideas to one's own communication method. The curriculum is to proceed based on studio practice. Various media technologies are introduced including Live Action, Motion Graphics.

- **Motion Studio 2 (3)**

Understand the history, theory, criticism and technology of diverse media, such as, film, television, internet, mobile media, and apply the ideas to one's own communication method. The curriculum is to proceed based on studio practice. Various media technologies are introduced including Live Action, Motion Graphics.

- **Media Studio 1 (3)**



Starting from the introduction of the history of digital media, this course look at the application of digital media in design, art and architecture field. The study results in observing the form of the future of digital media. For this, students are to participate basic workshop to learn basic digital graphic skill.

• **Media Studio 2 (3)**

Starting from the introduction of the history of digital media, this course look at the application of digital media in design, art and architecture field. The study results in observing the form of the future of digital media. For this, students are to participate basic workshop to learn basic digital graphic skill.

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## **Dept. of Space Design**

### **□ Space Design Major**

In the future society, respect for humans and value of life will be highly regarded along with pursuit of fine living culture. So, we aim at study and education of beauty, function and technology as the creative value to create a new space culture. Also, we have understanding of new space concept suitable for the digital age and educational value suitable for a space paradigm of the ubiquitous situation. For this, the Department of Space Design runs subjects to have the comprehensive ability as a designer on the basis of theory and practice.

Space Design Major of Graduate School of Arts and Sciences aims to cultivate professional manpower for design education to propose the methodology and criticism, seeking for a new space not only in the existing physical side, but also expanding even to the humanistic realm and cyberspace, through investigation into space, environment, relationship with people and identity, based on the research of the sociocultural phenomenon and the new paradigm. That is to say, we produce high-quality human resources of academic field with both theoretical basis and realistic sense of design and promote development of design education.

### **□ Courses**

#### **· Theory of Space Design Planning (3)**

As a fundamental course for realistic space design, this brings up the ability to visually express space and themes; themes and functions; and space and aesthetics, and cultivates the ability to compose technical problems of planning a space and contents contained in a space.

#### **· Theory of Housing Space Planning (3)**

This teaches a theory on how to design a residential space, finds out problems depending on kinds of residences, and cultivates the ability to design a new residential space through a design approach to solve a problem.

- **Theory of Display Design Planning (3)**

This cultivates the ability to complete an exhibition space through exhibition space, environmental factors, production media and space design by establishing the concept of exhibition and shaping the meaning and theme of exhibitions for effective communication with spectators.

- **Theory of Public Design Planning (3)**

This cultivates the ability to establish a conception of public space distinguished from personal space and to reasonably design a physical function as a facility and a public space as a visual environmental factor in a human community.

- **Studies in space design (3)**

This enables deep researches on how to interpret space and design and express and produce a space through diverse materials and specialized spaces.

- **Ubiquitous Design (3)**

This cultivates the ability to perform, produce, plan and develop design by introducing a ubiquitous conception.

- **Theory of Korean Interior Space (3)**

This cultivates the creative insight to learn the sculptural principle of traditional space through an indoor space created in our country's nature and history and see into the present and the future.

- **Lighting Design (3)**

This cultivates the ability to research the design meaning of the lighting playing an important role in indoor space as a tool or light element and maximize the image of a space through spatial production by lighting.

- **Space and Aesthetics (3)**

This researches new phenomena of a space their meanings affecting the space in a aesthetic point of view through an approach of discussions based on the technology in a digital era as well as the aesthetics in a traditional concept.

- **Space Cordination and Research Of Trend (3)**

This cultivates the ability to express a specialized space through diverse approaches to the interpretation and production technique between spaces and trends.

- **Art Theories in Modern Space (3)**

This enables one to learn general theory and establish new space concepts based on the basic understanding of contemporary sculptural concepts and thoughts.

- **Research Seminars (3)**

This enables one to have a time to research and discuss the latest design issues in space design's point of view. This enables one to research the way to academically access design through objective verification via this discussion.

- **Furniture and Space Design (3)**

This cultivates the ability to understand the basic elements of furniture design and the function and role of furniture design in indoor space design and perform creative design through material and structural experiments.

- **Thesis research (3)**

This enables one to deeply academically research personal subjects. Things are carried out by using different methodology depending on the scope, purpose, direction, etc. of research contents starting from the step to set a subject.

- **Theory of Space Marketing (3)**

This researches the design methodology to provide customers with experience values through the spatial configuration and planning containing brand values.

- **Theory of Space Identity (3)**

This cultivates the ability to integrate the images of a space in a spatial dimension as well as in a visual dimension.

- **Theory of Space Practice (3)**

This cultivates the ability to prepare detailed drawings for construction after basic design so that a spatial plan may be practically realized and the ability to apply the completed design through practical work theory and site study.

- **Theory of Modern Design (3)**

This cultivates the ability to view the design phenomena after postmodernism based on the historical context after the modern times among the historical flows of design and grasp the sculptural principle and source of design in the same times.

- **Space and Culture (3)**

Changes in the future space are inferred by taking a look at the spatial changes depending on the social changes of the times and the transition process of space depending on the historical flow and by grasping the connectivity between space and culture.

### · History of Space Design (3)

As an acting main body, the human beings have been living an independent and coexisting life in nature differently from time to time through space. This cultivates the ability to grasp the context of indoor design from the ancient times to the modern and contemporary times.

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## Dept. of Entertainment & Contents Design

The department of Entertainment & Contents Design, newly opened in 2014 is a challenging vision for future design which 40 years of the history in design education of Kookmin University presents. In today's circumstance that the value and importance of entertainment industry are emphasized, Korean culture already possesses the rich tradition of highly-valued entertainment spirit, pung-ryu(風流). The Entertainment & Contents Design is achieving advanced communication for human being by endowing futuristic convergence of design and technology to the historic heritage. The broad range of education on entertainment contents industry such as VFX-visual special effects, 3d animation, motion graphics, commercial films, etc and new form entertainment fields amalgamating art, design and it is provided in systematic and professional methodology. Ultimately the department of Entertainment & Contents Design is contributing to creation of high-class global entertainment culture with conceptual design education paradigm of convergence subsuming conventional medium-centered education methodology.

### ☐ Courses

#### • **Intensive Production Studio 1, 2 (3)**

The ultimate goal of the Intensive Production Studio 1 and 2 is exploring and developing the methodology for creative production on various forms of motion pictures such as narrative film, documentary, video art, virtual game, motion graphics, interactive media and so forth.

#### • **History Study of Motion Pictures and Media (3)**

The ultimate goal of the History Study of Motion Pictures and Media is researching the history of motion pictures and media from early film, broadcasting to new media for cultural consideration on the entertainment industry in contemporary society.

#### • **Critical Study of Motion Pictures and Media (3)**

The ultimate goal of the Critical Study of Motion Pictures and Media is cultivation of upright viewpoint for creation of motion contents with philosophical, aesthetic and cultural perspective.

#### • **Integrated Design Study (3)**

The ultimate goal of the Integrated Design Study is developing the methodology of broadening the perspective of design with exploring and integrating various fields such as ideology, culture and technology on

multi-dimensional perspectives.

- **Contents Design Study (3)**

The ultimate goal of the Contents Design Study is developing the methodology of broadening the perspective of design with exploring and integrating various fields such as ideology, culture and technology on multi-dimensional perspectives.

- **Research Ethics & Thesis Study (3)**

The ultimate goal of the Research Ethics & Thesis Study is cultivating ethics in researching and studying.

- **Thesis Study Seminar (3)**

The ultimate goal of the Thesis Study Seminar is solidification the foundation and theorization of personal viewpoint for thesis project.

- **Advanced Story Design 1, 2 (3)**

The ultimate goal of the Advanced Story Design is developing story and narrative technic for various forms of motion media from film, animation, commercial film to virtual game.

- **Advanced Digital Video (3)**

The ultimate goal of the Advanced Digital Video is acquiring of theories and technic on utilizing professional video equipments for creative production.

- **Advanced Sound Design (3)**

The ultimate goal of the Advanced Sound Design is acquiring of theories and technic on utilizing professional sound softwares such as ProTools and hardwares for creative production.

- **Advanced Motion Design 1, 2 (3)**

The ultimate goal of the Advanced Motion Design is acquiring of theories and technic on motion design for various spectrum of media such as motion graphics, VFX, 3D animation needed for cinema, broadcasting and the other forms of motion media.

- **Advanced Media Design 1, 2 (3)**

The ultimate goal of the Advanced Media Design is exploring the new possibility of interactive media for entertainment industry.



## · Study Seminar (6)

The ultimate goal of the Thesis Study Seminar is solidification the foundation and theorization of personal viewpoint for thesis project.

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## **Dept. of Music**

The Department of Music offers a wide range of courses to help students improve their abilities in creating, interpreting, and performing music. The curriculum focuses on developing performance skills and broadening knowledge in related fields. Students have ample opportunities for public performance on and off campus during their academic years. In addition, students are encouraged to cultivate their intellectual curiosity and interest in every aspect of music.

### **☐Voice Major**

The Voice major offers private lessons for students to develop their vocal talent. The major seeks to produce accomplished vocalists who will be successful in their professional pursuits as performers and vocal instructors.

### **☐Piano Performance Major**

The Piano major requires the ability to interpret and analyze new music repertoire, theory, and literature based on the undergraduate study. Students are trained to become professional musicians and educators. In order to successfully meet this goal, students engage in a variety of course work, develop musical skills through individual piano lessons, and participate in domestic and international master classes and seminars.

### **☐Orchestral Instruments Major**

The Instrumental major prepares students to develop into excellent and professional players who can contribute new ideas to the contemporary musical environment. The major offers effective and practical course programs. In addition to providing opportunities for students to participate in chamber ensembles and individual lessons, students partake in internationally acclaimed master classes, concerts, and seminars.

### **☐Composition Major**

The major in Composition is designed to enhance the ability to create music that can offer a new perspective in music history. Students are exposed to a wide range of musical trends and learn to adapt to new musical environments through actual performance and concrete practice.

## ❑ Collaborative Major

The collaborative piano major will train in key techniques and musical knowledge in the main repertory to become a professional accompanist. They will utilize and have an understanding of the essential repertoire for the professional accompanist. They conduct exchanges with other universities for the ever expanding chamber music study. They do this in order to contribute to the development of the whole culture of arts, and to understand and learn the educational components required for professional music leaders.

## ❑ Courses

### ❑ Core Courses

#### • **Seminar on Contemporary Music (3)**

This semina enhances the understanding of diverse styles of contemporary music.

#### • **Analysis of Musical Form and Style (3)**

This course enables students to understand and develop skills in analyzing various forms of tonal music. Students will primarily study the literature and form of western music. The objective of the course is to encourage students to better understand the music they play as well as gain a new appreciation for the form and function of music.

#### • **Advanced Music Theory (3)**

In order to understand advanced contemporary repertories, students will learn both basic and advanced theory as well as the melodic and harmonic structures of early twentieth century music. The course consists of analysis and practice of general atonal and twelve-tone music from historically prominent musical literature.

#### • **Research Ethics & Thesis Study (3)**

Students learn to analyze and evaluate valuable theses while learning the proper process. During the course, students are able to prepare their thesis and will learn how to effectively collect information by researching a variety of primary and secondary sources. finally, the will understand the nature and definition of research ethics and an appreciation of rhe importance of good research.

#### • **Studies of Romanticism (3)**

This course explores the differences in style and evolution of romantic music. Comparisons and analysis of music from other eras are a major theme in the

course. Students will examine the basic concept of romanticism and its philosophy.

- **Advanced History of Music (3)**

Advanced Music History is intended for those who wish to expand their knowledge of historical styles, genres, composers, periods, music literature, and analytical techniques, researching five periods; Renaissance, Baroque, Classic, Romantic, and Twentieth Century. The program is especially recommended for those who want to pursue a master and doctoral degree in musicology. The Advanced Music History emphasizes a historic and analytical approach to the study of music and the development of scholarly research skills.

- **Independent Study I (3)**

Independent study is a course of study that a student pursues independently. This course provides students an opportunity to pursue a research topic of their interest and to go beyond regular courses.

- **Independent Study II (3)**

Independent study is a course of study that a student pursues independently. This course provides students an opportunity to pursue a research topic of their interest and to go beyond regular courses.

- **Independent Study III (3)**

Independent study is a course of study that a student pursues independently. This course provides students an opportunity to pursue a research topic of their interest and to go beyond regular courses.

❑ **Composition Major Courses**

- **Studies of Serial Music (3)**

This course focuses on the study of the Second Viennese School writing style that has been called 'twelve-tone technique'. Serialism can be regarded as one of the great compositional techniques in western music history. Instructors may require students to analyze serial music and apply it to their individual work to further practice the technique.

- **Studies on Experimental Music (3)**

Students research prominent experimental works and study the characteristics and philosophy of the chosen repertoires. Students will discuss the fundamental nature and content of experimental music in the twentieth century.

- **Seminar in Composition (3)**

Students participating in this seminar discuss recent topics and relevant issues in Composition. The course requires a detailed study of prominent composers and their works so that students can apply various techniques and styles to their own music. Students will work closely with their instructor to evaluate the process and development of their musical style.

- **Advanced Orchestration (3)**

This course is designed to teach advanced orchestration techniques and composition of chamber music. The course will allow students to practice various instrumental techniques and experiment with small ensemble orchestration. Students will concentrate on technical aspects such as voicing, texturing, and styling.

- **The Twentieth Century Music (3)**

The course provides an in-depth study of serialism, concrete music, electronic music, and aleatory music. Students will research in detail the various forms of music throughout the twentieth century. Students will also have the opportunity to coordinate workshops and presentations.

- **Independent Study I (Composition) (2)**

Independent study courses provide a special opportunity for graduate students to work in a highly individualized setting with one or more faculty members. All such study must receive the approval of the faculty member providing the instruction, the students' major advisor. Approval of independent study projects will be granted only for students whose academic and musical record provides substantial support for the benefits of this type of study.

- **Independent StudyII (Composition) (3)**

Independent study courses provide a special opportunity for graduate students to work in a highly individualized setting with one or more faculty members. All such study must receive the approval of the faculty member providing the instruction, the students' major advisor. Approval of independent study projects will be granted only for students whose academic and musical record provides substantial support for the benefits of this type of study.

- **Major in Composition for Master 1 (2)**

This course is designed to foster the development of high level professional composers. Students will take individual lessons every week and will compose

for a variety of groups - trio, quartet, quintet, chamber ensemble, and orchestra.

- **Major in Composition for Master 2 (2)**

This course is designed to foster the development of high level professional composers. Students will take individual lessons every week and will compose for a variety of groups - trio, quartet, quintet, chamber ensemble, and orchestra.

- **Major in Composition for Master 3 (2)**

This course is designed to foster the development of high level professional composers. Students will take individual lessons every week and will compose for a variety of groups - trio, quartet, quintet, chamber ensemble, and orchestra.

- **Major in Composition for Doctor 1 (2)**

This course is designed to foster the development of high level professional composers. Students will take individual lessons every week and will compose for a variety of groups - trio, quartet, quintet, chamber ensemble, and orchestra.

- **Major in Composition for Doctor 2 (2)**

This course is designed to foster the development of high level professional composers. Students will take individual lessons every week and will compose for a variety of groups - trio, quartet, quintet, chamber ensemble, and orchestra.

- **Major in Composition for Doctor 3 (2)**

This course is designed to foster the development of high level professional composers. Students will take individual lessons every week and will compose for a variety of groups - trio, quartet, quintet, chamber ensemble, and orchestra.

- **Major in Composition for Doctor 4 (2)**

This course is designed to foster the development of high level professional composers. Students will take individual lessons every week and will compose for a variety of groups - trio, quartet, quintet, chamber ensemble, and orchestra.

- **Major in Composition for Doctor 5 (2)**

This course is designed to foster the development of high level professional

composers. Students will take individual lessons every week and will compose for a variety of groups - trio, quartet, quintet, chamber ensemble, and orchestra.

□ Voice Major Courses

• **Opera Workshop I (3)**

Students learn to practice every aspect of maturing into an established opera singer through the scene program. Students participate in research and analysis of general opera repertoires that range from classic to contemporary approaches.

• **Opera Workshop II (3)**

Students learn to practice every aspect of maturing into an established opera singer through the scene program. Students participate in research and analysis of general opera repertoires that range from classic to contemporary approaches.

• **History of Opera (3)**

This course is a consideration study on flows of European operas (Italy, Germany, and France) in aspects of humanities and cultural anthropology.

• **Choir Conducting (3)**

This course explores theoretical and practical approaches to conducting. Students learn basic choral conducting techniques and examine various choral genres. Students also develop their rehearsal technique and score reading through small choral ensembles.

• **Seminar on Vocal Music (3)**

This course intensively do the comparative study on art songs and operas of Russia, Spain, the Czech Republic, and others.

• **Voice Literature (3)**

This course is a detailed study on art songs of Italy, Germany, France and English based on periods and composer.

• **Repertoire Coach (3)**

Special topics of Cantata, Oratorio, Art Song, Opera and other vocal genres. Focus on each Era of music history, background of literature, poetry and music settings. Designed primarily for master's degree students.

• **Seminar on Oratorio (3)**

Designed to provide a basic understanding of how to sing Oratorios.

Study on history and musical background of Oratorio also analysis of its style, general ideas, cultural context, and performance practice.

• **An analytical Methods of Vocal Works (3)**

Dealing mainly with cantata, Oratorio, Art Songs, and Opera: analysis of masterpieces of music with reference to cultural background of composer, poet, and librettist. Designed for master's degree students.

• **Major in Voice for Master 1 (2)**

These courses aim to develop the student's vocal technique through individual lessons. Students have the opportunity to encounter a diverse vocal repertoire, including fine art songs and opera arias.

• **Major in Voice for Master 2 (2)**

These courses aim to develop the student's vocal technique through individual lessons. Students have the opportunity to encounter a diverse vocal repertoire, including fine art songs and opera arias.

• **Major in Voice for Master 3 (2)**

These courses aim to develop the student's vocal technique through individual lessons. Students have the opportunity to encounter a diverse vocal repertoire, including fine art songs and opera arias.

• **Major in Voice for Doctor 1 (2)**

These courses aim to develop the student's vocal technique through individual lessons. Students have the opportunity to encounter a diverse vocal repertoire, including fine art songs and opera arias.

• **Major in Voice for Doctor 2 (2)**

These courses aim to develop the student's vocal technique through individual lessons. Students have the opportunity to encounter a diverse vocal repertoire, including fine art songs and opera arias.

• **Major in Voice for Doctor 3 (2)**

These courses aim to develop the student's vocal technique through individual



lessons. Students have the opportunity to encounter a diverse vocal repertoire, including fine art songs and opera arias.

- **Major in Voice for Doctor 4 (2)**

These courses aim to develop the student's vocal technique through individual lessons. Students have the opportunity to encounter a diverse vocal repertoire, including fine art songs and opera arias.

- **Major in Voice for Doctor 5 (2)**

These courses aim to develop the student's vocal technique through individual lessons. Students have the opportunity to encounter a diverse vocal repertoire, including fine art songs and opera arias.

- ❑ **Piano Performance Major Courses**

- **Piano Literature I (3)**

Student in this course will study and analyze prominent repertoires from every period of music history. In addition to comparing various aspects of performing techniques, the course requires students to research repertoires from Baroque, Classic, Romantic, and Contemporary music to gain a solid foundation of the characteristics of each period.

- **Piano Literature II (3)**

Student in this course will study and analyze prominent repertoires from every period of music history. In addition to comparing various aspects of performing techniques, the course requires students to research repertoires from Baroque, Classic, Romantic, and Contemporary music to gain a solid foundation of the characteristics of each period.

- **Seminar on Piano I (3)**

This course highlights relevant topics and issues that have recently emerged in piano music in order to better understand this instrument. The course consists of researching special issues and engaging in discussions through a critical and logical approach.

- **Seminar on Piano II (3)**

This course highlights relevant topics and issues that have recently emerged in piano music in order to better understand this instrument. The course consists of researching special issues and engaging in discussions through a critical and

logical approach.

- **Seminar on Piano III (3)**

This course highlights relevant topics and issues that have recently emerged in piano music in order to better understand this instrument. The course consists of researching special issues and engaging in discussions through a critical and logical approach.

- **Studies on specific composer of Classic - period (3)**

In this course, students study and analyze the classical composers and their piano repertoires. Students participate in selective studies of critical classical piano music and give lectures on how to interpret and perform properly.

- **Studies on Specific Composer of Romantic-period (3)**

In this course, students study and analyze the romantic composers and their piano repertoires. Students participate in selective studies of critical romantic piano music and give lectures on how to interpret and perform properly.

- **Studies on specific composer of Contemporary - period (3)**

In this course, students study and analyze the contemporary composers and their piano repertoires. Students participate in selective studies of critical contemporary piano music and give lectures on how to interpret and perform properly.

- **Performance Practice in Baroque and Classic Period (3)**

This course is dedicated to the study and research of the Baroque and Classical performing technique and the distinct styles of each time period.

- **Piano Ensemble I (3)**

This course allows students to undertake the study of many kinds of piano repertoires from the Baroque to the modern period. The course consists of researching each time period's piano ensemble repertoires and studying performing technique with various other instruments. The goal for the course is to understand basic concepts of the piano ensemble and to develop performance skills in class.

- **Piano Ensemble II (3)**

This course allows students to undertake the study of many kinds of piano repertoires from the Baroque to the modern period. The course consists of researching each time period's piano ensemble repertoires and studying performing technique with various other instruments. The goal for the course is

to understand basic concepts of the piano ensemble and to develop performance skills in class.

- **Major in Piano for Master 1 (2)**

This course is designed to help students develop piano techniques as highly skilled professional players. Students take individual lessons with various piano repertoires that cover a diverse piano genre, including solo and ensemble pieces. This course provides valuable opportunities to develop students' techniques in both practical and theoretical realms so that they can grow into accomplished musicians.

- **Major in Piano for Master 2 (2)**

This course is designed to help students develop piano techniques as highly skilled professional players. Students take individual lessons with various piano repertoires that cover a diverse piano genre, including solo and ensemble pieces. This course provides valuable opportunities to develop students' techniques in both practical and theoretical realms so that they can grow into accomplished musicians.

- **Major in Piano for Master 3 (2)**

This course is designed to help students develop piano techniques as highly skilled professional players. Students take individual lessons with various piano repertoires that cover a diverse piano genre, including solo and ensemble pieces. This course provides valuable opportunities to develop students' techniques in both practical and theoretical realms so that they can grow into accomplished musicians.

- **An Analytical methods of piano works (3)**

This course looks into performance than existing theoretical analytics. We will take a comprehensive approach to theoretical background of a selection of piano music, requested to perform, while performing and analyzing the pieces. Through analysis of these findings, combined with sound itself, we detect changes in performance. Our goal is to habituate every individual to the aforementioned process to acquire analytical capability, applicable to all kinds of performance to take place henceforward.

- **Major in Piano for Doctor 1 (2)**

This course is designed to help students develop piano techniques as highly skilled professional players. Students take individual lessons with various piano repertoires that cover a diverse piano genre, including solo and ensemble

pieces. This course provides valuable opportunities to develop students' techniques in both practical and theoretical realms so that they can grow into accomplished musicians.

- **Major in Piano for Doctor 2 (2)**

This course is designed to help students develop piano techniques as highly skilled professional players. Students take individual lessons with various piano repertoires that cover a diverse piano genre, including solo and ensemble pieces. This course provides valuable opportunities to develop students' techniques in both practical and theoretical realms so that they can grow into accomplished musicians.

- **Major in Piano for Doctor 3 (2)**

This course is designed to help students develop piano techniques as highly skilled professional players. Students take individual lessons with various piano repertoires that cover a diverse piano genre, including solo and ensemble pieces. This course provides valuable opportunities to develop students' techniques in both practical and theoretical realms so that they can grow into accomplished musicians.

- **Major in Piano for Doctor 4 (2)**

This course is designed to help students develop piano techniques as highly skilled professional players. Students take individual lessons with various piano repertoires that cover a diverse piano genre, including solo and ensemble pieces. This course provides valuable opportunities to develop students' techniques in both practical and theoretical realms so that they can grow into accomplished musicians.

- **Major in Piano for Doctor 5 (2)**

This course is designed to help students develop piano techniques as highly skilled professional players. Students take individual lessons with various piano repertoires that cover a diverse piano genre, including solo and ensemble pieces. This course provides valuable opportunities to develop students' techniques in both practical and theoretical realms so that they can grow into accomplished musicians.

- **Orchestral Instruments Major Courses**

- **Conducting Technique (3)**

The course develops students' conducting skills in both theoretical and practical terms. Students learn basic instrumental conducting techniques and study various chamber and orchestral repertoires. Students also develop their rehearsal technique and score reading through orchestral rehearsals. The course aims to train students into professional level conductors.

- **Literature of Symphonic Music I (3)**

Students in this course will compare the styles of various repertoires in symphonic music (Baroque, Classic, Romantic, and Contemporary orchestral music) in order to gain a solid foundation of the characteristics of each period.

- **Literature of Symphonic Music II (3)**

Students in this course will compare the styles of various repertoires in symphonic music (Baroque, Classic, Romantic, and Contemporary orchestral music) in order to gain a solid foundation of the characteristics of each period.

- **Chamber Music Literature I (3)**

This course focuses on the study and analysis of prominent chamber ensemble repertoires. Students will compare chamber music styles from the Baroque period to Contemporary chamber music.

- **Chamber Music LiteratureII (3)**

This course focuses on the study and analysis of prominent chamber ensemble repertoires. Students will compare chamber music styles from the Baroque period to Contemporary chamber music.

- **Seminar on Orchestral Instruments I (3)**

This course highlights relevant topics and issues that have recently emerged in order to better understand and expand general knowledge in vocal music. The course consists of researching special issues and discussing those problems through acritical and logical approach.

- **Seminar on Orchestral InstrumentsII (3)**

This course highlights relevant topics and issues that have recently emerged in order to better understand and expand general knowledge in vocal music. The course consists of researching special issues and discussing those problems through a critical and logical approach.

- **Performance in Chamber Music (3)**

Students majoring in string, woodwinds, brass, and percussion research a variety of chamber ensemble repertoires from the Baroque to the modern period. The

course requires a study of each music period's chamber ensemble repertoires and techniques with various instruments. The objective of the course is to understand the basic concepts of chamber music and to develop performance skills.

- **History of Symphonic Development (3)**

Students will undertake the study of prominent symphonic repertoires from the Baroque to the Contemporary. The course will examine the critical works of illustrious composers of each period. Students may also engage in researching trends of the different time periods in detail.

- **Music Analysis I (3)**

This course focuses on the understanding of harmonic and formal structure of the works in each period. The course aims to train students that have intellectual knowledge of music.

- **Music AnalysisII (3)**

This course focuses on the understanding of harmonic and formal structure of the works in each period. The course aims to train students that have intellectual knowledge of music.

- **Major in Orchestral instruments for Master 1 (2)**

This course is intended to help students develop instrumental techniques. Through individual lessons, students gain both practical and theoretical knowledge of various instrumental repertoires including solo, ensemble, and orchestral works.

- **Major in Orchestral instruments for Master 2 (2)**

This course is intended to help students develop instrumental techniques. Through individual lessons, students gain both practical and theoretical knowledge of various instrumental repertoires including solo, ensemble, and orchestral works.

- **Major in Orchestral instruments for Master 3 (2)**

This course is intended to help students develop instrumental techniques. Through individual lessons, students gain both practical and theoretical knowledge of various instrumental repertoires including solo, ensemble, and orchestral works.

- **Major in Orchestral instruments for Doctor 1 (2)**

This course is intended to help students develop instrumental techniques.

Through individual lessons, students gain both practical and theoretical knowledge of various instrumental repertoires including solo, ensemble, and orchestral works.

- **Major in Orchestral instruments for Doctor 2 (2)**

This course is intended to help students develop instrumental techniques. Through individual lessons, students gain both practical and theoretical knowledge of various instrumental repertoires including solo, ensemble, and orchestral works.

- **Major in Orchestral instruments for Doctor 3 (2)**

This course is intended to help students develop instrumental techniques. Through individual lessons, students gain both practical and theoretical knowledge of various instrumental repertoires including solo, ensemble, and orchestral works.

- **Major in Orchestral instruments for Doctor 4 (2)**

This course is intended to help students develop instrumental techniques. Through individual lessons, students gain both practical and theoretical knowledge of various instrumental repertoires including solo, ensemble, and orchestral works.

- **Major in Orchestral instruments for Doctor 5 (2)**

This course is intended to help students develop instrumental techniques. Through individual lessons, students gain both practical and theoretical knowledge of various instrumental repertoires including solo, ensemble, and orchestral works.

- Collaborative Piano Major Courses

- **Seminar on Collaborative Piano I (3)**

This course highlights relevant topics and issues that have recently emerged in order to better understand and expand general knowledge in ensemble music. The course consists of researching special issues and engaging in discussions through a critical and local approach. In addition, students will study the required repertoire of various periods and genres which they can apply in practice.

- **Seminar on Collaborative Piano II (3)**

This course aims to develop each student's performance ability in order to help final recital. Students find the repertoire that suits the individual and concentrate research on it.

- **Seminar on Collaborative Piano III (3)**

This course aims to develop each student's academic ability in order to preparation for a professional musician.. Students find the repertoire that suits the individual and concentrate research on it.

- **Instrumental Accompanying Literature I (3)**

Students in this course will study and analyze prominent repertoires that focus on instrumental accompanying. In addition to comparing various aspects of performing techniques, the course requires students to research and perform repertoires of various genres regardless of composers or musical periods to gain a solid foundation as a professional.

- **Instrumental Accompanying Literature II (3)**

Students in this course will study and analyze prominent repertoires that focus on instrumental accompanying. In addition to comparing various aspects of performing techniques, the course requires students to research and perform repertoires of various genres regardless of composers or musical periods to gain a solid foundation as a professional.

- **Art Song Literature I (3)**

Students in this course will interpret and perform prominent repertoires that focus on German art songs. In addition to comparing various aspects of performing techniques, the course requires students to study German Diction to gain a solid foundation as a professional.

- **Art Song Literature II (3)**

Students in this course will interpret and perform prominent repertoires that focus on both French and English art songs. In addition to comparing various aspects of performing techniques, the course requires students to study French and English Diction to gain a solid foundation as a professional.

- **Art Song Literature III (3)**

Students in this course will interpret and perform prominent repertoires that



focus on both French and English art songs. In addition to comparing various aspects of performing techniques, the course requires students to study French and English Diction to gain a solid foundation as a professional.

- **Opera Literature (3)**

This course is designed to help students explore various aspects of opera coaching. Students research and analyze important operatic repertoires and learn practical application through performance.

- **Studies on Specific Composer I (3)**

In this course, students study and analyze the ensemble repertoire of a crucial composer in music history. Students participate in selective studies of critical ensemble music and give lectures on how to interpret and perform properly.

- **Studies on Specific Composer II (3)**

In this course, students study and analyze the ensemble repertoire of a crucial composer in music history. Students participate in selective studies of critical ensemble music and give lectures on how to interpret and perform properly.

- **Studies on Specific Composer III (3)**

In this course, students study and analyze the ensemble repertoire of a crucial composer in music history. Students participate in selective studies of critical ensemble music and give lectures on how to interpret and perform properly.

- **Major in Collaborative Piano for Master 1 (2)**

This course is designed to help students develop piano techniques as highly skilled professional players. Students take individual lessons with various piano repertoires that cover a diverse piano genre, including solo and ensemble pieces.

This course provides valuable opportunities to develop students' techniques in both practical and theoretical realms so that they can grow into accomplished musicians.

- **Major in Collaborative Piano for Master 2 (2)**

This course is designed to help students develop piano techniques as highly skilled professional players. Students take individual lessons with various piano repertoires that cover a diverse piano genre, including solo and ensemble pieces.

This course provides valuable opportunities to develop students' techniques in

both practical and theoretical realms so that they can grow into accomplished musicians.

- **Major in Collaborative Piano for Master 3 (2)**

This course is designed to help students develop piano techniques as highly skilled professional players. Students take individual lessons with various piano repertoires that cover a diverse piano genre, including solo and ensemble pieces.

This course provides valuable opportunities to develop students' techniques in both practical and theoretical realms so that they can grow into accomplished musicians.

- **Major in Collaborative Piano for Doctor 1 (2)**

This course is designed to help students develop piano techniques as highly skilled professional players. Students take individual lessons with various piano repertoires that cover a diverse piano genre, including solo and ensemble pieces.

This course provides valuable opportunities to develop students' techniques in both practical and theoretical realms so that they can grow into accomplished musicians.

- **Major in Collaborative Piano for Doctor 2 (2)**

This course is designed to help students develop piano techniques as highly skilled professional players. Students take individual lessons with various piano repertoires that cover a diverse piano genre, including solo and ensemble pieces.

This course provides valuable opportunities to develop students' techniques in both practical and theoretical realms so that they can grow into accomplished musicians.

- **Major in Collaborative Piano for Doctor 3 (2)**

This course is designed to help students develop piano techniques as highly skilled professional players. Students take individual lessons with various piano repertoires that cover a diverse piano genre, including solo and ensemble pieces. This course provides valuable opportunities to develop students' techniques in both practical and theoretical realms so that they can grow into accomplished musicians.

- **Major in Collaborative Piano for Doctor 4 (2)**

This course is designed to help students develop piano techniques as highly skilled professional players. Students take individual lessons with various piano repertoires that cover a diverse piano genre, including solo and ensemble pieces.

This course provides valuable opportunities to develop students' techniques in both practical and theoretical realms so that they can grow into accomplished musicians.

• **Major in Collaborative Piano for Doctor 5 (2)**

This course is designed to help students develop piano techniques as highly skilled professional players. Students take individual lessons with various piano repertoires that cover a diverse piano genre, including solo and ensemble pieces.

This course provides valuable opportunities to develop students' techniques in both practical and theoretical realms so that they can grow into accomplished musicians.

□ **Faculty Members**

□ Voice Major

**Kim, Hyang Ran**

Soodo Women Teachers College, B.A.  
Italy Santa Cecilia conservatory, graduation  
Osimo Accademia, graduation  
Voice (Soprano)  
1998011@kookmin.ac.kr

**Oak, Sang Hoon**

Seoul Univ., B.M.  
Master of Music Boston Univ., M.A.  
State Univ. of New York at Stony Brook, D.M.A.  
Voice (Tenor)  
shoak@kookmin.ac.kr

**Byun, Seung Wook**

Hanyang University, B.M.  
Italy Milano G.Verdi Conservatorio, graduation.  
Voice (Bass)  
byunwook@kookmin.ac.kr

**Ko, Seong Ho**

Hanyang University, B.M.  
Italy Parma conservatory, graduation  
Accademia di Europea, graduation  
Choir Conducting, Voice(Tenor)

□ Piano Major, Collaborative Major

**Lee, Sun Kyung**

Seoul National Univ., B.M.  
Seoul National Univ., M.A.  
Boston Univ., D.M.A.  
Piano Performance  
kyung@kookmin.ac.kr

**Yoon, Chul Hee**

Freiburg Musik hochschule Diplom  
Trossingen Musik hochschule Aufbau  
Trossingen Musik hochschule Solist  
Piano Performance  
chy1107@kookmin.ac.kr

**Yoon, Young Hwa**

**Pee. Kyung Sun**

Seoul National Univ., B.M.  
Seoul National Univ., M.A.  
Eastman School of Music Univ. of Rochester, D.M.A.  
Piano Performance & Literature  
yhyoon@kookmin.ac.kr

Juilliard school of Music, B.M.  
Moscow Tschaikowsky state Conservatory, M.A  
Moscow Tschaikowsky state Conservatory, D.M.A  
(Aspirant)  
Piano Performance  
lucilpee@kookmin.ac.kr

**Kim Min Sook**

Seoul National Univ., B.M.  
Folkwang-Hochschule Essen Diplom  
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**Kim Sun Ah**

Yoen Sei Univ., B.M.  
Boston Univ., M.A.  
Boston Univ., D.M.A.  
Piano Performance  
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**Han, Ji Eun**

Seoul National Univ., B.M.  
Seoul National Univ., M.A.  
Eastman School of Music Univ. of Rochester, D.M.A.  
Piano Accompanying & Chamber Music  
jehan@kookmin.ac.kr

❑ Instrumental Major

**Kim, Hoon Tae**

Seoul National Univ., B.S.  
Wien Musik Hochschule Diplom  
Kiev Tchaikovsky Academy of Music Diplom  
Gnesin's Academy of Music, D.M.A.  
Orchestra Conducting  
htkim@kookmin.ac.kr

**Yu, Bong woo**

Seoul National Univ., B.M.  
Univ. of Georgia, M.M.  
Florida State Univ., D.M.  
Violin Performance  
vnyu@kookmin.ac.kr

**Woo, Ji yeon**

Hannover Hochschule for Musik u Theater, Kunstlerische Ausbildungsklasse  
Hannover Hochschule for Musik u Theater, Solo Klassen(Konzertexamen)  
Toulouse Musik Conservatory, Superieur Perfectionnement  
Violoncello Performance  
wjiyeon@kookmin.ac.kr

**Shin, Yoon kyung**

Seoul National Univ., B.M.  
New England Conservatory, M.M.  
State Univ. of New York, D.M.A.  
Violin, Viola Performance  
ykshin@kookmin.ac.kr

**Sohn, Chang woo**

Yeon-sei Univ., B.A  
Yale Univ., M.M  
Boston Univ. , Ph.d (not finished)  
Contrabass Performance  
sohn0808@kookmin.ac.kr

Kim, Sung-hae  
D.M.A., State University of New York at Stonybrook  
P.D., Indiana University at Bloomington  
Maesterklasse. Hochschule für Musik und Theater  
München  
B.M., Seoul National University

Hwang, Soon-bin  
R-S-H Duesseldorf Konzertexamen, Diplom  
Bachelor of Music, Seoul National University

Lee, Bong-hwan  
M.M., Ausbildung Stufe, Konservatorium der Stadt  
Wien (Diplom.)  
B.M., Konservatorium der Stadt Wien (graduated  
first in class)

□ Composition major

**Keel, Il Sup**

Seoul National Univ., B.M.

Seoul National Univ., M.A.

Temple Univ., D.M.A.

Composition

keeler@kookmin.ac.kr

**Kim, Kyung Jung**

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Kyung-Hee Univ., M.A.

Essen-Folkwang Hochschule, Diplom

Composition

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## Dept. of Fine Art

Our mission is to provide creative educational programs, to raise awareness of visual culture, and to encourage students to be responsible contributors to society. The Department of Fine Art has three distinctive majors: Painting, Sculpture, and Art Theory and Criticism.

### □ Painting Major

The painting department prepares its students by developing strong visual skills, keen critical reasoning, and a broad historical and social overview, so that they engage in an individual search for meaning and representation within their backgrounds. All students are encouraged to participate in a wide variety of programs such as painting, drawing, printmaking, photography, video, computer-based art, installation, as well as Korean traditional painting. Class field trips to museums, galleries, and artists' studios will provide students to exercises in observation and the forming of ideas.

### □ Sculpture Major

The sculpture curriculum prepares you to think independently and critically, to gain a command of the technical processes inherent to sculpture as a means of realizing your ideas, and to develop a true understanding of sculptural issues. Students will learn through studio work, group discussion, lectures, seminars, individual consultations, and frequent visits to museums, galleries, and artists' studios.

### □ Art Theory and Criticism Major

The art theory and criticism department explore the interace between the creative and the critical. Students are encouraged to experiment with emerging interdisciplinary topic, and to study a wide range of courses in cultural studies, the history of fine arts, the history of Asian art, humanities, art theory, as well as internship program.

### □ Intermedia Art Major

The aim of the MFA in Intermedia Art is to develop new possibilities in art by studying fields of various medias that makes intersections between ideas and emotions, which can be synthesized in contexts of the humanities and was occurred not only in the visual art, but through the arts in general. Through the MFA program, students can determine their ways to make artworks and can study on recent discourses in media arts, as well as context in critiques so that students can build foundation for further development of their works. Our goal is to renovate the concepts and the methods of art works by approaching complex symptoms of art based upon the phenomenons in

new media.

## ☐ **Courses**

### ☐ Core Courses

- **Contemporary Art Seminar I (3)**

Seminar on contemporary art and theory, focusing on analyzing both the styles and discourses on contemporary art.

- **Contemporary Art Seminar II (3)**

Advanced seminar on contemporary art and theory, focusing on analysing both the styles and discourses on contemporary art.

- **Special Topics I (3)**

Students in doctoral course are expected to find deeper meanings to develop their individual thesis specifically through one by one meeting with professors. The purpose of this way of teaching is to make up the missed aspects of group studies. Students will be able to intensify their own points of view within thesis statements through this study.

- **Special Topics II (3)**

Students of doctoral course are expected to find deeper meanings to develop their individual thesis specifically through one by one meeting with professors. The purpose of this way of teaching is to make up the missed aspects of group studies. Students will be able to intensify their own points of view within thesis statements through this study. Further achievements are expected to get in this class, compared to Special Topics I.

### ☐ Painting Major Courses

- **Painting Analysis & Seminar (3)**

Analyze and study the trend which extended over present art by centering drawing.

- **Organizing Exhibition Seminar (3)**

Analyze and study about planning and performance related to publication of work.

- **Painting Study (3)**

Individually study and produce about entire course over the notion, expression, and production of drawing work.

- **Painting & Space Study (3)**

Study and produce about entire course over the notion and expression of drawing work that has spacious sense.

- **Contemporary Painting Study (3)**

Study and produce about entire course over from the notion to the expression of present drawing work.

- **Mixed Media Art Study (3)**

Research experiment and expression of complex medium through work production by a plane, dimension and installation.

- **Printmaking Study (3)**

Produce engraving work by studying fundamental and manufacturing procedure of engraving.

- **Contemporary Drawing Study (3)**

Study the concept of expanded present drawing and produce drawing works.

- **Fine Art & Field Research (3)**

Conduct various studies about field of present art.

- **New Art Study (3)**

Study and analyze about new medium and genre, and produce various works of medium through techniques, comprehension of its structure and practice.

- **Concept & Expression Study (3)**

Study and produce works that include further concept by analysis and interpretation through theory in terms of content and formality of the work.

- **New Art Workshop (3)**

Analyze new mediums and meaningful works, and analyze the relationship between present art and society by criticism and discussion method through work study of cases.

- **Experiment Art Study (3)**

Recriticize preexisting art, study whole course that reaches new meanings, concept and expression by analyzing its experimental possibility.

- **Studio workshop I (3)**

The Works of students are viewed and discussed in relation to other current



practices, as well as in terms of the ambient cultural environment. A wide variety of source material is read, screened, and discussed. Assigned projects and presentations are premised upon the specific issues suggested by the works under discussion.

- **Studio workshop II (3)**

The Works of students are viewed and discussed in relation to other current practices, as well as in terms of the ambient cultural environment. A wide variety of source material is read, screened, and discussed. Assigned projects and presentations are premised upon the specific issues suggested by the works under discussion.

- **Studio workshop III (3)**

The Works of students are viewed and discussed in relation to other current practices, as well as in terms of the ambient cultural environment. A wide variety of source material is read, screened, and discussed. Assigned projects and presentations are premised upon the specific issues suggested by the works under discussion.

- **Studio workshop IV (3)**

The Works of students are viewed and discussed in relation to other current practices, as well as in terms of the ambient cultural environment. A wide variety of source material is read, screened, and discussed. Assigned projects and presentations are premised upon the specific issues suggested by the works under discussion.

- **Study on Exhibition (3)**

Students are required to study on organization of exhibition. The exhibition functions as a chance to show works of artists, and furthermore, the exhibition needs to clearly suggest directions on which every detail of the exhibition is based. This study includes all the efforts made to decide directions of the exhibition, select the art works, make the advertisements, and estimate the result and influence of it.

- **Study on Contemporary Korean Art (3)**

Students are required to study on universal and specific aspects of Korean Contemporary art through theoretical analysis of its formation and progress.

- **Study on Modern Korean Art (3)**

Students are required to study on universal and specific aspects of modern Korean art through theoretical analysis of its formation and progress.

- **Study on Korean Traditional Art (3)**

Students are required to study on universal and specific aspects of traditional Korean art through theoretical analysis of its formation and progress.

- **Study on Contemporary Asian Art (3)**

A wide range of study on Asian contemporary art including Korean contemporary art is necessary for understanding regional specificity of Korea. Students are required to advance their own study in terms of cultural relationships among neighboring countries.

- **Study on Traditional Asian Art (3)**

A wide range of study on Asian traditional art including Korean traditional art is necessary for understanding regional specificity of Korea. Students are required to advance their own study in terms of cultural and historical relationships among neighboring countries.

- **Study on Media of Art (3)**

Students are encouraged to accept the experiences of experimenting diverse media as chances to extend their own potentials. In the process of adapting themselves to such situations as fusing methodologies of media in creative ways, students are expected to achieve their own solution to create new possibilities of using media differently.

- **Study in Discussion of Contemporary Art (3)**

A wide variety of discourses formed in the field of contemporary art is studied and discussed in the class. Students are required to grope for their own critical points of views through researching diverse discourses and reflecting on them creatively.

- **Analysis and Criticism of Art Works (3)**

Students are required to study on a wide variety of notable analysis and criticisms of art works based on their own understanding of philosophy and history of art criticism. This study is expected to lead students to develop the ability of criticizing art works.

- **Sculpture Major Courses**

- **Thesis and Subject Research (3)**

Study and organize the subject of thesis approached from various points of view for the format, content, and background of artworks.

- **Organizing Exhibition Seminar (3)**

Summarize the importance of exhibitions in the culture of art. Also analyze and do researches on the whole progress step by step of how it is planned and preceded with different type of exhibitions. Find out institutional equipments that can solve the problems which can occur during the exhibition, and find out how to maximize the effects of exhibitions. Do a research on an excellent exhibition case and proceed by presentations and debates.

- **Installation Art Research (3)**

Find out new formalities, techniques, and concepts on the basis of the existing 3D art and extend the field of expression to study and create an innovative piece of work, as a member of the society contact into ones world and figure out how to sublimate some kind of a message into art.

- **Contemporary Art Studio I (3)**

Interpret the concept of the artworks based on contemporary art and study in-depth method of expression.

- **Contemporary Art Studio II (3)**

Develop the concepts of artworks in depth to find the direction of creative artwork activities.

- **Religion and Fine art (3)**

This course examines religions that are inevitably connected to art and explores deeply how they can be expressed through modern and contemporary ways of thinking.

- **3D Art Studio I (3)**

Produce creative works by analyzing the contents and format of artworks.

- **3D Art Studio II (3)**

Study content, style, and background of artworks from different angles and build in-depth creative visual language.

- **Public Art Research (3)**

Identify the characteristics of a variety of public art that transformed modern society, depending on the environment and the conditions, and search the new direction of public art.

- **Media Art Research (3)**

Search the theories of media that are based on aesthetic and interpret the discussions of various media that are accepted in the art.

- **Sculpture and Discourse (3)**

Develop logically of artworks on the basis of philosophical thinking and apply it to the productions.

- **Thesis Research I (3)**

Study the specific details and elements involved in the thesis to be able to develop thesis based on artworks.

- **Thesis Research II (3)**

Research the specific factors involved in the thesis, and complete the study deeply.

- **Religion and Contemporary Art Research (3)**

Study the close relationship of art and religion through specific materials, and apply it in terms of contemporary art.

- **Subject of Art work Research (3)**

After review the background of the topic based on creative individual works, organize, establish and develop it.

- **Discourse Analysis Research (3)**

Analyze and explore discourses of contemporary art on the basis of philosophical thinking to apply them to artworks.

- **New media Art Research (3)**

Search the first generation of media art which is represented by photography and film and the second generation which is represented by TV and radio through the related texts to apply the theory to modern media.

- **3D Art and the Humanities Study (3)**

Study and develop the issues of content and format through a variety of research of the humanities.

- **3D Art and Contemporary Art Analysis (3)**

Research a variety of discourses of Contemporary Art and analyze the relation between art and society to acquire critical review.

- **Contemporary Sculptor Research (3)**

Analyze and study the work of the artist based on the relation of personal and

social background.

- **Contemporary Art and Urban Environment (3)**

Search the public art and urban environment in the rapidly changing modern society and explore the new aim of public art.

- **Media Convergence Research (3)**

Search the third generation of media art which are represented by computer and internet. Furthermore research the theory of media which is based on confusion technology and analyze critical discourse related to media artworks.

- **Organizing Exhibition & Research (3)**

Exhibition has 4 essential parts, artist, work, audience, and location. But an exhibition has a very complicated interest concerning the meaning and the ripple effect in the society. The establishment of the concept and the strategy from the exhibition and the set out, it has a great influence of the artist's and audience's satisfaction. In a way, analyze and understand the tendency at the actual spot of the art exhibitions inside and the out side of the country. Also, having an interview with a professional planner and planning a possible exhibition together.

- **3D Art and Contemporary Art History (3)**

Research deeply the change and direction of art through contemporary art history.

□ **Art Theory and Criticism Major Courses**

- **Twentieth-Century Art History (3)**

This course examines Twentieth-century art history practices along with the theoretical formation and development of modernism and postmodernism.

- **Theory and Practice of Curating (3)**

This course aims to enhance students' knowledge of curating both in theory and practice.

- **Museum in Contemporary Society (3)**

This course examines the history and role of the museum in relation to the cultural, economic, and political context of contemporary society.

- **History of the Cultural Exchange between the Arts of the East and the West (3)**

This course investigates the history of cultural exchanges between the east and the west focusing on the expansion of Buddhism and its art.

- **East Asian Art and Culture (3)**

This course investigates the dynamic relationship between the art and cultures in East Asia, focusing on Korea, China and Japan.

- **Public Art (3)**

This course examines the practices and discourse of public art in modern society and culture.

- **Mass Culture and Images (3)**

This course examines the significance of mass culture and images, which have challenged and changed modern art practices.

- **Modern Culture and Society (3)**

This course examines interdisciplinary discussions to enhance an understanding of cultural practices in modern society, covering modern philosophy, semiotics, psychoanalysis, and cultural theories.

- **Korean Contemporary Art (3)**

This course examines the development of Korean contemporary art practices and criticism in the context of globalization.

- **Japanese Modern / Contemporary Art (3)**

This course investigates the history and critical discourses of modern and contemporary art in Japan.

- **Chinese Modern / Contemporary Art (3)**

This course investigates the history and critical discourses of modern and contemporary art in China.

- **Art and Law (3)**

This course aims to familiarize the student with legal issues in relation to the artist's rights by examining various case studies.

- **History of Photography (3)**

This course examines the history and development of photography along with photographic discourse.

- **Digital Art (3)**

This course examines the development and practices of digital art along with the discursive discussion on its significance.

- **Media Art (3)**

This course examines the development of new media art and discusses media theory in relation to contemporary art.

- **Technology and Art (3)**

This course examines the relationship between technology and art, which has changed the mode of creation, existence, and collection of art.

- **Methodology of Art History (3)**

This course aims to enhance an understanding of the methodology in art history.

- **New York School (3)**

This course investigates the historical and theoretical formation and development of New York School.

- **Pop Art (3)**

This course examines the significance of Pop Art in the discursive context of postmodernism.

- **Modernist and Postmodernist Criticism (3)**

This course investigates and critically analyzes the modernist and post-modernist discourses in art.

- **Contemporary Art (3)**

This course examines diverse art practices since 1980s in the context of globalization.

- **Modern / Contemporary Art Criticism (3)**

This course investigates and analyzes art criticism in modern and contemporary art, while examining diverse art practices.

- **Modern Aesthetics (3)**

This course aims to enhance an understanding of the aesthetics in relation to the formation and development of modern art.

- **Research Ethics and Thesis Tutorial (3)**

This course aims to familiarize the student with the process of developing a thesis, leading a logical discussion, and research ethics.

- **History and Philosophy of Art Education (3)**

This course examines the historical development and philosophical foundation of art education, and explores the theoretical and practical basis of contemporary art education.

- **Community Art and Education (3)**

This course investigates the purposes and types of community art, and analyze development and cases of community-based art education from multiple perspectives.

- **Internship (3)**

This course aims to enhance student's understanding and experience of curatorial practices through an internship.

□ **Intermedia Art Major Courses**

- **Intermedia Art workshop 1 (3)**

By accepting discussion about interaction and consilience among various media and genres of arts, this subject leads each student to try new form of arts. Through diversified media and core reasons penetrating formality, the study inspires students to discover potential within each sensual component, and allows those components to be interacted to develop their works.

- **Intermedia Art Workshop 2 (3)**

By accepting discussion about interaction and consilience among various media and genres of arts, this subject leads each student to try new form of arts. Through diversified media and core reasons penetrating formality, the study inspires students to discover potential within each sensual component, and allows those components to be interacted to develop their works.

- **New Media Art Workshop 1 (3)**

Based on triggered consciousness due to new media, the study experiments virtual experience and possibility of mutual interaction, and analyzes the formation of future-oriented art discussion. Exposing students to new examples, which form the theoretical basis, and helping the students to have in-depth understanding about them, the study leads, based on the understanding, each student to expand and deepen perspective and attitude toward arts. Carrying out the theoretical research and actual application at the same time, the study leads students to create sensual and conceptual art works.

- **New Media Art Workshop 2 (3)**



Based on triggered consciousness due to new media, the study experiments virtual experience and possibility of mutual interaction, and analyzes the formation of future-oriented art discussion. Exposing students to new examples, which form the theoretical basis, and helping the students to have in-depth understanding about them, the study leads, based on the understanding, each student to expand and deepen perspective and attitude toward arts. Carrying out the theoretical research and actual application at the same time, the study leads students to create sensual and conceptual art works.

- **Documentary Art Workshop (3)**

Based on the fact that video arts was oriented from recording of the direct action, students reflect upon arts with incidental characteristics such as performances and happenings, and the study leads students to understand the unique context, resulted from aspects of the document, within art society. The study also leads students to reach creative idea and development of work through understanding of the mutual structure among arts and archives of the document.

- **Film Aesthetic and Art (3)**

Artistic aspects and revolutionary trials shown in the history of movie are results from mutual interaction with overall phenomena in culture and artistic styles at that time. The study leads students to consider the compounding mutual relationship crossing among paintings, literature and films, and induces, based on this consideration, students to understand critical flow in arts. Especially, the basic aim of the course is to discuss mainly artistic field related to and developed from film arts including video arts, and to adopt them as the foundation of work.

- **Visual Thinking and Society (3)**

Beginning from the discussion of consciousness and vision, the study covers social issues reflected by psychological interests. Through others, the study induces students to reconsider problems of each student. Broad topics including ideology and sexual identity, which lie on the outskirts of political, economic and cultural problems, are dealt within field of arts to inspire interests of students.

- **Network and Art (3)**

Students reflect upon various topics such as internet media, net arts, social network services, etc. Within the network including the virtual reality, the study eliminates the boundary between a daily life and field of arts to search for any

possibility of artistic participation and communication.

- **Site-specific Art Workshop (3)**

Originated from the site-specific discussion from the land art in 1960s, the study analyzes application and invention of artistic concepts based on human geographical understandings. The pretest is performed based on topology, geography and geology, and the primary goal of students is to conceptually understand various meanings from each location. Though it was inspired from understanding of the social context, the study also derives the ultimate solution of work by accepting in detail the complex reactions arising from emotional aspects.

- **Seminar on Thesis 1 (3)**

Students choose their own thesis topics regarding directions of their works, and perform theoretical and practical pretest. Deep analysis for the work and theoretical basis that can be used as references is performed, and based on this, logical and artistic approaching about intuitive examples is proceeded.

- **Seminar on Thesis 2 (3)**

Students choose their own thesis topics regarding directions of their works, and perform theoretical and practical pretest. Deep analysis for the work and theoretical basis that can be used as references is performed, and based on this, logical and artistic approaching about intuitive examples is proceeded.

- **Discourse on Media Art (3)**

The unfolding and development process of media arts are considered within the historical contexts of modern arts, and the students look into theoretical discussions on the roles and features of arts and change in communication methods which arise from the introduction of new media. Through researches among students, the discussion about the expansion of various media adopted within field of arts is deeply considered as well.

- **History of Media Art (3)**

Among development stages of history of modern and present arts, students observe developmental stages of media arts that was born not from classical media but from emergence and introduction of mechanical and technological media. Students make a comparative study on the developmental stages and history of art, look into the historical development of the developmental stages with in the relation with the history of art, and historically reflect upon the discussion about identity of media arts.

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## Dept. of Performing Arts and Multimedia

We offer programs for the talented artists and scholars who will carry academic research, artistic creations, and practical education in professional way by combining theoretical study and methods of practical education. For this purpose, each student will be focused on developing inventive teaching methods, understanding a realistic awareness of the modern art world, and active relationships with international educational institutions. In doing so, students will take part in developing both in the performing arts and multimedia areas.

### ❑ Theatre Major

The purpose of the Musical and Theatre Creation Major is to educate students to become skillful and creative professional artists in areas of acting, directing, producing, and educating. Students research the theories and practices of major productions around the world with cross-cultural perspectives. At the same time, they are encouraged to rediscover the theatrical heritages of the traditional performing arts and explore the aesthetics and methods to make them relevant to contemporary global trends. To enhance the intensity of the program we offer various workshops and independent studies, which result in actual productions each semester. The best works are further developed into the repertoires for an affiliate company, the Kookmin Repertory Theatre.

### ❑ Film & Television Major

The Master of Arts in Film & Television major is focused on developing a critical viewpoint in film and theoretical studies in order to understand and analyze multimedia materials. We also offer intensive workshops and seminars that help to inspire the student's creativity and theoretical knowledge in films.

### ❑ Dance Science Major

The Dance Performance Major aims to raise performance-related personnel including choreographers and other staff in charge of performance. For this purpose, emphasis is placed upon providing students with an education in dance theories and methodology in addition to a variety of dance composition. Ultimately, the dance performance courses will be focused on in-depth scientific analysis of dance in relation to other genres of performing arts, thus laying a foundation for a new area of performing arts.

### ❑ Acting MFA Major

The program provides higher education for students who need intensive

training to become professional actors and acting teachers. The two year program is designed to teach acting, acting technique, period acting, scene study, script analysis, movement, voice and speech, collaboration, and creative workshop to make plays. Our program is focused on intensive training for small group of actors and aims to train professionals in the field of theater and film. The students are encouraged to experiment and exercise their education in and outside of their classrooms.

## ☐ **Courses**

### ☐ Theatre Major

- **Performance Criticism Theory (3)**

Performance criticism and theory, emphasizing styles as evidence of historical, cultural, and ideological concerns. Students write in the style of various performances discussed.

- **Stage and Culture (3)**

The aim of this class is to explore different ways in which theatre as an art to explore its own aesthetical, political or philosophical dimensions.

- **Narrative Creating Workshop (2)**

This course emphasizes on collaboration among faculty members and students. Students are conceive, write, and present writing project which will get feedback and criticism from instructor.

- **Applied Theatre Workshop (2)**

This course offers for professional careers in playwriting, direction, acting, music writing, and producing will collaborate to create their own production to be staged in the theatre.

- **Directing Seminar (2)**

In this course students learn how to direct performing art effectively within the tradition of dramatic literature and the culture context and to create a work on the stage.

- **Performance and Culture (3)**

The aim of this class is to analyse about various performances in terms of dramatic and performing points.

- **Integrative Studies of Performing Art History (3)**

This course offers an overview of integrative history of the performing arts. It will focus primarily on the evolution of the dramatic musical over the past 50 years, and bridges the theory and performance practice of performing arts.

- **Music Drama Seminar (3)**

A survey of vernacular theatre music in History from its European roots in Opera Buffa, Ballad Opera, and Operetta through the Jazz developments of the sixties.

- **Musical Theatre Vocal Pedagogy 1 (3)**

This course involves the study of some physiology and anatomy of the larynx, breathing, phonation, resonance, vowel formants, timber, registers, and vocal health.

- **Musical Theatre Vocal Pedagogy 2 (3)**

This course facilitates for musical theatre performers, vocal performers, voice teachers, choir directors, musical directors, and other professionals: understandings of contemporary voice science methodology, research, and clinical practice that have particular application for the voice studio, choir rehearsal, musical theatre rehearsal, and/or individual careers in voice performance, and dialogue between voice science and the vocal arts can be mutually informative.

- **Applied Music Drama Workshop (2)**

This course make and perform in direction the creative musical theatre and licensed works that participate in musical director, writer, composer, actor, choreographer, producer.

- **Voice Therapy (2)**

The aim of this course is starting point in identifying vocal problems which related to overuse and misuse. This course is designed to develop confidence in voice and communication skills both for everyday life and the professional sector. The skills provide students to read effectively, speak with clarity, find a optimal speaking pitches, and make presentations to a variety of audiences.

- **Musical Theatre Lab Supervised Teaching (2)**

This course examines vocal anatomy and physiology as they pertain to respiration, phonation, resonance, articulation, and lifespan vocal development; surveys the acoustic properties of sound as they relate to voice production and perception; considers pedagogical strategies for working with voices of various age levels, abilities, and prior learning experiences, including diagnosing inefficient vocal phenomena and implements learning experiences to modify them.

- **Applied Acting 1, 2 (2)**

This course is designed to study the history of actor training in modern and contemporary theater for educator and actors. Through the course study students examine how each acting method influenced the actors, acting styles, and the theater production of its time periods.

- **Applied Vocal Performance 1, 2 (2)**

This course provide the various singing styles: classical, pop, rock, jazz and individual private voice instruction with an emphasis on healthy full-range vocal production for the musical theatre.

- **Voice for Actors (2)**

This course is designed to provide understanding of human body, breathing, and voice for actors as well as singers. Students learn effective process of voice production through various exercises based on Alexsander Technique and Gillyanne Kayes Technique. Also students have chance to apply their acting by using both play and musical theatre.

- **Independent Study I, II (2)**

Advanced study. The class offers various topics according to the students needs.

- **Special Directing Project: The Creative Integration (3)**

A seminar course for students performing significant production works on multi-cultural and national theatre projects. Students serving as producers, directors, writers, and stage directors.

- **Studies of Narrative Performance in Culture (3)**

This course offers a historical and cultural exploration of theatre forms and performance cultures from various sources that symbolize traditional heredities. The class examines indigenous theatre and performance as well as modern performing arts.

- **Performing Art and Eduction (3)**

This class focus on contemporary performing arts as a site of rich phenomena of cultural responses. Students will collect various sources, and diagnose and analyze them, and create their own thesis/dissertation.

- **Applied Musical Theatre Workshop (2)**

This class focus on contemporary performing arts as a site of rich phenomena of cultural responses. Students will collect various sources, and diagnose and analyze them, and create their own thesis/dissertation.

❑ Film & Television Major

• **Introduction to Modern Film Theory (3)**

Introduction to the classical and contemporary film theories and the exploration of their relationship to the cinematic experimentation.

• **Study of Broadcasting Television (3)**

Study of visual structures of film and television in space, line, color, composition, angle, and the difference of style on directing.

• **Theory of Broadcasting Television Industry (3)**

Theory expands to examine the industry of story ideas through script development, production and exhibition. The evaluation process played by writers, agents, studio executives, marketers and publicists.

• **Theory of Film Genre (3)**

Analyze various issues of genre films and explore its styles in film history.

• **Theory of Multimedia Film/Broadcasting Television (3)**

Examines theoretical approaches to innovative format and techniques in multimedia fields including film, television and the internet.

• **Study & Analysis on Screenplay (3)**

Introduction to and overview of the elements of theme, plot, character, and dialogue in dramatic sequence of writing for film and television.

• **Study on Film Analysis & Criticism (3)**

Analyze films in various aspects including criticism and narrative structure.

• **Methodology of cinematherapy(3)**

The Methodology of Cinematherapy is a study form of therapy or self-help that uses movies, particularly videos, as therapeutic tools. Cinema therapy can be a catalyst for healing and growth for those who are open to learning how movies affect people and to watching certain films with conscious awareness. Cinematherapy allows one to use the



effect of imagery, plot, music, etc. in films on the psyche for insight, inspiration, emotional release or relief and natural change.

- **Study on Western Directors (3)**

Analyze issues of race, class, and gender in world cinema including Asia, Europe, America, and Third-World cinema as well as their historic changes and functions.

- **Study on Korean Directors (3)**

Explore in more Korean-famous directors' complex directing styles concentrating both on ideology and exploration of their point of view in film.

- **Study on Film History(3)**

Study on Film History is a comprehensive study of the medium that covers the development of every genre in film, from drama and comedy to documentary and experimental. This Class is thoroughly includes the first comprehensive overviews of the impact of globalization and digital technology on the cinema.

- **Moving pictures and Photography Theory (3)**

Study of convergence of photography and moving image theory. The study focuses on development from photography to movies including the future 3D technologies.

- **Study on Film Style (3)**

Examine how aesthetics are figured in cinema and film with an emphasis on the development of film history.

- **Study on Documentary Film / Broadcasting Television (3)**

Studies on its characteristic styles and structures in contemporary documentaries on films and television.

- **Study on advertisement marketing of Image Contents(3)**

The investigation of film markets and how they interact in the real world. Students are able to develop an understanding of differences between film market in Korean and overseas. Also in planning for the film market, promotion and advertising.

- **Study on Film broadcasting Policy(3)**

Examine on the international film policy, law and rating systems etc.

- **Seminar on Criticism of Film Television(3)**

Critical study on social influence and its effect on television. The study includes trend on television's contents and reflecting future transition of smart revolution.

- **Seminar on Filmologie Research Methodology(3)**

Understanding the variety of film studies and analysis of modern research methodology by applying it to the film text and find a way to run an in-depth study of the movie

- **Seminar on Individual Research Project(3)**

Proceed with the process of individually selected and developed under a research project to study the subject of the seminar will be to present and discuss the form and complete the result.

- ❑ **Dance Science Major**

- **Theory of Dance Science (3)**

The course deals with the disciplinary structures of dance science and dance research methodology on the basis of both theoretical and empirical evidences from various sources of human, social and natural sciences.

- **Theory of Dance Art (3)**

The course aims 1) to identify the core elements and principles of dance composition based on the basic knowledge of choreography, 2) and to study different approaches to dance improvisation through harmonizing reason-based logics and emotional inspiration in the processes of choreography.

- **Dance Teaching-Learning Theory (3)**

The course aims to understand concepts and process of dance movement learning and to acquire research method through studying mechanism of acquisition of skillfulness.

- **Dance Education Content Planning (3)**

The course aims to understand concepts, methodology and parameters of analysis for dance movement analysis through applying principle and method of dance movements.

- **Dance Education Content Production Workshop (3)**

The course aims to acquire teaching method through practical and systematic

methodology for Korean dance education based on the general teaching-learning theories.

- **Dance Literature (3)**

The course intends to achieve the understanding of theoretical terms which are necessary to know literally the basic dance through the reading dance book written in English.

- **Seminar on Dance Teaching Method (3)**

The course touches on the philosophical, psychological and sociological foundations of dance education by surveying the concepts, characteristics, values and importance of dance education from historical perspectives.

- **Seminar on Dance Management (3)**

The course intends to provide students with the experiences regarding the processes of dance planning and dance production in terms of philosophy of dance managements, method of advertisement, surveys with analysis of dance performance, marketing, and financial management along with practical performance experiences.

- **The Study of Dance Psychology (3)**

The course intends to achieve the understanding of various psychological variables and their mechanism in relation to dance performance.

Included in this course are topics such as psychological factors influencing both learning and performance of dance, methods of practice, feedback, retention, transfer in addition to dealing with such performance variables as information, and peak performance.

- **The Study of Dance History (3)**

The course attempts to survey the evolution and developmental trends of dance as an art through historical research methodology.

The course, thus, focuses on 1) studying the nature, characteristics, and values of dance, 2) diagnosing dance art by means of historical approach, thus laying the foundation of anthropological and cultural aspects of dance.

- **The Study of Dance Music (3)**

The course aims to research musical concepts and principle for dance music through application of dance music themes theories.

- **Seminar on Dance Composition (3)**

Practical experiences regarding the whole processes of dance production will be provided. Specifically, the processes of planning, producing and choreographing involved in dance performance will be taught in relation to dance music's, stage designs, and acting, etc.

- **Seminar on Dance Aesthetics and Criticism (3)**

In this course, concepts, natures, and values of dance aesthetics as well as dance art are

discussed in view of historical trend and theories of philosophy of arts, thus making students understood the universality and specificity of dance aesthetics. Students in this course will acquire the ability to interpret and evaluate major dance works of historically renowned choreographers and dancers in terms of chronological

- **Dance and Culture (3)**

Knowledge and theories relative to fine art aspects of dance performance will be provided in this course, so that students can apply them to production of dance.

- **Dance and Media Workshop (3)**

In this course, various dance training methods and techniques are to be taught to students so that they can select and apply different physical training methods and instructions depending on the specific goals of dance training.

- ❑ **Acting MFA Major**

- **Voice for Actors (3)**

This course is designed to provide in-depth understanding of human body, breath, and voice for actors. Students learn effective process of voice production through various exercises based on Linklater technique to improve self awareness and vocal effectiveness for actors.

- **Acting Technique 1 (3)**

This course explores various approach to act on stage in order to provide actors with structural and intuitive tools in acting. The course includes physical exercises, scene and character studies, script analysis, and various acting methods through group and individual settings.

- **Movement for Actors 1 (3)**

The aim of this course is to provide in-depth understanding of human body through movement. Students will learn fundamentals of movement in theater acting and the functions of effective movement in theater. The course includes physical training, various exercises to introduce different styles of movement for actors.

- **Voice and Speech (3)**

Based on the previous work in "Voice for Actors", in this course, students explore image, thought, meaning of language, sound and movement, and emotional intelligence. The course challenges students to apply voice work into their acting by using both classical

and contemporary texts.

- **Acting Technique 2** (3)

This course explores various approaches to act on stage in order to provide actors with structural and intuitive tools in acting. The course includes physical exercises, scene and character studies, script analysis, and various acting methods through group and individual settings.

- **Movement for Actors 2** (3)

The aim of this course is to provide in-depth understanding of human body through movement. Students will learn fundamentals of movement in theater acting and the functions of effective movement in theater. The course includes advanced physical training, in-depth exercises to introduce different styles of movement for actors, and composing a movement theater piece.

- **History of Acting** (3)

This course is designed to study the history of actor training in modern and contemporary theater. Through the course study, students examine how each acting method influenced the actors, acting styles and the theater productions of its time.

- **Voice Pedagogy** (3)

The course provides students with the opportunity to learn the entire Linklater voice progression as a teacher trainee. The main focus of this course is to give students the opportunity to teach, to be evaluated as a teacher, and to exchange feedback on their teaching. The course is not only for those who want to be educators but who want to review their voice study.

- **Acting for Classical plays** (3)

Students will explore the world of classical characters and playwrights by acting and studying the text. The class explores the world of classical characters by working on texts of each era, sound and movement, monologues, and scenes.

- **Acting for Modern & Post Modern plays** (3)

Working on modern and contemporary plays in workshop setting, the class encourages students to explore various styles and approaches in acting for realistic and avant-garde theater.

- **Acting Pedagogy** (3)

The main focus of this course is to develop basic competence and qualifications required of theater educators. Students learn fundamentals in theater education, acting training and class management. Students are expected to utilize the opportunity to teach, to be evaluated as a teacher, and to exchange feedback on their teaching

- **Individual Studies** (3)

Each student is encouraged to find thesis subject and to have the opportunity to continue in-depth study on the subject on their own terms. Professors guide students to foster their research or creative work plan for the future.

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## Dept. of Physical Education

The department is pursuing true popularization of sport by clarifying the scientific methods and contents of sport as a social phenomenon, and also seeking an establishment of theories for fundamental investigation to understand the current sport. These will provide a capability for understanding the current situation, and practicing and viewing the sports in the near future. The newly formed perspectives will give opportunities for having enthusiasm and encouragement, and elevating talents by which individuals can practice and being a civilized human.

### ☐ Humanities and Social Sciences in Sports Major

The major offers master's, combined master's/doctoral, and doctoral degree programs and eight specialized research fields including; 1) Sport Ethics, 2) Sport Psychology & Sport Coaching, 3) Sport Pedagogy, 4) Adapted Physical Education and Activity, 5) Health Management, 6) Leisure & Recreation, 7) Sport Welfare & Sport Sociology, and 8) Sport Management & Sport Marketing. The program focuses on cultivating competitive researchers who have both theoretical knowledge and practical capability. Each fields emphasizes on studying general principles of humanities and social sciences in sport and physical education. The programs are designed to train independent researchers who are able to diagnose, analyze, and understand phenomena quantitatively and qualitatively in the areas.

### ☐ Natural Science in Sports Major

The major offers master's, combined master's/doctoral, and doctoral degree programs and five specialized research fields including; 1) Exercise Physiology, 2) Exercise Biochemistry & Nutrition, 3) Biomechanics & Sport Engineering, 4) Kinesmetrics in Kinesiology, and 5) Exercise Rehabilitation. All degree programs are oriented to a research intensive and competency-based with guiding of a major professor. The research fields emphasizes in developing broad perspectives and thoughts in natural science aspects of sport and exercise. The programs are designed to train independent research specialist through in depth research experiences.

### ☐ Courses

#### ☐ Core Courses

##### · **Sports Colloquium (3)**

The course is designed to invite respective speakers who can deliver stories and

background of selected topics. Diverse issues and agenda found in the field of sport, exercise, physical education, and human movement are covered. Topics are normally selected by instructors and students, and can be an issue of common interest in this field. Discussions after speech can be followed and students can broaden their knowledge and common sense in their major as well as adjacent areas.

- **Research methods in sport (3)**

To learn quantitative and/or qualitative research methods in exercise and sport sciences. The students can learn the critical and logical thinking to conduct the scientific researches. It will cover how to write the thesis and the articles to publish on the academic journals in the fields of Kinesiology.

- **Research-Learning Ethics (3)**

This course covers broad range of research-learning ethics in the field of kinesiology. Contents are the followings: introduction to research learning ethics, research misconduct, data management, authorship, human subject research ethics, learning ethics.

#### □ **Sport Ethics Field Major**

- **Understanding of Sport Ethics (3)**

This course examines ethical problems in sport and ways of discussing them. It helps you understand basic theories of moral philosophy in order to analyze ethically various questions posed in sport.

- **Studies in Sport Humanities (3)**

This course concentrates on major themes and issues in the studies of sport humanities. Through reading sport literature, sport history, and other various sport humanities texts, such as film, advertisement, and comics, this course is designed for acquiring basic concepts and methodologies in sport humanities.

- **Criticism on Sport Literature & Film (3)**

This course studies major critical theories and issues via sport literature and film. As you survey Realism, Modernism, Postmodernism, Formalism, Feminism, Marxism, and Cultural Studies, you will learn how to critique and write critically on sport literature and other visual texts, including film, advertisement, animation, and design.

- **Studies in the Philosophy of Sport (3)**

This course develops your understanding of the nature and methodology of philosophical studies on sporting phenomena, founded upon major thoughts in



Western philosophy. With an emphasis on understanding philosophical approaches to sport, this course helps you ask on your own philosophical questions on sporting phenomena.

- **Research Methods & Writing in Sport Ethics (3)**

This course provides theory and practice on conducting an academic project on sport ethics, from choosing a study object to completing a research paper. Students will learn how to plan on a sport ethics project, including determining types of study, drafting a research proposal, conducting a research, analyzing collected research materials, and writing a research paper.

- **Independent Study (3)**

Independent Study enables a student to pursue an individual research project of his/her own choice, guided by a faculty member.

- **Sport Psychology & Sport Coaching Field Major**

- **Studies in Sports Psychology (3)**

To make a diagnosis of reaction about people who are sports active by the scientific approach in athlete?athletic sports situation. This is applicable to athlete?athletic sports and psychology

- **Studies in Motor Learning & Control (3)**

Based on understanding a concept model of human performance, to study the human performance in variable circumstance such as physical joint, movement type.

- **Studies in Exercise Psychology (3)**

Studying motivation, emotion according to exercise and factor analysis of participation, adherence, drop?out for exercise.

- **Topics in Sport Psychological Skill (3)**

Learning the basic knowledge on sports psychological skill for improving performance of athlete, and applying even from life inside of the common person the psychological technique.

- **Topics in Sport Motivation & Emotion (3)**

Searching to possibility how to apply motivation and emotion of human in sports and understanding it.

- **Sports Psychology Field Study (3)**

The major purpose of the Sports Psychology Field Study is psychological thinking, emotion, behavior of human being in sports, exercise and other sports activities. Also this lecture will learn how to apply theory with in Field.

- **Sport psychology technology (3)**

Acquiring counseling ability to apply on field by Learning various counseling theory and actual skills for athlete.

- **Sport behavior mind analysis (3)**

Learning theories related sport behavior based on behaviorism and acquiring ability to apply field.

## ❑ **Sport Pedagogy Field Major**

- **Studies in Sports Pedagogy (3)**

Includes theory, research, and application of sports pedagogy associated with P.E.; analyzes theory and current research trend regarding sports pedagogy; concentrates on effective application of pedagogy to school, society, and professional areas.

- **Studies in Teaching P.E. (3)**

Aims assessing and analyzing research results related to teaching and learning P.E.; establishes an individualized perspective on teaching P.E. through the analysis of research themes and methods in teaching P.E.

- **Topics in Curriculum of P.E. (3)**

Starts from the basic assumption that curriculum of P.E. can be studied from different views of various fields of study; helps correct understanding of sports pedagogy through the self examination; enables the general prospect toward future development of educational practice.

- **Teaching Methodology in Physical Education (3)**

Explores various theories regarding effective style, technique, design, and application of teaching P.E.

- **Analysis & Critiques of Instruction in P.E. (3)**

Emphasizes a systematic analysis and educational critiques of instruction in P.E. (P.E. teaching); learns organized methods of observation and examines effective strategies for instruction in P.E.

- **Sporting Activity Programs Development (3)**

Understands design and organization principles of sporting activity programs and investigates their theoretical and practical applications according to the subject, location, facility, and major area.

- **Research Designs for Sports Pedagogy (3)**

- ① Review of research methods in sports pedagogy studies.
- ② Data collection, analysis, and interpretation.
- ③ Basic theories and techniques in statistics.

- **Qualitative Methods in Physical Education (3)**

Qualitative research methods have been used diversely in liberal, social, and science areas. This course overviews multilateral tradition of qualitative research focusing on a cultural analysis, introduces related theories, and offers preliminary experiences that can be applied to each individual research. The objective is to raise questions on phenomena and culture of traditional physical education and to explore its essence through qualitative research methods.

- **Adapted Physical Education and Activity Field Major**

- **Adapted Physical Education and Activity (3)**

This course is to introduce comprehensive knowledge in terms of specific composite elements in adapted physical education, such as definitions, history, and law. Also, this course focuses on providing knowledge on organization and management of adapted physical education programs. By introducing a variety of strategies for teaching and evaluation of adapted physical education programs, we have a goal to improve capacity as teachers and instructors in the field of adapted physical education.

- **Physical Education for Individuals with Intellectual Disabilities (3)**

As an advanced course of adapted physical education, this course is to provide knowledge on basic elements which teachers must know when teaching people with intellectual disabilities, such as reasons and characteristics of disabilities, effective teaching strategies, and various adapted sports programs for people with intellectual disabilities.

- **Physical Education for Individuals with Autism Spectrum Disorders (3)**

As an advanced course of adapted physical education, this course is to provide knowledge on basic elements which teachers must know when teaching people with autism spectrum disorders, such as reasons and characteristics of disabilities, effective teaching strategies, and various adapted sports programs for people with autism

spectrum disorders.

- **Physical Education for Individuals with Sensory and Physical Disabilities (3)**

As an advanced course of adapted physical education, this course is to provide knowledge on basic elements which teachers must know when teaching people with sensory and physical disabilities, such as reasons and characteristics of disabilities, effective teaching strategies, and various adapted sports programs for people with sensory and physical disabilities.

- **Independent Study (3)**

This course is to help students make a decision on the field they are interested by providing opportunities to study international and national research related to adapted physical education and activity. Through this course, we have a goal to improve understanding on research methods and to provide skills of how to selecting research topics they are interested.

❑ **Health Management Field Major**

- **Theory of Health (3)**

This course is designed to help students understand what health is, and study the conditions and general theories of healthy living. In particular, this course explores healthy behaviors, traits, and conditions necessary for healthy living from a physiological point of view.

- **Exercise Prescription (3)**

The aim of this course is to study basic principles required of exercise prescription. This course, especially, provides students with how to correlate various diseases and how to properly implement exercise prescription plans. It also focuses on exercise methods like; aerobic, anaerobic, flexibility based training and so on.

- **Functional Training (3)**

This course examines general theories and methodology of exercise in order to improve health. The course goes beyond conventional training and moves into more cutting edge training methods such as acceleration, pneumatics and so on.

- **First Aids (3)**

The purpose of this course is to teach students the coping and safety theories for crisis situations.

- **Public Health (3)**

This course focuses on the history and concept of public health. The course teaches students the necessary and sufficient conditions which lead to healthy adults of all ages as well as school bodies and their general well-being.

❑ **Leisure & Recreation Field Major**

• **Leisure Theories (3)**

Studying the relationship between theoretical studies and variables that define structure and effects of leisure.

• **Program Composition in Recreation (3)**

Theories and Practical studies of Creating Essential Recreation Program: Concept, composition, formation and design of recreation program.

• **Leisure Welfare Theories (3)**

This course is designed to explore the sociological functions of leisure activities in modern society and analyze various theories and their application to social phenomena from a social welfare perspective.

• **Survey Methods in Leisure & Recreation (3)**

Studying the basic concept, design of investigation, measuring, research design and data analyzing skill in Leisure and Recreation.

• **Seminar in Leisure and Recreation (3)**

This class explores the critical points of leisure studies by analyzing the current theories and research trends.

• **Therapeutic Recreation (3)**

The purpose of this course is to study theories of therapeutic recreation and develop the capability in order to apply therapeutic recreation service programs in real world settings.

❑ **Sport Welfare & Sport Sociology Field Major**

• **Topics in Sport Policy & Administration (3)**

Topics in Sport Policy & Administration deals with the roles of sport policy through the history of Korea and studies the process of sport policy in government.

• **Studies in Sport Sociology (3)**

It analyzes the various changes in sports and society into sociology and studies on the powerful relationship.

- **Topics in Sport Sociology (3)**

Sport Sociology offers a wide understanding related to its concept and range. Also sport and social organization will be investigated, examined, and discussed in the aspects of culture position and prospect.

- **Sport Welfare Administration (3)**

Sport Welfare Administration explores the concept of sport welfare as basic human rights which primarily encompasses social security, health and education in welfare society.

- **Studies in Sport Welfare Practice (3)**

Studies in Sport Welfare Practice provides a comprehensive guide to the practical application of sport welfare at community level.

- **Research Methods in Sport Welfare (3)**

Research Methods in Sport Welfare examines analytical methods for sport welfare studies and develops practical methods for resolving social problems.

- **Sport and Contemporary Society (3)**

Today it analyzes the relationship of direction of a ceremony and sports positively and it researches.

- **Topics in Politics-Economics & Sport (3)**

It carries out a deep political study relates to sports, national health, and spare time, etc.

- **Sport & Mass Media (3)**

The society of today the Internet, the television and the newspaper, that the various mass media of magazine etc. is speaking all social phenomena, is not the chart overstatement, there is to a sports field and it stands but it is the same. It examines the relationship of like this mass media and sports, it researches the importance.

- **Individual Researches for Sport Sociology (3)**

Individual Researches for Sport Sociology is designed to address specific issues in the filed of sport and complement intensive research as an individual.

❑ **Sport Management & Sport Marketing Field Major**

- **Sport Management (3)**

Study the roles of sports manager in sport industry by studying theories of management and essence of sports and learn the practical sports management knowledge by applying management theories and concept based on the principles of sports and its system.

- **Sport Marketing (3)**

Study the practical sports marketing knowledge and strategies by applying basic marketing theories and sports principles and understand the various roles of sports marketing in the sports industry.

- **Sport Sales & Promotion (3)**

Provide theoretical understandings of sports sales and promotion and illustrate various applications with practical examples and testimonials from the sports marketplace.

- **Sport Management Information (3)**

Understand the needs of information technology in sports management and t, the structure of organization study the information system and application of computer system to analyse and apply various data and information regarding sports management.

- **Research Methodology in Sport Management (3)**

Develop the skills of creating various research topics and practice the research works by studying basic concepts and methodology of sports management research.

- **Sport Economics (3)**

Understand various economic theories and affairs which occur in connection with sports and enhance the abilities to apply and adapt basic economic principles in sports industry.

- **Sport Consumer Behavior (3)**

Sport Consumer Behavior Theory is about understanding related to Watching and participating sport consumers' properties, sport participating decision making process and various internal, external, situational elements' concepts and interactive principles in Sport Consumer Behavior's meaning extent.

- **Sport Facilities Management (3)**

Sport Facilities Management Theory is including understanding related to Sport Facilities' roles and functions in Sport Industry, at the same time, pursuing ability that

can plan and manage efficient, effective Sport Facilities on the basis of that understanding.

- **Sport Public Relations (3)**

Sport Public Relations Theory is about understanding related to P.R's role and importance in Sport Industry. Especially, this Theory is for studying the relationship of Sport Organization and Mass media, of Sport Organization and a local community. Sport Public Relations Theory is pursuing the ability that can guide the general public's recognition to positive on the basis of that studying.

- **Sport Event Planning (3)**

Sport Event Planning Theory is meaning the understanding related to Sport Event's concept, variety and marketable element coming from Sport Event's concept, variety. This Theory is for acquisition of ability that can efficiently plan, perform and manage Sport Event.

- **Sport & Law (3)**

Trying to learn about the basic knowledge of sports law, researching the domestic and foreign sports law, studying condition of sports are considered a legal cases for studying the lawful problem.

## ❑ **Exercise Physiology Major**

- **Exercise Physiology (3)**

Studying diverse physiological phenomenon occurring in human body while exercising and performing physical activities. In particular, establishment of knowledge regarding cardiovascular, neuromuscular, and metabolic responses during exercise will be focused.

- **Laboratory Technique in Exercise Physiology (3)**

Various experimental methods and strategies for exercise physiology and movement sciences will be acquired and scientific bases and practices in cardiovascular, muscular, body composition, and physical fitness testing will be discussed.

- **Training Methods (3)**

Learning the efficient training methods based on combined knowledge of exercise physiology, biomechanics, and sports psychology. Based on the scientific knowledge, improving techniques for practical application in systemic training schedule and progress, diagnosis, evaluation, and prescription.



- **Metabolism in Exercise (3)**

Energy supply system, energy utilization, and energy efficiency during exercise will be focused. Carbohydrate and lipid metabolism as well as protein utilization during exercise will be discussed.

- **Environmental Physiology (3)**

How the environmental changes can affect physical capacity during exercise will be examined. The effect of changes of environmental factors such as heat, cold, altitude, weightlessness, wet, dry, time difference, day and night, and pollutions on human physical capacity will be focused.

- **Cardiorespiratory Function & Exercise (3)**

The basic mechanisms of cardiovascular and respiration system will be focused. Responses of cardiovascular and pulmonary functions during and after exercise will be discussed. The short and long term effects of exercise and training in these systems will be also handled. Additionally, exercise training and/or intervention for athletes, patients as well as minorities will be discussed.

- **Data Analyses in Exercise Physiology (3)**

This promotes an understanding the nature of variables frequently evaluated in exercise physiology and examines the relationships among variables. Based on these, this class elevates the capacity of optimal analyses and of drawing proper conclusion of a data set.

- **Exercise and Health Promotion (3)**

This class studies the impact of exercise on fitness and health promotion and a preventive role of exercise. This class evaluates how the knowledge in exercise physiology can adopt to average population in real life.

- **Exercise Biochemistry & Nutrition Field Major**

- **Muscle Metabolism in Exercise (3)**

To understand the mechanisms of exercise-induced muscle damage and acquire knowledge about myogenesis and protein synthesis for muscle regeneration.

- **Carbohydrate Metabolism in Exercise (3)**

To acquire knowledge about carbohydrate intake and metabolism during exercise and discuss recent issues about carbohydrate supplement to improve exercise performance and health benefits.

- **Lipid Metabolism in Exercise (3)**

To understand pros and cons of fat loading for exercise performance and acquire knowledge of the effect of fat intake on health.

- **Dietary Supplements in Exercise (3)**

To understand the effects and function of dietary supplements including antioxidants, vitamin, and minerals during exercise and discuss recent research regarding pros and cons of dietary supplement for exercise performance.

- **Exercise Immunology (3)**

To acquire knowledge about immune function during exercise and the effect of regular exercise on immune function, and understand factors for activation and inhibition to immune function related to skeletal muscle injury.

- **Nutritional Plan and Application in Exercise and Sports (3)**

The aim of this course is to learn proper nutrients essential to various sport event and to design dietary plan for athletes based on their event.

- **Research in Exercise-induced Injury (3)**

The aim of this course is to learn the etiology of musculoskeletal injuries and its symptoms and diagnosis during exercise and to discuss healing process in soft tissue as well as hard tissue based on the current studies.

- **Nutrition & Biochemistry in Exercise (3)**

To acquire knowledge about digestion, absorption and metabolic pathway of food intake and about mechanisms for energy metabolism during exercise.

- **Biomechanics & Sport Engineering Field Major**

- **Sport Biomechanics (3)**

Studying principle and application of biomechanics in exercise and sport

- **Biomechanics for Musculo-skeletal system (3)**

Studying functional anatomy of human musculoskeletal system and biomechanical principle

- **Clinical Biomechanics (3)**

Research in clinical biomechanics and case study in medical diagnosis and rehabilitation of patients

- **Research Method in Biomechanics (3)**

Studying various experimental equipments and data processing in biomechanical research

- **Gait & Motion Analysis (3)**

Studying gait analysis for cerebral palsy and lower extremity patients and movement analysis for various sport technique

- **Computer Programming for Biomechanics (3)**

Studying computer interface and computer programming such as Visual Basic, Labview and Matlab for biomechanical research

- **Mechanics of Sport Equipment (3)**

Studying mechanical principles and its application to the sports equipment

- **Sport Engineering (3)**

Studying design, product and test for sports products & equipment and information of sports engineering and practical application

□ **Kinesmetrics in Kinesiology Field Major**

- **Classical Test Theory in Health and Kinesiology (3)**

The object of this course is to learn how to find the validity and reliability evidences of measures in Health and Kinesiology based on the classical test theory.

- **Item Response Theory in Health and Kinesiology (3)**

This course covers how to conduct the researches employing the item response theory in Health and Kinesiology disciplines.

- **Advanced Statistics in Kinesiology I (3)**

In this course, theoretical framework of advanced statistics in the social behavior disciplines of Kinesiology, which will include factor analysis, confirmatory factor analysis, path analysis, and structure equation modeling. Also, the advanced statistical packages(e.g., ITEMAN, AMOS, SPSS, SAS, M+, etc.) using the real data sets in the researches will be practiced.

- **Advanced Statistics in Kinesiology II (3)**

Advanced statistics related to Exercise Sciences and Kinesiology focusing on the researches involving with the experimental designs, interventions, and small sample

size. It covers multiple regression, multi variate analysis of variance, non parametric data analysis, so and forth.

- **Experimental Design in Kinesiology (3)**

It will be covered designing the research experiments in the umbrella disciplines under Kinesiology(e.g., randomized and fixed factorial designs, hierarchical designs, etc.) and practicing how to select appropriate statistics of the experimental design.

- **Research Methods in Kinesiology (3)**

Basic steps of publishing an academic article related to Health and Kinesiology area will be practiced. It includes how to find research ideas, to read references, to develop a manuscript, to review a manuscript submitted to an academic journal, and to response to the reviewers.

- **Physical Activity and Epidemiology (3)**

General knowledge and practice in Epidemiology of physical activity will be covered including literature review, research methods, statistical approaches, and development of a manuscript.

- **Current Issues of Measurement related Researches in Health and Exercise Sciences (3)**

Current research issues in the measurement in Health and Kinesiology will be discussed and research ideas will be developed based on the discussions.

- ❑ **Exercise Rehabilitation Field Major**

- **Evidence Based Sports Medicine (3)**

Students will learn about the evidence based treatment, rehabilitation, and injury prevention strategies for the common sports injuries and discuss the qualities of the evidence obtained from biomedical research.

- **Current Trends in Exercise Rehabilitation Research (3)**

This class introduces the current trends of research being conducted in athletic training, strength training and conditioning field and discusses the details of the research.

- **Fascial Line Theory (3)**

The structures and functions of the fascia that transmits and controls muscle force during movements and sports and how the facial line affects daily life and sports performance through each of the fascial line will be discussed.

• **Science in Strength Training and Conditioning (3)**

The class will explore the scientific mechanisms and detail methods of strength and conditioning programs that are commonly implemented in the sports field. The effectiveness of the training methods will be also discussed in the class.

• **Neuromuscular Function (3)**

The class will help students review the anatomical neuromuscular structures and functions, and understand the characteristics of the neuromuscular system that plays significant roles in exercise rehabilitation and sports performance.

• **Therapeutic Exercise (3)**

Therapeutic exercises designed to facilitate healing process and restore functions after acute, chronic musculoskeletal disorder and common sports injuries will be introduced. Students will also learn about the mechanisms of each exercise program and the detail exercise protocols.

• **Athletic Training Research (3)**

This class will help students to understand the research trends in the athletic training field by reviewing the recently published studies in athletic training related journals.

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## **Dept. of Xcultural Studies**

Due to the fact that the administration of this cooperative course is based on the cooperation of professors who have similar ideals and interests and the cooperation of related majors, students are able to step outside the boundaries of their own major and take advantage of the available resources to the fullest. Also, by strongly encouraging cross registration of credits and the involvement of professors from other universities, the program's sound and practical quality of education is unparalleled to any other universities that offer a single subject graduate school program.

The Xcultural phenomenon that this program is based on is a phenomenon that occurs all around us without our knowing. Therefore, various major fields that are involved with our lives participate in this cooperative program, with the belief that academic subordination is inevitable without introspection of "our lives" and that true globalization can be achieved only when "our lives" and "their lives" combine and form the "life world."

The curriculum for individual students can be composed freely while sharing the above mentioned points in prospective. The curriculum will be selected and developed with the help of the advisor according to each student's interest. Also, in order to widen the platform of the shared interest, the effort to develop research methods and acquire practical techniques will simultaneously be carried out.

### ☐ **Courses**

#### ☐ **Core Courses**

- **Studies of the Xcultural Theory (3)**

"Modernism" in the studies of humanities and social science forms a paradigm. However, various problems arise from applying identical standards to the East and West without being aware of the relativity. Based on this understanding, we will examine the existing theories of arts, humanities and social sciences related to the Xcultural phenomenon and search for the possibility of an alternative theory.

- **Characteristics of Eastern and Western Thoughts (3)**

- **Theories and Methods in Cultural Studies (3)**

- **Seminar in Western Cultural Theories (3)**

In this class, students will master anthropology and traditional cultural approach comprehensively and acquire relevant analytical techniques and ability.

- **Seminar in Eastern Thought Traditions (3)**

In this class, students will get a glimpse of the thinking process that has been commonly practiced in the East, from ancient to modern times, and also examine how this affects modern day life and thought processing.

- **Seminar in Western Thought Traditions (3)**

In this class, students will get a glimpse of the thinking process that has been commonly practiced in the West, from ancient to modern times, and also examine how this affects modern day life and thought processing.

- **Readings in Eastern Classics (3)**

This course interprets Eastern classics from the Xcultural perspective.

- **Readings in Western Classics (3)**

This course interprets Western classics from the Xcultural perspective.

- **Phenomenology and Xcultural Studies (3)**

This course conducts a phenomenological approach to the phenomena of confusion, the loss of meaning and doubling and others.

- **Hermeneutics and Xcultural Studies (3)**

- **Xlogical Understanding of Current Social Problems (3)**

As students review the visual materials dealing with various social problems, they are trained to see the troubles consistently stemming from the betrayal of emotional logic in people's thinking, and to get ready for applying the logical thinking to theory evaluation and fieldwork.

- **Special Topics in Xcultural Studies (3)**

To capture the field of culture-crossing, this course review authors, periods, writings, and others.

- **Social Culture Scape (3)**

Architecture is social and cultural complex. This course depicts our cities from the perspective of the culture scape.

- **Team Teaching in Xcultural Studies (3)**

Scholars from various disciplines cooperate to analyse and evaluate current issues from the Xcultural perspective.

- **Adoption and Hybridization of Foreign Culture (3)**



- **21C Cultural Trends (3)**
- **Quantitative Research Method (3)**
- **Qualitative Research Method (3)**
- **Independent Study (3)**
- **Workshop (3)**
- **Understanding Classics (3)**
- **Science of Feelings (3)**
- **These Research (3)**
- **Building Urban Villages (3)**
- **Education through Work and Play (3)**

- **The Flow of Thinking in Modern Korea (3)**

Assuming that different thinking harbors different behavior, we review various materials containing people's thinking in modern Korea. In this process, we find out how people's thinking affects their behavior, and distinguish between right and wrong.

- **Seminar in Discourses on Culture (3)**

In this class, we examine meanings of culture accepted in cultural studies and daily life. In this process, we find out that arguments about cultural phenomena such as imitation, convergence, coexistence, and crash stem from improper understanding about culture, and inquire into the proper meaning of culture.

- **Aesthetics in the East and the West (3)**

The East and West alike, the Aesthetics is divided into two types: One states that feelings of all artists are perfect; the other claims that feelings of all artists are imperfect. In this class, we will compare the two Aesthetics and help the students to understand the differences.

- **Cultural Studies and Writing (3)**

We think the problems of writing in current academics and explore the practice

of writing(of a research paper) in Cultural Studies. We examine how the researchers('I') present their self-reflexivity and understanding of research perspective.

#### ❑ **Cultural Study of Politics Major**

- **Xcultural Approach to Korean Politics (3)**

This course probes the relevance of the Western political thoughts and institutions in Korean cultural horizon.

- **Dualism in Asian Regionalism (3)**

Under the understanding that the concept of region in Korea and Asia exists in a dual structure that consists of a political region and a cultural region, students will examine its formative process and its modern day meaning.

- **Korean Political Thought and Reality (3)**

- **Critical Evaluation Development Theories (3)**

- **Xcultural Ethics (3)**

Xcultural Ethics originates in Plato and Mencius' teachings, and Science of Emotion founded by Spinoza's Ethics and Toegye's Holy Learning exists as the apex of it. The core of Xcultural Ethics is to learn and think the true understanding of emotion which is common to the West and the East. Xcultural Ethics is Science of Emotion.

#### ❑ **Cultural Study of Arts Major**

- **Design and Culture (3)**

This deals with the theories and practices of design, focusing on culture as a design element.

- **Cultural Approach to Living Space (3)**

This course analyses functional and dysfunctional cultural adaptations in living space construction.

- **Social History of Arts (3)**

- **Developing Culture Contents (3)**

Finding cultural elements in our life-world, this course explores the ways to apply

them in developing cultural contents.

- **Narrative and Cultural Studies (3)**

In the age of the culture and story, we share the importance of narrative thinking and pay attention to the effect of mind in narrative communication.

- **Cultural Socio-psychology Major**

- **Cultural Psychology (3)**

This course attempts show how culture affects self-concept, social concept, motivation and ethics.

- **Religion at the Crossroad of Cultures (3)**

Religion as Culture is the focus of interest in this course.

- **Critical Evaluation of Modernism and Postmodernism (3)**

This course critically review the Modern and Postmodern Philosophies from the Xcultural perspective.

- **Culture and Pedagogy (3)**

Assuming that different cultures and traditions harbors different educational goals and methods, this course attempts to understand how traditional educational practices affect the current education in Korea.

- **Theories on Education (3)**

The educational theory on illustrious virtue(明德) is departed from our flawless nature-being what Heaven has conferred. An accordance with this nature is called Instruction. We will compare this theory with Hermeneutical Education to dispute the differences.

- **Cultural Korean Studies Major**

- **Seminar in Korean Culture (3)**

This course helps to understand the Korean identity from the Xcultural perspective.

- **Seminar in Korean History: Fragmentation and Continuity (3)**

Knowing that the emphasis of the fragmentary nature of Korean history does not help understand the identity of Korean society, this course approaches from the

perspective of continuity to relive the lives of Korean past.

• **Topics on Korean Literary Thoughts (3)**

By reviewing writers, their works and reviews, students will examine the change of ideology and style of adaptation of Korean literature that were influenced by modernization.

• **Topics on the Changing Asian Interrelations (3)**

Focusing on the fast growing interrelations among Asian countries, this course reconstructs the meaning of this exchanges from the Xcultural perspective.

• **Seminar in an Asiatic Mode of Change (3)**

By comparing the development a list view of history and the circulative view of history, students will examine the unique characteristic that is embodied in the transformation of Asia.

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## **Dept. of Financial Information Security**

Department of Financial Information Security offers an excellent education and interdisciplinary cutting-edge research programs to train future leaders and innovators in information security of financial services industry. Faculties from the fields of mathematics, management information system and business administration provide a broad range of courses and joint research projects in partnership with academia and industry.

### ☐ **Information Security Major**

Information security major focuses on producing researchers and specialists in privacy protection, protection against hacking, information authentication, and technology evaluation for information security, etc. Our program trains future leaders and innovators in information security by offering an excellent education and cutting-edge research projects.

### ☐ **Financial Security Major**

Financial security major focuses on producing researcher and specialists in managing and protecting financial big data, legal and institutional aspects of financial information security, consumer-oriented financial services and e-Discovery, etc. Our program trains future leaders and innovators in financial security by offering an excellent education and cutting-edge research projects.

### ☐ **Courses**

#### ☐ **Core Courses**

#### ☐ **Information Security Major**

- **Information Security Protocols (3)**

This is an introductory course for financial information security. After providing brief reviews for cryptographic algorithms, the course covers several topics in protocol including key distribution, secret sharing, authentication, and zero-knowledge protocol.

- **Financial Information Security (3)**

We study the information Security Technology in Financial Field, such as Electronic cash, Secure Electronic Transaction, and Internet Banking Systems, etc.

- **Research Ethics & Thesis Study (3)**

This course provides an overview of methods used to conduct and evaluate research. This course will include discussion on the scientific method, development of research questions, exploration of literature, formulation of research designs, and professional critique of

methodologies. Also, ethical issues in research are discussed.

- **Cryptographic Algorithm (3)**

We study classical cryptography and modern cryptography such as stream ciphers and block ciphers based on Shannon theory.

- **Hash Function and Message Authentication (3)**

This course covers the design principle of collision-free hash functions and message authentication codes which can be used in digital signatures.

- **Cryptanalysis of Public-key Cryptosystem (3)**

This course covers the cryptanalysis of public key cryptosystem based on the mathematical methods such as factorization of numbers, discrete logarithm problems.

- **Topics in Symmetric Key Cryptanalysis (3)**

This course covers the cryptanalysis of symmetric key cryptosystem such as stream ciphers and block ciphers.

- **Parallel Implementation of Cryptographic Algorithms (3)**

This course provides a systematic approach to parallel implementations of cryptographic algorithms. Topics include a brief introduction to computer architecture and operation system. Particularly, parallel computing with GPU will be considered in depth.

- **Evaluation and Validation Techniques for Cryptographic Modules (3)**

This course is an introductory guide for developers who build cryptographic modules. Mandatory standards for cryptographic modules including ISO 19790, 24759, and FIPS 140 will be considered. Students are supposed to understand CMVP(Cryptographic Module Validation Program) in US and Korea and related policies. Also, techniques for security evaluation will be studied.

- **Side Channel Attacks (3)**

This course covers any attack based on side channel information such as timing information, power consumption, electromagnetic leaks or even sound gained from the physical implementation of a cryptosystem, rather than brute force or theoretical weaknesses in the algorithms (compare cryptanalysis).

- **Countermeasures of Side Channel Attacks (3)**

This course provides secure S/W and H/W cryptographic design and implementations against side channel attacks. The countermeasures fall into two main categories: (1) eliminate or reduce the release of such side channel information; and (2) eliminate the relationship between the leaked information and the secret data.

- **Security Implementation Methodology (3)**

This is a practical guide for implementing security functions. Based on the understanding of

cryptographic algorithms, students are required to build an application as a group project and learn how to protect their software from malicious attacks by removing potential vulnerabilities.

- **Introduction to PKI (3)**

The goal of the course is to provide an introduction to PKI (Public Key Infrastructure) and relevant technologies including public key encryption, authentication, and digital signature. As an application, we study how to apply PKI to financial services.

- **Mobile Security (3)**

We study the latest mobile networks security architecture and technology.

- **Wireless Security (3)**

We study the latest wireless communications technology and the security technology of the applications.

- **IT Convergence and Security (3)**

We study Convergence Technology on IT field and other fields, and the security technology of the applications.

- **Information Security Policy (3)**

We study the management and the policy of information security. We study the management methodology that can supplement the limit of information security techniques.

- **Information Security Consulting (3)**

This course is a field that focuses on advising IT businesses on how best to use information technology to meet their business objectives. To providing advice, we study how to estimate, manage, implement, deploy, and administer information security products or the IT security related organization about security level, vulnerability, policy, standard, and monitoring process.

- **Information Security System Evaluation Methodology (3)**

This course covers evaluation methodology for information security systems. To understand conformance tests, we refer testing methodology in CC (Common Criteria), CMVP(Cryptographic Module Validation Program), and PIV(Personal Identity Verification).

- **Analysis and Implementation of Security Technical Standards (3)**

This course has two main goals. One is understanding of standardizations of security techniques and the other is having ability to build systems based on the standard techniques. We refer standard documents by ISO/IEC, IETF (Internet Engineering Task Force), ITU-T. Students are supposed to be familiar with standards and applying them.

- **Digital Forensic (3)**

We study the forensic science encompassing the recovery and investigation of material found in digital devices such as personal computers, notebook computers and cellular phones, often in relation to computer crime.

- **Financial Device Hacking (3)**

The goal of the course is how to seek and exploit weaknesses in financial devices such as PC, smart phone, smart card, Micro-SD, OTP and so on. And then we study some countermeasures which are secure against these attacks.

- **Advanced Information Communication Theory (3)**

It aims to educate about the ubiquitous network and context awareness and localization that are the core technologies of computing. It provides information on various application systems including context-awareness / localization, and ubiquitous network architecture, requirements of ubiquitous network, etc.

#### ☐ **Financial Security Major**

- **Model-based System Design (3)**

This course is an introduction to model-based system design with domain specific and domain independent aspects. The metamodeling concepts are introduced for various information systems, and hybrid systems such as cyber physical systems. From the fundamental system design with UML up to metamodeling system design will be covered. The object programming language is used to implement the design process.

- **Data Mining (3)**

Data mining is concerned with the extraction of novel knowledge from large amounts of data. This course introduces and studies the concepts, issues, tasks and techniques of data mining. Topics include data preparation and feature selection, association rules, classification, clustering, evaluation and validation, scalability, spatial and sequence mining, and data mining applications.

- **Data Management (3)**

This course is concerned with the use of Database Management Systems (DBMS) to solve a wide range of information storage, management and retrieval problems, in organizations ranging from large corporations to personal applications, such as research data management. The course combines the practical aspects of DBMS use with more theoretical discussions of database design methodologies and the "internals" of database systems.

- **Intellectual Property and IT Patent (3)**

This course focuses on promoting the global mind on intellectual property among the



university students by studying IP education course. The fundamental concepts of intellectual property such as patent, trademark, industrial design, and patent information are covered, and the impact of IP on international trade also studied in the perspective of business domain and IT applicable domains.

- **Auditing (3)**

The aim of this course is to introduce students to the basic concepts of auditing and their application in the functional areas in an organization.

- **Financial Management (3)**

An introduction to advanced concepts and methods of financial management. Topics include risk and return, asset evaluation, capital budgeting, capital structure, business financial planning and working capital management

- **Financial Institutions (3)**

This course focuses on financial institutions, and will cover both markets and intermediaries. We will examine the structure of debt, equity and derivatives markets, as well as specific financial instruments traded on these markets. In addition, we will study financial intermediaries such as commercial and investment banks, mutual funds and insurance companies in order to develop a critical awareness of the risks faced by these institutions.

- **Statistics for Financial Analysis (3)**

This course deals with statistical techniques related to financial analysis. The techniques include probability & sampling distributions, estimation, hypothesis testing, linear and nonlinear regression, experimental design, modern business decision theory.

- **Financial Engineering (3)**

This course is the design, development and implementation of innovative financial products and financial processes in the major segment of equities, currencies, interest rates and commodities for trading investment hedging and complete risk management.

- **Principle of Entrepreneurship (3)**

This is an introductory course focusing on the individual entrepreneur, the generation of innovative business ideas, the creation of business ventures, and the role of entrepreneurship within society.

- **Practice of Entrepreneurship (3)**

This course is aiming to inspire students and provide them with the entrepreneurial skill and confidence needed to put plans into action. Students gain a full understanding of the practice of entrepreneurship through exposure to the experience of successful entrepreneurs and are given a solid understanding of the realities of business start-up.

- **Entrepreneurial Finance (3)**

This course examines the elements of entrepreneurial finance, focusing on technology-based

start-up ventures and the early stages of company development.

- **Strategic Management of Technological Innovation (3)**

This course examines certain fundamentals of enterprise success as derive from the strategic management and innovative deployment of technology - with particular emphasis on the ICT sector.

- **Strategic Management (3)**

This course covers topics of mission, goal, strategy formulation, strategy implementation and strategy evaluation. Strategic techniques include Industry: Analysis, Analysis of the Competitive Environment, Key Success Factors, Strategic Scenario Analysis and SWOT Analysis. Additional topics covered include strategic thinking, competitive advantage, vertical and horizontal integration, and planning horizon.

- **Entrepreneurship in Financial Information Security**

This course focuses on the industry structure, especially the barriers to potential entrants and competition, and market characteristics in the area of financial information security. The course also provides the analysis of successful startups, which allows students to design appropriate business model for their potential entrepreneurial opportunity.

- **IT Audit Technique (3)**

We study an information technology audit, which is an examination of the management controls within an Information technology (IT) infrastructure. It covers IT audit process such as planning, studying and evaluating controls, testing and evaluating controls, reporting and follow-up. The evaluation of obtained evidence determines if the information systems are safeguarding assets, maintaining data integrity, and operating effectively to achieve the organization's goals or objectives.

- **Business Data Communication (3)**

This course is about the fundamentals of data communications and networking. We will discuss information representation, network topologies, transmission medium, OSI model and TCP/IP networking models, and mainstream LAN and WAN technologies. The OSI model is used as a framework to organize and discuss the network technologies. The technical and managerial aspects of data communications and networking are both emphasized.

- **Cloud Computing (3)**

This course introduces the fundamental technologies and issues in this cloud computing environment. In terms of everything as a Service in cloud computing service, we learn main considerations in SaaS (Software as a Service), PaaS (Platform as a Service), IaaS (Infrastructure as a Service), and the related technologies. Students learn concepts and applicable areas of infrastructure system of cloud computing and VM provisioning via cloud environment. Also we will study the trends of enterprise cloud adoption, application integration, and various service provider and application to form the cloud service.

- **Big Data Infrastructure System (3)**

This course provides the fundamental concepts and knowledge of distributed system and middleware technologies for Big Data Infra system architecture. To understand IT infrastructure of Big Data processing, this course gives a lesson about the Hadoop Distributed File System and Map Reduce technique for storing and processing big data. Also, the recent IT evolution of conventional infra system of the Big Data domain and applications is introduced. Distributed systems, middleware, Hadoop Ecosystem, infra technologies, and IT service architectures are covered.

- **Financial Accounting (3)**

Financial Accounting provides an introduction to the concepts and uses of financial accounting information in a business environment and its role in the economic decision-making process.

- **Managerial Accounting (3)**

This course examines the principles, techniques, and uses of accounting in the planning and control of business organizations from a management perspective.

- **Analysis of Financial Report (3)**

This course emphasizes the fundamental techniques of financial statement analysis. Building upon core accounting and investment concepts, the course covers the analysis (including ratio analysis) and interpretation of financial accounting information including the balance sheet, income statement, and statement of cash flows.

- **Investments (3)**

An examination of investment markets, transactions, planning and information. Topics include investment risk and return measures, debt and equity instruments, evaluation techniques, hybrid and derivative securities, mutual funds, real estate investments, tax planning and the investment process, and portfolio management.

- **Research Methodology in Finance I (3)**

This course is an introduction to empirical methods commonly employed in finance. The course is organized around empirical papers with an emphasis on econometric methods.

- **Research Methodology in Finance II (3)**

This course will introduce students to the time series methods and practices which are most relevant to the analysis of financial and economic data.

- **Risk Management Seminar (3)**

This course focuses on theories and real-life cases of risk management in corporations and financial institutions.

- **Derivatives (3)**

In this course, students develop an understanding of financial derivative instruments and their applications to corporate strategy and risk management.

- **Introduction to Payment and Settlement System (3)**

This course covers legal and institutional infrastructure related to payments and settlements, potential risks of this system, and how to manage the risks.

- **Operational Risk Management (3)**

This course focuses on the risks arising from the people, systems and processes through which a company operates. It also include other classes of risk, such as fraud, legal risks, physical or environmental risks.

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## Dept. of Secured Smart Electric Vehicle

As an effort to address technical demands and issues from rapidly changing future societies and to lead the creatively integrated technical industries, Department of Secured Smart Electric Vehicle has been established since september 2013, to educate topic oriented engineers. More specifically, the department targets to cultivate engineers with thorough understanding of IT security and smart electric vehicle with the grant of BK21 plus for the education of target-oriented engineers from the government. As of March 2014, 8 full time professors are leading the department to educate 7 Ph.D. and 19 M.S. students to become the specialist in the field of secured smart electric vehicles. With the strong relationship with Hyundai-Kia Motors, Hyundai Mobis and many other tier 1 and tier 2 companies, many research topics related to security enhances electric vehicle systems are pursued in the department. 3 out of 8 full-time faculties are specializing in the automotive engineering and the rest are specializing in the electronic and in the computer engineering. Furthermore, some members of the faculty have successfully implemented the integrated solution of a battery swappable smart electric bus and with this experience from the industrial applications, it is strongly believed that the department has a full capacity of educating graduate students with industry oriented solution approach.

### ☐ Courses

#### ☐ Core Courses

- **Power System Control (3)**

Characteristics of power system will be introduced and the related fundamentals will also be provided. Furthermore, various operation and management strategy for the power system control including economic load dispatch, unit commitment, state estimation, voltage control, frequency control and stability analysis and more.

- **Control and Applications of Electric Machines (3)**

Fundamentals and applications of electric machines are discussed. Initially, theory of electric energy conversion is introduced to understand the function of transformers and electric machines. Secondly, most popular electric machines such as AC synchronous motor and induction motor will be studied in detail and finally the control algorithms for the rpm and torque of the machine utilizing power inverters with PWM control with axis transformation system.

- **Understanding of Information Security (3)**

Basic concept of information security will be discussed and the advanced theory will also be introduced. Symmetric key algorithm, hash function, MAC technique, Public key system, digital signature, key management techniques will be discussed.

- **Understanding of the Principles of Electric Vehicles (3)**

Fundamentals of the electric vehicle structures and core components are explained in this course. Prior to the discussion of secured smart electric vehicles, solid understanding of the electric vehicle will be achieved.

- **Electric Vehicle Control Engineering (3)**

Based on the fundamentals of control theory, system analysis of the electric vehicle will be discussed and the control algorithm for the analyzed electric vehicle will be detailed.

- **Knowledge of some kind of Communication (3)**

Fundamentals of M2M and IoT will be introduced to understand the core concepts and furthermore, new trends for the M2M, IoT will be discussed.

- **Vehicle Sound and Vibration (3)**

In this class, noise and vibration sources of vehicle are found out and various kinds of control methods are treated to decrease their levels through the objective and subjective evaluation. In addition, sound design and vibration reduction technique considering human perceptual feelings are studied.

- **Smart Electric Vehicle System (3)**

Advanced functionality in the smart electric vehicle systems and the core components are discussed in the lecture. Further applications and future of the smart electric vehicles are also detailed.

- **Charging System for Smart Electric Vehicle (3)**

Battery charging systems, battery exchange system, battery management system and communication protocols for the smart charging architectures are introduced and detailed.

- **Security System for Smart Electric Vehicle (3)**

Enhanced security systems for the internal and external communications of the smart electric vehicle will be introduced. Various possibilities will be further discussed in the lecture.

- **Information System for Smart Electric Vehicle (3)**

Information exchange systems for smart electric vehicles such as vehicle to vehicle connection, vehicle to infrastructure networks are introduced and discussed to evaluate the pros and cons of various information sharing technologies.

- **Secured Smart Electric Vehicle System (3)**

In order to prevent hacking of the vehicle control systems, various security systems have to be implemented in the secured smart electric vehicle systems. Especially for the system which directly controls the brake system, electric machines, higher security level is required. In this

course, various ideas and techniques will be discussed to achieve the higher security levels for the smart electric vehicle operation.

- **Charging Infrastructure for Secured Smart Electric Vehicle (3)**

In this course, charging facility, communication system, central operation of the facility management including fee collection methods for the electricity used for the smart electric vehicle charging will be generally discussed. Future technologies for the advanced charging infrastructures will also be introduced.

- **Information Security System for Secured Smart Electric Vehicle (3)**

Specialized security enhancement for the smart electric vehicles will be discussed and the related security encoding algorithms will be introduced and trained.

- **Linear Control System (3)**

In order to understand the linear system modeled based on the state-space model of modern control theory, stability of the model, pseudo controllability, pseudo observability will be introduced and discussed. Based this understanding, optimum control and observational design will be studied through examples of successful applications.

- **Embedded Linux System Programming (3)**

Several considerations on implementation of embedded system based on Linux operation system are discussed. Programming techniques for embedded systems using Linux system calls are studied.

- **ECU Design (3)**

Fundamentals of ECU(Electronic Control Unit) design and ECU Hardware/Software design techniques are studied.

- **Advanced Topics on Transportation Infrastructure (3)**

This subject will demonstrate the development trends of transportation infrastructure; and discuss modernization of transportation and technical factors that should be considered when planning transportation infrastructure.

- **Transportation Planning for Smart Electric Vehicle (3)**

Transportation planning and applied research in related technologies regarding provision of safe and efficient driving environment for smart electric vehicle.

- **Vehicle Network System (3)**

Vehicle network system is a automobile-IT convergence technology, which wireless



communication network combined with vehicle. The vehicle network technology provides vehicle safety and diagnostics, telematics, ITS and other services. This course goes to training for vehicle communication network technology. Details educational contents is as follows: One is a In-Vehicle Network technologies including LIN(Local Interconnect Network), CAN(Controller Area Network), FlexRay. And the other is Vehicle-to-Vehicle Network and Vehicle-to-Infrastructure Network(V2I) technologies based on Wireless Access In Vehicle Environments(WAVE), Dedicated Short-Range Communications(DSRC), Wireless Personal Area Network(WPAN), and so on. Additionally, study networking technologies for autonomous driving based on the previously learned vehicle network technologies.

- **Signal Measurement and Analysis (3)**

This class studied how to measure and analyze acoustic and vibrational signals. To this end, the followings are treated: acoustic and vibrational sensors, FFT, transfer function, filters, sound identification techniques.

- **Understanding of Automotive Electronic Systems (3)**

This course involves understanding of characteristics and basic operation analog passive/active elements, digital logic circuits and microcontrollers. It is also an introductory course on instrumentation, control, and diagnosis of drive systems, chassis systems, and body systems in vehicles.

- **Understanding of Battery Management Circuit for Smart Electric Vehicle (3)**

Understand the basic structure and operation of a battery management system. Also, core analog/digital circuits for the battery management system such as DC-DC converters or active battery balancing circuits are introduced.

- **Understanding of Intelligent Transport System (3)**

Develop an understanding of ITS which applies advanced technologies in electricity, control and communication to modes and systems of transport in order to enhance the efficiency and safety of transportation operation.

- **Future Prospects Transportation System based on ICT (3)**

With the prospect of a mega-trend and transportation system in the future, design a transport system of electric cars based on ICT applications.

- **Research Ethics & Thesis Study (3)**

Research ethics will be discussed for the M.S. and Ph.D. students with the typical examples occurring in the research and development environment. Furthermore, internationally

acknowledged rules and regulations will be discussed and the purpose and the importance of observing the regulations will be studied with renown examples and cases.

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## Dept. of Nano Science and Technology

### ❑ Nano - material Major

The graduate school of Advanced Materials Engineering Department in Kookmin University was established in November 1974 after the authorization of Ministry of Education. The goal of our graduate course is to educate students who will become pro-active leaders with creative mind in the field of materials related industry by utilizing knowledge of materials engineering. Until now, more than 200 students with master and doctor degrees have been produced and they play a critical role in the field of industry, academia, and education. 19 faculty members in the graduate school of Advanced Materials Engineering Department are actively doing research works in the field of metals, ceramics, polymers, semiconductors, displays, energy/ environment. Also, the department possesses many up-to-date experimental equipments for various materials-related researches.

### ❑ Nano - physics Major

The goal of the Department of Nano Science and Technology (Nano-Physics Major) at Kookmin University is to educate the scientists and researchers in the emerging field of nanoscience and nanotechnology, and to carry out the innovative research in multidisciplinary environment. The courses offered in our department covers various topics with an emphasis on Physics and research activities includes the fabrication and measurement at nanometer scale as well as the physical analysis.

### ❑ Nano - chemistry Major

Nanochemistry is a subject dealing with the chemistry of making, analyzing, and applying substances that are active in the nanoscopic world in which substances are measured in one billionths of a meter. Nanochemistry, while serving as the basis for various sciences and technologies, is a very broad field involving the life sciences, energy, electronics, environment, and materials. So, the new discipline of nanochemistry has already made it possible for us to step into the world of superfine substances, make first-hand observations of and work with molecules and atoms on a nano-meter scale, including biomolecules and other functionally advanced materials.

### ❑ Nano - electron Major

Nano-Electronics Major offers one of the most comprehensive research and instructional programs with Master's degree. In this Major, 1 Nano-electronic

semiconductor devices including extremely scaled conventional devices, quantum effect devices, and nano-structured volatile and nonvolatile memory devices, 2 Nano-electronic analog integrated circuit design, 3 Nano-electronic low-voltage-low-power integrated circuits, 4 Nano-electronic mixed-mode integrated circuits will be intensively taught and investigated.

## ☐ **Courses**

### ☐ Nano-material Major

- **Advanced Semiconductor Physics and Technology (3)**

Behaviors of electrons and holes in semiconductor are discussed and their relevant p-n junction, Schottky junction, MOS capacitors and MOSFET are studied.

- **Thin Film Science and Processing (3)**

The object of "Thin Film Science and Engineering" class is not only to document what is known about thin films including multilayers, but also to promote the potential of these versatile thin films and to facilitate the adsorption of the technology by others. The field introduced in this class is new. This class will show that thin films including multilayers represent a model platform for promoting modern research and furthermore, the intellectual distance between concept and application is minimal.

- **Nanotechnology (3)**

This course will introduce students to the relevant concepts related to the synthesis, science, characterization, and engineering of nanomaterials. Special applications in nanotechnology will also be reviewed, including bio-medical, environmental, energy, defense, and telecommunication areas.

- **Electrochemical Engineering (3)**

Electrochemical Engineering is the course to understand the electrochemical principles and how to apply those theories to the relevant industries such as corrosion, surface finishing, battery and fuel cell and hydrometallurgy. This course covers the fundamental concept of electrochemistry, the equilibrium and the kinetics of electrochemical reactions, the corrosion of materials, the surface-treatment, and the energy conversion methods such as battery and fuel cell.

- **Mechanical Properties of Thin Films (3)**

This course covers the mechanical properties of the thin films deposited on various substrates with an emphasis on thin film dynamics, process-related stresses, and the measurement of thin film stresses. In addition, effects of the microstructure of thin film depending on the process variables such as substrate temperature and pressure,

on its plastic deformation and elastic behavior will be discussed.

- **Multilevel Interconnect Technology(3)**

This course covers the integration process for multilevel metallizations in an advanced semiconductor device fabrication. The process includes the formation of metals, diffusion barrier metals and compounds, the insulators over a complex structure, and the planarization process as well. In addition, the dependence of device characteristics and reliability on the metallization process will be discussed.

- **Plasma Physics and Processing (3)**

The goal of this course is to provide the student with a sound, scientific understanding of plasma physics and plasma chemistry through which he can better use plasma processes for microelectronic fabrication. The introduction of various plasma processes for sputtering, etching, plasma-enhanced chemical deposition of thin films helps him to know the main factors affecting each plasma process. In addition, vacuum technology and surface measurement is to be provided to improve his practical ability to control the processes.

- **Powder Processing (3)**

Topics include fabrication, properties, components of powder and fundamentals of sintering. Industrial application examples of powder metallurgy are also examined.

- **Electronic Materials Fabrication Processing (3)**

The goal of this course is to provide the student with a fundamental understanding of each process for the fabrication of microelectronic and electronic devices. The processes of oxidation, diffusion, ion implantation, etching, photolithography, metallization and packaging will be discussed with an emphasis on the principle of each process and its equipment, and the process-related issues.

- **Process Integrate Circuits (3)**

This course is to provide the student with an understanding of each process for the fabrication of semiconductor devices and the process integration of Integrated Circuits. In addition, the process for  $1\mu\text{m}$ ,  $0.8\mu\text{m}$ , and  $0.5\mu\text{m}$  CMOS will be introduced, and then discussing its device characteristics. Based on the technology roadmap, the progress for the process development required for the future devices will be predicted and discussed.

- **Electronic Ceramic (3)**

Principles of various electronic ceramics are introduced and semiconducting, insulating, high dielectric, magnetic, superconducting ceramics are discussed. Applications, such

as sensors, actuators, solid oxide fuel cells and MEMS are also discussed.

#### Fracture Mechanics of Engineering Materials

Based on fracture mechanics, characterization and design applications of fracture, fatigue, creep of metals are studied.

- **Electronic Materials (3)**

This course is designed to achieve knowledge of principles, properties and applications of electronic materials. Topics include conductor, semiconductors, superconductors, dielectrics and ferroelectrics.

- **Advanced Process Design of Metallic Materials (3)**

Recent advanced technology in processing and design of metallic materials is presented and studied along with their applications, such as processing of nano-materials, multi-phase materials, and shape-memory alloys.

- **Advanced Ceramic Materials (3)**

Definition and crystal structures of ceramic materials are fundamental topics and different kinds of bonding and defect structures are advanced subject in this course. In addition it includes effect of crystal structures and defect structures on their physical properties.

- **Materials for Information Technology (3)**

This course will present to students information storage, transmission, and related materials and technology with special emphasis on materials technologies in the areas of optical information processing, memory semiconductors, and large-scale information storage.

- **Electronic Display Engineering (3)**

The purpose of this course is to gain an understanding of the principles and techniques of materials and process for flat panel displays EL, LCD, PDP, FED.... fabrication. Topics also include the characterization and evaluation of display materials and related technologies. Emphasis on materials design in relation to fundamental device characteristics.

- **Nano-material Chemistry & Technology (3)**

In this course, students will learn critical knowledge of chemistry and technology in the areas of advanced metals, polymers, and ceramics. Course modules will cover the fundamental scientific principles of molecular structure, chemical bonding, and structural measurement and analysis of materials at nano-scale level as well as related basic theories and mechanisms.

- **Advanced Polymer Materials(3)**

Overview of the problems associated with the selection, design, and function of advanced polymers is presented in this course. Particular emphasis is placed on discussion of the advanced application areas of polymer materials, which may include display, semiconductor, and energy technologies.

- **Advanced Computational Materials Science(3)**

This course introduces advanced computer modeling methods in materials science and engineering using discrete particle systems and continuum fields. It covers techniques and software for statistical sampling, simulation, and uses statistical, quantum chemical, molecular dynamics, Monte Carlo, mesoscale and continuum methods to study fundamental physical phenomena encountered in the fields of computational physics, chemistry, mechanics, materials science, biology, and applied mathematics. A term project allows development of individual interests. Students are mentored by members of CMS Lab. in KMU.

- **Surface and Interface Science(3)**

This course surveys the basic concepts of surface and interface free energy, various phase transitions on the surface and interface such as surface roughening, surface reconstruction, etc.. Goals of the course also include the understanding of reaction rate on the surface and interface, physisorption or chemisorption, the role of stress in thin film growth, etc..

- Nano -electron Major

- **Semiconductor Physics (3)**

In this lecture, semiconductor physics, including crystal lattice structures, properties of semiconductors, wave phenomena and magnetic properties, electron emission, carrier generation and recombination property in the semiconductors, will be discussed.

- **High-Speed and High-Frequency Semiconductor Devices (3)**

In this lecture, high-speed and high frequency characteristics of microwave- and millimeter-wave devices, which include compound semiconductor devices such as HEMTs high-electron mobility transistor and HBTs heterojunction bipolar transistors, will be discussed in detail. Design, implementation, and characterization techniques will be discussed for better electrical performances.

- **Quantum Electronics (3)**

In this lecture, properties of the quantum mechanical electronic systems, basic

concepts of the quantum mechanics, crystal structure in the quantum-mechanical scale, spins and energy band diagram theory in the lattice semiconductors will be discussed.

- **Application Specific Integrated Circuit Design (3)**

Analog and digital IC designs for a single-chip implementation of the application-specific integrated systems with signal processing, automatic control, artificial intelligence, and image processing.

- **Semiconductor Device Physics and Characteristics (3)**

Secondary effects and non-ideal device characteristics in semiconductor materials and devices will be discussed. Hot carrier effects and reliability-related physical mechanisms will be also discussed in this lecture.

- **Advanced Topics on Semiconductor Device Physics and Characteristics (3)**

Electrical characteristics of unipolar-type IC devices JFET, MOSFET, MESFET, as analog or digital IC components, will be taught in detail.

- **Characterization of Semiconductor Materials and Devices (3)**

In this lecture, analysis, modeling, parameter extraction method of the characterization parameters and their applications for the electrical and optical characteristics of the semiconductor devices will be discussed in detail.

- **Analog Integrated Circuit Design (3)**

Analog signal-processing chip design based on a standard CMOS process will be discussed in this lecture. In the first, the basic concept of analog signal-processing with various transformation techniques including the z-transform and the op-amp, which is a basic building block in the analog signal processing circuits, will be taught in detail. The concept of the switched-capacitor filter for accurate analog signal-processing and its application analog filters will be also considered in the lecture.

- **VLSI Process Technology (3)**

Modern CMOS VLSI technology is covered in depth in this course to understand the physical phenomena in the fabrication process and characterize the VLSI circuit. In this course, the individual process steps including epitaxial growth, lithography, oxidation, metallization, etching, and so on are discussed in details. Moreover, the integrated manufacturing processes using many individual steps are covered.

- **Digital VLSI Design (3)**

Based on the knowledge on the fundamental digital logic and CMOS technology, this course aims to convey knowledge of advanced concepts of circuit design for digital



LSI and VLSI components in state of the art CMOS technologies. Emphasis in this course is on the circuit design, optimization, and layout of CPU, ALU, register file, digital filter, RAM, ROM, and so on.

- **Low - Power Integrated Circuit Design (3)**

Low power circuit technology is strongly required to enhance battery lifetime especially in portable devices such as mobile phone and notebook. This power consumption can be divided into two categories of the dynamic and static consumption. Recently developed logic families and clocking strategy to reduce the dynamic power consumption are discussed in this course. In addition, static-power reduction techniques using dynamic threshold-voltage scheme, power cut-off switch, and so on are covered.

- **Memory Circuit Design (3)**

Memory devices as a core semiconductor industry, specifically, a circuit design of DRAM will be discussed in the lecture. The principle of the memory cells, cell-arrays, circuit technologies of various peripheral circuits incorporated in the row path, column path, and the performance enhancement strategy of the overall chip in the high-speed DRAMs, including SDRAM synchronous DRAM or DDR dual-data rate SDRAM, will be considered in detail.

- **Optical Semiconductor Devices (3)**

Operation principle, design method, characterization and its applications of optical-electrical / electrical-optical semiconductor devices for the absorption and emission of the light will be discussed in this lecture.

- **Advanced Topics in Integrated Circuit Design (3)**

The current research trends and problems in modern CMOS VLSI design are discussed in this course. In modern very deep-submicron VLSI design, high-speed signaling and low power issues such as signal integrity, interconnect, power distribution, power consumption, and timing becomes important, as devices go scaled further down. This course aims to introduce the recent design techniques, the optimization algorithms, and the layout methodologies to solve the signaling and low power issues in modern very deep-submicron VLSI design.

- **Nanostructure Semiconductor Device Technology (3)**

The principle, characterization, analysis, and applications of nano-structure electrical and optical devices, which focus on the quantum effects in the semiconductor, will be discussed in this lecture.

- **VLSI System Design (3)**

Digital circuit technology based on the standard CMOS process will be discussed in this lecture. The delta-sigma data converters adopting digital signal-processing theory, in order to achieve a very high resolution, will be intensively considered. For this purpose, a digital signal-processing, especially the multi-rate sampling frequency system, will be taught in depth. Various types of delta-sigma architectures, digital behavioral blocks and VLSI implementation will be also treated in the lecture.

- **SoC Design (3)**

The methodology for the IP-based SoC system-on-a-chip design will be discussed in detail. The hardware-description languages of VHDL or Verilog-HDL as a basic design tool for the SoC design will be studied, and the synthesis of digital circuits, verification methods, an auto-placement and routing technique in the layout design will be taught in hand. Some standards for the coding guideline and mixed-mode specs will be also introduced.

- **Mixed-Mode Integrated Circuits (3)**

Main subsystems of the mixed-mode integrated circuits, based on a standard CMOS process, will be discussed. Issues on the design of analog filters adopting switched-capacitor circuits, A/D converters, D/A converters, PLL phase-locked loop and DLL delay-locked loop will be studied in depth.

□ Nano-physics Major

- **Classical Mechanics (3)**

This course on the classical mechanics presents Lagrangian and Hamilton mechanics using Hamiltonian theory. Various aspects of mechanics such as small oscillation, collision of two particles and relativistic theory will be discussed.

- **Electrodynamics (3)**

This course covers the advanced topics in electromagnetism such as electrostatic fields in vacuum and in dielectrics, magnetic fields associated with constant and variable currents, magnetic materials, and Maxwell's equations.

- **Quantum Mechanics (3)**

This course introduces the advanced concepts in Quantum Mechanics: Schrodinger equation, operators, angular momentum, harmonic oscillator, atomic hydrogen, perturbation theory, scattering theory, identical particles, and radiation.

- **Solid State Physics (3)**

This course discusses various physical phenomena in solid. The topics covered in the course are atomic, molecular and crystal structure, energy levels of electrons, and

binding energies in molecules and solids.

- **Statistical Mechanics (3)**

This course discusses the concepts and application of statistical mechanics in various fields of physics. The topics include introduction to equilibrium thermodynamics and elementary statistical mechanics.

- **Mechanics Physics (3)**

This course introduces the various aspects of mathematical physics including ordinary differential equation, complex variable, and calculus of variation. The course also presents the methods of the numerical solution.

- **Semiconductor Physics (3)**

This course discusses the physical properties of semiconductor physics such as lattice vibration, band structure and conductivity of semiconductor.

- **Material Physics (3)**

This course presents the topics in modern material physics. This course also discusses the current theoretical and experimental works in the field of material physics in addition to the introduction of the basics of magnetic, superconducting and dielectric materials.

- **Magnetism (3)**

This course discusses the advanced topics on modern physics of magnetism and magnetic materials such as spintronics and multiferroic materials as well as their applications in addition to the basics of magnetic, electronic properties and applications of magnetic materials.

- **Physics of Thin Films (3)**

This course is intended to serve as an advanced course on thin films and their properties as well as their applications. In addition, the growth mechanism of thin films and various film growth techniques such as PECVD, LPCVD, and MOCVD will be discussed. Especially, this course focuses on various physical properties of superconducting, metallic, semiconducting, magnetic thin films.

- **Research in Solid State Physics (3)**

This course presents the current topics in the field of solid state physics. This course introduces current theories in solid state physics and offers chances to review some of solid state physics experiments. This course is intended for a small group of students involved in various research projects to discuss the current topics in solid state

physics, which are actively pursued in the field of solid state physics.

- **Research in Magnetism (3)**

This course presents the current topics in physics of magnetism. This course introduces current theories in the field of magnetism and offers chances to review some of experiments such as spintronics and dilute magnetic semiconductors. This course is intended for a small group of students involved in various research projects to discuss the current topics in magnetism, which are actively pursued in the field of magnetism and their applications.

- **Surface Physics (3)**

This course is intended to serve as a graduate level course on the surface physics. This course describes the fundamental physical processes on surfaces. Also, this course covers the basic theories of surface physics and their applications. In addition, this course describes the various analysis methods on the solid surface using ARS, SIMS, XPS, AFM, SEM, TEM and RBS.

- **Semiconductor Process (3)**

This course provides technological aspects of the semiconductor process such as crystal growing, vacuum technology, diffusion barrier and amorphous process, in addition to the introduction of the basics of the semiconductor physics.

□ Nano - chemistry Major

- **Advanced Analytical Chemistry (3)**

Treatment of the basic issues of importance in modern analytical chemistry. Topics include basic chemical and measurement concepts, measurement instrumentation and techniques, and principles, tools, and applications in spectroscopy, electrochemistry, separations, sensors, mass spectroscopy and surface characterization.

- **Advanced Physical Chemistry (3)**

The principles of physical chemistry are studied from the standpoint of the laws of thermodynamics, kinetic theory, statistical mechanics, quantum chemistry and molecular spectroscopy.

- **Biochemistry (3)**

This subject gives an opportunity to understand the life science by dealing with Enzyme structure and mechanism, protein modification, signal transduction in sensory systems, DNA and RNA biochemistry, and biochemistry of disease.

- **Material Chemistry (3)**

Chemistry has a vital role to play in materials processing and in the development of new materials. This course is concerned with the basic underlying principles and the technological relevance of major topics in advanced material chemistry. This course includes organic, inorganic, solid-state, and surface chemistry as well as polymer and materials science.

- **Chemical Instrumentation (3)**

Principles of instrumental analysis. Application of separation techniques and instrumental analysis

- **Thin Films (3)**

This course includes the developments in the physical and chemical sciences that have changed the design, manufacture, and analysis of thin films, and their application, especially in communications and information processing, storage, and display

- **Solid State Chemistry (3)**

Solid state chemistry has emerged as a very important element of mainstream chemistry and modern materials science. This course is concerned with the synthesis, structure, and properties and applications of solid materials, and plays a crucial role in determining the properties of materials. An understanding of solid state chemistry is also essential in materials design.

- **X-Ray Diffractometry (3)**

The principles and practice of the determination of structures by single crystal x-ray diffraction techniques. Crystal symmetry, diffraction, structure solution and refinement. Opportunities for hands-on experience in structure determination.

- **Nanochemistry (3)**

Nano chemistry is related with chemical methods to build nano structures with atoms and molecules. This course presents nano chemistry with the most up to date survey of current applications, research, and technical challenges.

- **Molecular Spectroscopy (3)**

The course will explore the interaction of light with matter. We will start with the quantum mechanical foundations of spectroscopy and follow with a detailed treatment of a variety of different spectroscopies, including the study of rotation, rotation and vibration, and electronic spectra for simple molecules as well as polyatomics. As time and interest allow, we will cover special topics such as magnetic resonance, nonlinear and molecular beam spectroscopies.

- **Surface Chemistry (3)**

Introduction to the behavior of molecules adsorbed on solid surfaces: the structure of surfaces and adsorbate layers. The bonding of molecules to surfaces: adsorbate phase transitions: trapping and sticking of molecules on surfaces. An introduction to surface reactions: kinetics of surface reactions. A review of principles of chemical reactivity: reactivity trends on surfaces: prediction of rates and mechanisms of reactions on metals, semiconductors, and insulators.

- **Solid State Physical Chemistry (3)**

Introduction to the theory of electrons in solids: bands and zones. Absorption of light and excitons. Vacancies, interstitials, electronic defects and dislocations and their roles in chemical reactivity

- **Research in Physical Chemistry (3)**

An upper-division student in good standing is urged to pursue an experimental research in physical chemistry with the guidance of any member of the chemistry faculty chosen

- **Research in Organic Chemistry (3)**

An upper-division student in good standing is urged to pursue an experimental research in organic chemistry with the guidance of any member of the chemistry faculty chosen.

- **Research in Inorganic Chemistry (3)**

An upper-division student in good standing is urged to pursue an experimental research in inorganic chemistry with the guidance of any member of the chemistry faculty chosen.

- **Research in Nano Chemistry (3)**

An upper-division student in good standing is urged to pursue an experimental research in nanochemistry with the guidance of any member of the chemistry faculty chosen.

- **Research in Biochemistry (3)**

An upper-division student in good standing is urged to pursue an experimental research in biochemistry with the guidance of any member of the chemistry faculty chosen.

- **Seminar in Physical . Analytical Chemistry (3)**

To aid students in learning to speak well publicly. The focus is on discussing in

physical and analytical chemistry topics from journal articles appearing in recent year.

- **Seminar in Organic Chemistry (3)**

To aid students in learning to speak well publicly. The focus is on discussing in organic chemistry topics from journal articles appearing in recent year.

- **Seminar in Inorganic Chemistry (3)**

To aid students in learning to present well publicly, the class is focused on discussing in inorganic chemistry topics from journal articles appearing in recent years.

- **Seminar in Nano Chemistry (3)**

To aid students in learning to speak well publicly. The focus is on discussing in nano-chemistry topics from journal articles appearing in recent year.

- **Seminar in Biochemistry (3)**

To aid students in learning to speak well publicly. The focus is on discussing in biochemistry topics from journal articles appearing in recent year.

## Dept. Applied Information Technology

This Graduate School program for the interdisciplinary studies offers an excellent education of applied information technology (AIT). The AIT focuses on the emerging high-technologies of science and engineering in a student-chosen application area. Therefore the wide range courses of this postgraduate study are provided by the Departments of Computer Science, Electronics Engineering, Mathematics, Physics, as well as College of Forest Science.

Graduate training in AIT aims to meet the advancing research and emerging needs of the information technology industry for creating new markets. The master program is rooted in educating classic information technology, centered around its applications such as professional development of security-related technology and of bio-medical engineering based on human welfare.

### ☐ **Courses**

#### • **Data Structure and Algorithm (3)**

An introduction to the design of algorithms. The emphasis is on learning techniques for creating algorithms, analyzing them, and proving their correctness. Topics include models of computation, asymptotic notation for analysis of algorithms, sorting and searching algorithms, design techniques such as divide-and conquer and dynamic programming, graph algorithms including spanning tree, shortest paths. Additional topics chosen from pattern matching, NP-hard, and NP-complete

#### • **Numerical Analysis (3)**

Advanced topics in scientific computation. Topics include differentiation, integration, solution of differential equations, equation solving, minimization/ maximization, linear algebra, interpolation

#### • **Programming Language (3)**

This course covers formal and practical study of the definition, application and implementation of programming languages. It includes linguistic concepts of syntax and semantics, translation of high level languages into executable form. Data structuring, sequencing constructs and modularization features of representative languages.

#### • **Wireless Network (3)**

The course includes the wireless networks protocols and physical layers for wireless multimedia applications. It covers WLAN, WPAN, ad-hoc networks, sensor networks. The course also deals with IPv6, Mobile IP, Cellular IP, and QoS MAC protocols.



- **Operating System (3)**

This course covers in detail many advanced topics in operating system design and implementation. It starts with topics such as operating systems structuring, multi-threading and synchronization and then moves on to systems issues in parallel and distributed computing systems.

- **Digital Communication System (3)**

This course is devoted to a detailed and unified treatment of digital communication theory as applied to communication system focused on the system reliability. Topics include source coding, signal encoding, representation, and quantization; methods of modulation, synchronization, and transmission; optimum demodulation techniques; and communication through band-limited and random channels.

- **Advanced Artificial Intelligence (3)**

This course addresses the use of artificial intelligence and cognitive psychology to build computer-based intelligent tutoring systems. Students will learn empirical and theoretical methods for creating cognitive models of human problem solving. Such models have been used to create educational software that has been demonstrated to dramatically enhance student learning in domains like mathematics and computer programming. This course will have three components: a literature review of some of the fundamental papers in the field; lectures on the needed cognitive psychology and human-computer interaction (HCI) background; and a significant project component in which students will be practicing the use of methods used to design tutors.

- **Ubiquitous Sensor Network (3)**

We introduce ubiquitous sensor network and its applications. Sensor network protocol and sensor node's architecture will be studied. We will cover physical layer, localization, tracking, MAC protocol, network layer including routing protocols, sensor tasking and control, sensor network platform, and mesh network. Convergence with WLAN, cellular network, satellite network, and greedy system will be studied, and the future of sensor network also will be explored.

- **Telegeoinformatics (3)**

An introduction to mobile mapping. The course deal with 4 features, i.e., geopositioning of mobile devices, data and processing generally performed on spatial objects, distributed database management and processing, and location-based techniques required for computing and decision making.

- **Precision Agroforestry (3)**

Advanced technology to both farm and forest production, management and manufacturing at a new scale of resolution and accuracy with the goal of producing economic and environmental benefits. The course provides practice examples on RS, GIS and GPS as a tool to support precision agroforestry.

- **Digital Photogrammetry (3)**

This course provides the useful understanding of modern photogrammetry for deriving and acquiring digital imagery. It includes image processing algorithms for image correlation and calculation.

- **Theory of Discrete Distribution (3)**

Probability generating functions, Poisson distribution, mixed discrete distribution, multivariate discrete distribution.

- **Applied Optics (3)**

This course is intended to serve as a graduate level introductory course on optics. This course focuses on introducing general theories of optics such as geometric and physical optics, aberrations, optical instrumentation, interference, and polarization in optics. In addition, brief description of current researches in optics and their applications in modern technologies will be presented.

- **Database System (3)**

Introduction to advanced database systems from a perspective of implementation. Topics include query processing, transaction management, concurrency control techniques, database recovery, database security and authorization, and how these concepts are implemented in real systems.

- **Image Processing (3)**

The course will provide mathematical foundations and practical techniques for digital manipulation of images; image acquisition; preprocessing; image transforms, image enhancement, image restoration, image coding, edge detection and segmentation, feature extraction, and image analysis

- **Programming Language (3)**

This course covers formal and practical study of the definition, application and implementation of programming languages. It includes linguistic concepts of syntax and semantics, translation of high level languages into executable form. Data structuring, sequencing constructs and modularization features of representative languages.

- **Sampling Theory (3)**

Study on sampling theory, problem in sampling methods, decision of sample size, and sample survey.

- **GPS Applications (3)**

Introduction to the concepts needed to use GPS, GLONASS and QZSS. This course is also intended to increase student's enabling many kinds of GPS applications.

- **Web Information Processing Applications (3)**

Introduction to the methods used to search for and discover information in the Web and Web information systems. Methods that are covered include techniques for searching, browsing and filtering information, classification, clustering, filtering, web mining, the use of classification systems and thesaurus, and Web search systems.

- **Advanced Object Oriented Programming (3)**

Introduction to the principles underlying state of the art object-oriented technology. Besides the object-oriented programming language, topics also include object-oriented analysis and design, unified process, and design patterns issues.

- **Concepts of Functional Programming Languages (3)**

Introduction to the concepts of programming languages which combine functional and logic programming techniques. The course covers high-order functions, pure functions, recursion, strict versus non-strict evaluation, type systems and pattern matching, functional programming in non-functional languages.

- **Advanced Information-Technology Mathematics (3)**

Study the math. fundamentals of information theory in the foundation of information technology. The course deal with uncertainty, entropy, and channel coding theory based on statistics and probability.

- **Signal Processing for Remote Sensing (3)**

Fundamentals of signal Processing application in remote sensing. This course covers principal component analysis, projected principal component analysis, Kalman adaptive filtering, time series analysis, neural network parameter retrieval, and independent component analysis.

- **'Radiometry (3)**

Fundamentals of measuring the radiation of various objects. This course also involves both the techniques of calculating radiative transfer and the measurement of fluxes and radiometric properties of different sorts.

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## Department of Conservation of Cultural Heritage

The value of cultural property is immeasurable. Cultural properties often have a very significant information concerning a people's origin, history, and traditional setting. Department of Conservation of Cultural Heritage carries out humanistic and scientific research into a broad range of conservation issues for cultural heritage. The department aim is focused in understanding the overall conservation science and practice for the protection of cultural heritage. For this purpose, the program is organized by integrated academic fields in history, archaeology, art & art history, architecture, chemistry, physics, material science, paper & wood science, and conservation science. The academic courses cover the entry-level introduction to the scientific methods and techniques, and the rationales of scientific investigation and practice for the conservation of cultural heritage. The specific areas of department include the records repository, art museum and art gallery, museum, and related conservation research center.

### ☐ Courses

#### ☐ Conservation of Cultural Heritage Major Courses

- **Topics in Korean Cultural History**

Considering historical characteristics by looking at transition of culture of the development of Korean history.

- **Readings in Korean History Original**

Reading historical materials that are the basis for understanding pre-modern and modern Korean history to cultivate the ability to understanding a social aspect in that time and to interpret literature.

- **Studies in Archives Management of History**

Acquired to fundamental knowledge of archives management of history.

- **Old Document Researches in Korea**

Considering description methods of traditional history with Quellenkritik by looking at Old document.

- **Study of Korean History and Cultural Properties**

Intensifying historical understanding about cultural heritage by looking at Korean cultural heritages.

- Seminar on Korean History  
Understanding historical and social background by grasping trends and features of various remains and heritages.
- Field Work in Cultural Properties & Sites  
Enhancing the importance of protection of cultural property and historical views with practical knowledge through selecting and reading historical materials of field studies and visiting the actual spots of History themselves.
- Research & Investigations in Archaeology  
Developing basic skills for archaeology by acquiring conception and method of various theoretical models about archaeology.
- Advanced Study of Museum & Gallery  
Considering expert knowledges about storage of cultural heritage, display, preservation treatment and education.
- Studies of Folklore  
Understanding folk cultural theories and methodologies by studying traditional culture by examining a folk customs, and faiths.
- Topics in Legislation of Cultural Assets  
Considering expert knowledges about preserving and repairing cultural properties.
- Studies in History of Art  
Considering historical significance and characteristic by comparing and analyzing art history of Korea and the Orient.
- Understand & Conservation Theory in Art Works  
Studying conservation theory of art work as a management plan about various elements that cause damage of perception subjective and damage of work to art work.
- Critique of Eastern and Western Art  
Considering the West and the Orient histories of Buddhism that were influenced to formation of the Korean ancient culture.
- Theory of Organizing Exhibition Planning  
Developing executive ability to display cultural heritages in museums, and studying expert knowledges about overall plan of display.

- **Introduction to Conservation Science for Cultural Properties**  
Understanding the overall theories and material properties for conservation, cause analysis of deterioration, and studying the new trends of conservation science by scientific approaches.
- **Repair and Maintenance Technology in Wooden Cultural Properties**  
Covering the conservation-restoration treatments for the continuance of wooden cultural properties to exist in its best condition possible, regardless of age and degradation.
- **Advanced Study of Conservation Science for Paper Cultural Assets**  
Understanding the organic and inorganic materials for paper or fabric-based cultural properties, and studying the aging factors of paper materials, destructive and non-destructive methods for paper cultural properties.
- **Advanced Conservation Science and Technology in Wooden Cultural Properties**  
Covering the related theories and technologies in area of conservation & restoration of wooden cultural properties. Key focus of conservation science is studying the protect methods, wood preservatives, remedial treatments as well as maintenance technologies.
- **Conservation Science for Cultural Properties Seminar**  
Discussing the general topics of conservation science for cultural properties, and studying the research trends for understanding the modern conservation technologies.
- **Advanced microbiology and insectology in Cultural Properties**  
Dealing with the related theory of destroying microorganisms and insects for the various cultural properties, emphasizing concepts as well as understanding deteriorating characteristics.
- **Nondestructive Research for Cultural Properties**  
Understanding the status survey methodologies of cultural properties by non-destructive methods and combination technologies with various conservation approaches.
- **Chemical Instrumentation analytics**  
Understanding the principles of chemical equipments and instruments, and applications of FT-IR, UV, and visible spectroscopy, nuclear magnetic resonance spectroscopy, mass spectrometry, x-ray diffraction technique and other modern instrumental techniques for analysing the various cultural properties.



- Basic Chemistry for Cultural Assets  
Understanding the fundamentals of organic and inorganic chemistry, regarding on basic chemical bonding, reaction and mechanism for researching the cultural properties.
- Materials of Cultural Properties and Practice  
Understanding the conservation materials according to the types of cultural assets, and the application of various materials to the cultural properties.
- Hand-made Paper Practice  
Covering the properties of papermaking fibers and non-fibrous additives, papermaking process, additional finishings, and the physical, mechanical and optical properties of paper, and also leaf-casting theories and application with fibrous materials.
- Practice in Reproduction of Painting Cultural Assets  
Practice courses in reproduction process of painting cultural properties, and understanding the history, purpose and ethnics for conservation and restoration process.
- Practice of Conservation Technique for Painting Cultural Assets  
Practice courses in conservational process and treatment of painting cultural properties.
- Practice of Conservation Technique for Organic Cultural Assets  
Practice courses in conservational process and treatment of paper and fabric material-based cultural properties.
- Practice of Conservation Technique for Inorganic Cultural Assets  
Practice courses in conservational process and treatment of glass and ceramic material-based cultural properties.
- Practice of Conservation Technique for Metal Cultural Assets  
Practice courses in conservational process and treatment of metallic material-based cultural properties.
- Practice of Conservation Technique for Wooden Cultural Assets  
Practice courses in conservational process and treatment of wooden material-based cultural properties.
- Photographics in Cultural Properties & Practice  
Understanding the concept and techniques of photography for the status analysis,

exhibition and work portfolio of cultural properties.

- Advanced study Tradition Architecture

Advanced course in traditional architecture for understanding the characteristics and structures of oriental/Korean architecture, and studying the history and morphological changes of architecture.

- Advanced Study of Deterioration in Wooden Cultural Properties

Managing the advanced theories centered on the causes of occurrence and detailed damage properties for wooden cultural properties by weathering conditions and wood deteriorating organisms.

- Inspection of wooden cultural properties

Dealing with the condition inspection methods and technologies of wooden cultural properties, which include various informations on visual inspection techniques, mechanical coring or probing techniques, and stress wave or ultrasound-based techniques etc..

- Thesis Research

Understanding the nature and definition of research ethics and producing new knowledge, new materials, or new methods in the student's field of specialization.

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## Dept. of Integrative Biomedical Science and Engineering

The Department of Integrative Biomedical Science and Engineering offers an excellent education and interdisciplinary cutting-edge research programs to train future leaders and innovators in biomedical science and engineering. Faculties from biochemistry, food and nutrition, materials, electrical and mechanical engineering, and computer science provide a broad range of courses and joint research projects in partnership with academia and industry.

### ☐ Biomedical Science Major

Biomedical Science Major specializes in biological or medical application of basic sciences in the context of medicine. A wide range of courses are provided by faculties from biochemistry, food and nutrition, materials, and engineering. Our program trains future leaders and innovators in biomedical science by offering an excellent education and cutting-edge research projects.

### ☐ Biomedical Engineering Major

Biomedical Engineering Major specializes in biological or medical application of engineering principles or engineering systems to living things. A broad range of courses are provided by faculties from mechanical and electrical engineering, computer science, materials, and biochemistry. Our program trains future leaders and innovators in biomedical engineering by offering an excellent education and cutting-edge research projects.

### ☐ Courses

#### ☐ Core Courses

##### • **Molecular and Cellular Biology (3)**

The goal of the course is for graduate students to learn about basic concepts in molecular cell biology. Topics include chemistry of nucleic acids, DNA topology, DNA replication, repair and recombination, recombinant DNA technology, transcription, RNA processing and post-transcriptional control, translation and post-translational modification, protein structure and function, techniques for protein purification, tools for protein analysis, membrane biology, intracellular trafficking, cytoskeleton, cell cycle and division, cell signaling, and programmed cell death.

##### • **Introduction to Biomedical Engineering (3)**

Designed as a freshmen course, this lecture will provide the overview of the

biomedical engineering field. Faculty from various School of Engineering departments will give background lectures to introduce students to the fundamental basis for biomedical engineering and its application and impact to biomedicine. Topics include but not limited to biomaterials, biomechanics, bioelectronics and medical imaging.

- **Seminar on Modern Bioengineering (3)**

This course will examine the recent research trends in the biomedical science and engineering field. Specialists and scholars will be invited to give lectures on the new technologies and innovations. This course will focus on the currently debated areas of research in the relevant fields.

- **Independent Study1 (3)**

Under guidance of instructor, the basic procedures for thesis writing will be studied from selection of research topic in biomedical science and engineering, literature survey, methodology, analysis of results, paper writing and presentation.

- **Independent Study2 (3)**

Under guidance of instructor, the basic procedures for thesis writing will be studied from selection of research topic in biomedical science and engineering, literature survey, methodology, analysis of results, paper writing and presentation.

- **Biomedical Science Major**

- **Advanced Biology (3)**

This lecture will cover the up-to-date knowledge of biochemistry, molecular biology, molecular cell biology, microbiology, animal cell and tissue, and human physiology, which are the basis of biomedical science and biomedical engineering.

- **Current Topics in Bio Medicinal Materials (3)**

Studies and discuss on the current research trend in pharmaceutical and medical applications.

- **Advanced Biotechnology (3)**

This course covers the recent research trend and technology in the area of bio informatics, gene cloning, construction of genetically modified microorganisms, production of recombinant enzymes in microbial systems and kinetic analysis of recombinant enzymes.

- **Biomedical Engineering Major**

- **Biomaterials (3)**

The purpose of this course is to introduce various biocompatible materials and to let

students understand synthesis technology and material properties of biomaterials.

- **Biotransport Phenomena (3)**

Understanding the physical, chemical and biological processes governing the movement of mass and transmission of forces throughout an organism is important in biomedical engineering and physiology. This course will cover transport processes which influence the normal and pathological function of cells and organs and provide fundamental knowledge of transport processes which are important in the design and operation of a number of biomedical devices.

- **Biomedical Optical Imaging (3)**

This course is intended to provide the optical imaging techniques and related photonics theory in biomedical field to visualize multiscale biological processes which are highly dynamic and complex in nature.

- **Cell Mechanics (3)**

This course focuses on the mechanical aspects of the cell including mechanotransduction. To study how cell biology and biochemistry influence the mechanical properties of the cell, we will discuss how cell properties can be measured experimentally and how they can be characterized in the form of equations. We will also study how mechanical environment, such as load, pressure, stress or strain, can influence the cell's shape and integrity, and eventually its biology and biochemistry.

- **Biomechanics (3)**

The biomechanics means the research and analysis of the mechanics and the application of engineering principles to and from biological systems. This lecture deals the analysis of joints, muscles, and bones of human body. The computer software for system integration is also studied.

- **Applied Haptic System (3)**

The haptic system is a tactile feedback technology that takes advantage of a user's sense of touch by applying forces, vibrations, and/or motions to the user. This lecture is composed of the theories for the haptic analysis and system integration technology.

- **Rehabilitation Engineering (3)**

Rehabilitation engineering is the systematic application of engineering sciences to analyze, design and develop the mechanisms and devices which can help individuals with disabilities. This lecture covers the rehabilitation theory and the system application.

- **Electrochemistry (3)**

In order to get insights on fundamentals of bioelectronics and related applications,

chemical reactions which take place in a solution at the interface of an electron conductor (a metal or a semiconductor) and an ionic conductor (the electrolyte), and which involve electron transfer between the electrode and the electrolyte or species in solution are studied. In detail, the scope includes the electrolysis in which a chemical reaction is driven by an external applied voltage to and the battery in which a voltage is created by a chemical reaction. Furthermore, fundamentals of semiconductor device physics will be covered for understanding the operation principles of nanoscale biosensor devices and circuits.

- **Bioinformatics (3)**

Bioinformatics is the application of techniques and theory in statistics and computer science to solve problems arising from the management and analysis of biological data such as nucleic acid(DNA/RNA) and protein sequences in the field of molecular biology. The primary goal of this course is to understand the computation techniques to process the biological data: sequence alignment, genome assembly, protein structure alignment, analysis of gene/protein expression, DNA chip, etc. The software tools and web services implementing the techniques are also covered in this course.

- **Medical Image Processing (3)**

This course presents the fundamentals of medical image processing. Topics include digital image fundamentals, image acquisition, image enhancement, image restoration, image segmentation, and image analysis. Students will develop practical experience through projects using the MATLAB Image Processing Toolkit.

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## Dept. of Sports Engineering Convergence

The Department of Sports Engineering Convergence (SEC) is established to train professionals who are interested in converging sport science to engineering. It provides a knowledge and skills of the exercise science and kinesiology as well as engineering in general, which are appropriate in applying to sports industry. The demand of sports industry is emerging in the area of health, safety, and environmental services anchoring kinesiology and mechanical engineering. While the sociocultural environment is ever changing, a demand of human oriented services, platform, hardware, and software are growing enormously. SEC focuses on training human resources targeting knowledge building, skill improvement, and field experiences. SEC offers two major fields; 'Convergence Kinesiology Major' and 'Convergence Mechanical Engineering Major'. Students are free to select one of the two majors, and will earn one of two academic degrees; 'Master of Science' or 'Master of Engineering'.

### ☐ Courses

#### ☐ Core Courses

- **Sports Science and Industrial Technology**

Understand the concept, relationship and application of sports, sports science, sports engineering and sports technology.

- **Sports Engineering Seminar I**

Topical issues worth sharing will be given for students.

- **Sports Engineering Seminar II**

Presentation and debates will be given for students.

- **Sports Industry Field Practice**

Students will experience dynamic aspects of sports industry and understand the practical demands of the business for sports engineering. Students are expected to gain field experiences at sports related locations.

- **Research Ethics & Thesis Study**

Students will understand research ethics which is required in dealing with humans in sports engineering and how they proceed a research thesis in the regards. Whether approaches of engineering toward social demands can correspond positively and

actively to agendas of sport ethics are examined. How competition and sportsmanship, gender equality and disability, ethics and cultural background, commercialization and sports values can be related to engineering will be studied.

❑ Convergence Kinesiology Major

- **Dynamics of Sports**

Mechanisms of human body dynamics related with sports and health care are studied. Understand the concept and application of the human movement mechanics for development and evaluation of various sports equipment.

- **Sports Media System**

Students will understand how the ever expanding media system in modern society would impact on sports and learn how the system could be applied to sports.

- **Sports Biomimetics**

Morphologic construction and ecological world of nature and human bodies are explored and studied. Possibility of application of natural structure on human body as well as on nature-friendly mechanical engineering is evaluated. Applicability of biomimetics on sports world will be assessed.

- **Big Data Analysis in Sports**

Through this course, it is able to obtain the knowledge of what the big data is in the multidisciplinary studies in sport, health, and rehabilitations. The students are able to apply the knowledge and skills of the big data analysis to the field by learning statistical analysis methods (e.g., R, SAS, etc) and theoretical models.

- **Sports Center Management Service Technology**

Students will understand importance of service management in sports center and learn what elements should be considered for effective center administration.

- **Research Methods in Sport Engineering**

Various research designs and methods applied in sport engineering are introduced

and practiced within the classes so that the students can conduct their own research studies.

- **Human Energetics**

The aims of this course are to understand energy system for movements of human body by applying metabolic changes and biochemical mechanisms to mechanical systems designed and to learn energy economics and nutritional benefits in mechanical systems based on the mechanisms.

- **Sports Wear**

This course is designed both for enrolled graduate students at sports engineering program in Kook-Min university and sportswear industry personnel. Students will learn to design sportswear (sports apparel, sports goggle, sports shoes. etc) based on functionality, human performance, aesthetic sense, and environmental challenges.

- **Sports Rehabilitation**

Students will learn how to rehabilitate various types of injuries and damages effectively which could be happened in sports field and what kinds of techniques and methods will be delivered for the purpose.

- **Sports Car**

Students will learn characteristics and functions of sports car and explore modality pursuing of the human safety and performance.

□ Convergence Mechanical Engineering Major

- **Sports Engineering Research**

Students will learn how to pull out research agenda which could be studied in sports engineering and learn how to solve the problems.

- **Trends in Sports Engineering**

Current trends of sports engineering including sports gear, equipments, and rehabilitation tools will be examined. Cutting edge ideas in academic and industrial terms will be discussed.

- **Rehabilitation and Robotics**

The state of art and core technology of rehabilitation Robots in the sports and medical fields are studied. And, motion of rehabilitation robots are studied based on the structure and movement of a human.

- **Mechanism Design for Sports and Rehabilitation**

The mechanism design for sports and rehabilitation is studied. Basic theory for the mechanism design is covered. The case studies for mechanism for sports and rehabilitation is introduced. The final term project should be carried for the mechanism design practice.

- **Sports Industry and IT Technology**

Students will learn how sports industry and IT technology could be converged and understand methods and techniques of field application.

- **Sports Industry and Electronic Engineering**

Students will learn how sports industry and electronic engineering could be merged and understand methods and techniques of field application.

- **Sports Bioengineering**

Basic theory, concept and terminology of biomechanics related with sports are introduced and how the theories of bio-solid and bio-fluid mechanics are applied on the bio-system and human body will be studied. Especially, the theme of contact mechanics which acted in human body or sports action will be studied.

- **Sports Sensor, Measurement and Analysis**

Based on the understanding for various sports related sensors and measurement techniques, the evaluation methods for body and sports performances are studied.

- **Sports Thermal Fluid Engineering**

Based on the theoretical understanding on the heat, energy and fluid drag force, student can learn about the design method to improve the efficiency of sport utility and the performance of competition ability.

- **Do-it-yourself for Sports Equipment**

This course deals with sports equipments in aspects of manufacturing engineering. Among the required features such as performance, aesthetic design, price-competitiveness, eco-friendliness, the course particularly focuses on price and safety. Designing and manufacturing experience in classroom, as termed as DIY (Do-it-yourself), will be attempted.

- **Design and Evaluation in Sports Equipment**

Mechanical designing techniques and evaluating methods for sports equipments will be reviewed in this course. Historical evolution and features will be discussed in the classroom.

- **Application of Advanced Materials in Sports Products**

Applications and case studies of advanced materials in sports- or health-related products are studied. The course deals with materials selection basing on the mechanical behavior of sports-related products such as elastic, plastic or failure-limited design. The case studies that how the advanced materials are contributed to improve the record of player will be also studied.

- **Sports Wearable Device**

The hardware and working principles of various sports and health related wearable devices are studied. Smart wearable coaching systems for the feedback coaching through expert systems can be designed and fabricated.

- **Sports Intelligent Design**

This course introduces recent theories and systems for sports related 3D solid modeling. We study the latest sports intelligent design techniques combining with information technologies such as an artificial intelligence and virtual reality applications.

- **Fitness Facility Design and Leveraging Technology**

Given in this course are planning, design, construction, maintenance, and management of sports facilities such as athletic ground tracks, swimming pool, and fitness room.

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