rgraduate/ Gra	Department	Semester	course name	Credi	Course Overview
Graduate	partment of Electronic Engineer	Subject to change	Emvedded Software	3	Based on understanding characteristics of NAND flash memory, explore an efficient design of SSD firmware such as flash translation layer (FTL) and buffer management.
Graduate	Department of Architecture	Spring semester	Introduction to Finite Element Method	3	It is necessary to use a commercial program because it requires a very complicated operation in order to interpret a building structure. In this course, we will learn how to use MATLAB program for structural analysis using finite element method and to apply it to structural analysis.
Graduate	Department of Architecture	Spring semester	Earthquake Engineering	3	1. Understand earthquake effects on structures and performance of steel buildings in past earthquakes 2. Learn about codes for seismic resistant steel buildings and building code philosophy and approach 3. Learn about basic behavior of steel seismic load resisting systems
Graduate	Department of Architecture	Fall Semester	Research Methodology	3	Research design is clear statement of researcher's idea and formulation of in-depth study topic related to general architecture.
Graduate	Department of Architecture	Spring semester	Architectural Design Theory	3	There are many architectural design theories in the world. For this class, we are going to adopt from Louis Khan's theory which was studied by professor, Kosama Hisaho, Tokyo University. Class would expand theory about surrounding space and concentration space with many examples. Student could get diversity of architectural vision and way to read architecture and environment.
Graduate	Department of Architecture	Fall Semester	Apprehension of Classical Architecture	3	Through Renaissance, classical architectural theories became more solid and refined. This course is about how classical architecture has played a pivotal role in making modern and contemporary architecture, and tries to find out if it is still valid in today's architectural discussion.
Graduate	Department of Architecture	Spring semester	Advanced Design of Steel Structures	3	The course will not attempt to teach the basic steel design, but will review undergraduate steel courses. The course focuses on understanding the background for steel design provisions and the behavior of steel structures rather than emphasizing the use of codes and specifications.

Graduate	Department of Automotive Engineer	Subject to change	Advanced Computational Fluid Dynamics	3	This CFD course is prepared for the postgraduate students to be able to undertake CFD calculations with the theoretical background. Aims: To develop in students a knowledge and appreciation ability of the theoretical approach for understanding of thermal and fluid flow phenomena in a real world. To encourage hands-on experimentation with wind-tunnel tests for the validation of the theoretical results to allow an understanding of these concepts and their range of applicability. The course is conducted in three ways; lecture for theory of CFD, Experimentation for Validation of Numerical Results, Team Projects for Hands on Study. (Main Lecture Contents) 1. General information of Fluid Dynamics and Thermodynamics (Conservation of mass, momentum and energy) 2. Integral & Differential Approach of Fluid Flow 3. Turbulence and Mathematical Models 4. Wind Tunnel Test for Validation of CFD Results 5. Finite Volume Method for Diffusion Problem 6. Solution Algorithm for Pressure-velocity Coupling in Steady Flow 7. Implementation of Boundary Conditions 8. Numerical Data Analysis
Graduate	Department of Chemical Engineer	Subject to change	Biochemical Engineering	3	This course focuses on the interaction of chemical engineering, biochemistry, and microbiology. From the basic knowledges about biology, such as DNA, proteins, and cells, mathematical representations of continuous fermentation, agitation, mass transfer, and enzyme technology are also covered.
Graduate	Department of Civil Engineering	Subject to change		3	The field of hydrology is of fundamental importance to civil and environmental engineers because of the environmental significance of water supply, major floods and droughts and their management, drainage and urban stormwater issues, floodplain management, and water quality impacts. In recent years, hurricanes and storm surge have contributed significantly to urban disasters, especially along coastal areas where urban development has expanded rapidly.
Graduate	Department of Civil Engineering	Subject to change	Water Resources Engineering	3	Hydrological events such as precipitation, floods, and droughts are inherently random by nature. Due to the complexity of the hydrologic system, these physical processes are not fully understood and reliable deterministic mathematical models are still to be developed. Therefore, in order to provide useful analyses for designing hydraulic facilities and infrastructures, statistical approaches have been commonly adopted. This course includes probability and statistics in hydrology and hydrological drought.

Graduate	Department of Civil Engineering	Subject to change	Finite Element Analysis in Geomechanics	3	This lecture provides a principle introduction to Numerical Modelling of Geotechnical Engineering, and provides the fundamental theories necessary for the detailed study of Numerical Modelling of Geotechnical Engineering. This lecture aims to provide an understanding of: constitutive models; determination of material parameters; non-linear analysis; modelling structures and interfaces; boundary and initial conditions; guidelines for input and output; modelling specific types of geotechnical problems, limitations and pitfalls in full numerical analyses; benchmarking.
Graduate	Department of Civil Engineering	Subject to change	Tunnel and Underground Space Technology	3	This lecture provides various tunnel construction methods, reinforcement methods, and theory of ground behaviour due to tunnelling subjected to various ground conditions. Through that post-graduate students may apply their tunnel knowledge to real and practical tunnelling problems in the field.
Graduate	Department of Civil Engineering	Subject to change	Deterministic hydrology	3	The field of hydrology is of fundamental importance to civil and environmental engineers because of the environmental significance of water supply, major floods and droughts and their management, drainage and urban stormwater issues, floodplain management, and water quality impacts. In recent years, hurricanes and storm surge have contributed significantly to urban disasters, especially along coastal areas where urban development has expanded rapidly.
Graduate	Department of Civil Engineering	Subject to change	Water Resources System Engineering	3	This class aims to introduce the Water Resources Systems Engineering using optimization techniques and multi-criteria decision making methods. It consists of flood vulnerability assessment, group decision making methods, social choice methods, conflicts resolution methods among stakeholders, climate change adaptation and robust decision making for climate change.
Graduate	Department of Civil Engineering	Subject to change	Integrated Water Resources Management	3	Integrated Water Resources Management (IWRM) is a A management process which promotes the coordinated development and management of water, land and related resources, in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems (Global Water Partnership, 2005). IWRM is not an end in itself but a means of achieving three key strategic objectives: the Three Es' which are (economic) Efficiency, (social) Equity, and Environmental sustainability (GWP, 2003). This class will include basic principles and various applications of IWRM and all related knowledge and information.

Graduate	ent of Electronic and IT Media Er	Spring semester	Technology for Broadcasting and Comm	3	In this course, we cover error control techniques which is indispensable to the digital broadcasting and communications systems. In general, the codec techiques include source coding (compression) and channel coding (error correction). We mainly cover the error control techniques incluing error corrcting codes (ECC) and retransmission techniques for the reliable transmission. The student for this lecture will learn the basic theory of ECC including finite field theory etc. Also they will increase their capability of system analysis and evaluation with MATLAB or C-Languages.

Graduate	of Electronical and Information	Spring semester	Advanced Servo Controller Design	3	At the end of this course, students will be able to:
					Understand basic configuration of a high performance AC servo systems
					Understand the principles of electric drive systems and fundamentals of inverter drive scheme
					Design a servo drive system including power electronics circuits
					Identify servo system configuration and design the controller
					Apply digital control scheme to servo control system design
					Simulate a servo control system using Simulink, PSIM, and Visual-C language
					
					▪ Course Description
					  Electric drive system - fundamentals and overviews
					  Servo controller design - theory
					  AC servo motor controller design
					  Simulation of AC Servo motor controller design using Matlab - Simulink
					  Simulation of AC Servo motor controller design using C-language
					  Study of Microprocessor or DSP-based implementation
					  Power electronics converter
					  Analysis and 3-phase converter and inverter
					  Simulation of power electronics converter using PSIM
					  Digital control applications

Graduate	of Electronical and Information	Subject to change	Advanced Intelligent Systems	3	This lecture deals with artificial neural network and its application.
Graduate	of Electronical and Information	Spring semester	Machine Vision	3	Introduction to computer vision. Image formation. Camera imaging geometry, Feature detection and matching, Tracking and detection, Image deep learning architectures and learning algorithms. Applications to vision
Graduate	of Electronical and Information	Spring semester	Machine Learning	3	Introduction to pattern recognition and machine learning. Decision functions. Statistical pattern classifiers. Generative vs. discriminant methods for pattern classification. Regression. Unsupervised learning. Clustering. Applications of machine learning
Graduate	of Electronical and Information	Spring semester	Linear Systems Theory	3	This lecture introduces fundamentals of linear algebra, linear systems theory, and linear control design.
Graduate	of Electronical and Information	Fall Semester	formation and Communication Engineeri	3	This course introduces various theories, which are exploited to design and analyze the information and communication systems. This course presents wireless channel model, modulation, detection theories, channel coding, and multiple access schemes. Additional topics such as OFDM and MIMO techniques will also be discussed.

Graduate	of Electronical and Information	Spring semester	F/Analog Integrated Circuits and System	3	This course focuses on the introduction to RF and analog integrated circuits based on CMOS semiconductor technology. We will look at basic concepts in RF design (noise and nonlinearity consideration), wireless transceiver architectures, RF circuit blocks such as LNAs, mixers, and oscillators
Graduate	of Electronical and Information	Subject to change	Microwave Engineering	3	The course mainly deals with the fundamental theories and applications of microwave passive devices such as transmission lines, microstrip lines, isolators, transformers, couplers, filters, etc. It is presumed that the student has attended a basic level electromagnetic courses in the past.
Graduate	of Electronical and Information	Subject to change	ctromagnetic Interference and Compatib	3	The course deals with the theory behind EMI/EMC problems and their solutions. The importance of solving EMI/EMC problems will be highlighted and the state-of-the-art solutions will be discussed based on practical examples. The course also includes recent EMI/EMC testing and certification methods.
Graduate	of Electronical and Information	Subject to change	Antenna Engineering	3	The course mainly deals with antenna fundamentals and their applications in wireless communication systems and devices. The topics included are antenna radiation theory, antenna parameters (polarization, gain, efficiency, impedance, losses), antenna array design, antenna types, path loss and link budget analysis, measurements, and recent research topics.
Graduate	of Electronical and Information	Fall Semester	Advanced Applied Mathematics	3	This lecture deals with advanced mathematics for electrical engineering research.
Graduate	of Electronical and Information	Fall Semester	oduction to Integrated Circuits and Syste	3	This course focuses on analog integrated circuits with an emphasis on CMOS semiconductor technology. We will focus on overview of IC technology, MOS device physics, basic MOSFET circuit blocks such as amplifiers, current mirrors, filters.
Graduate	of Electronical and Information	Spring semester	Microgrid Engineering	3	Microgrid, the research on which has been actively conducted, is a small-sized electrical power system. In smart grid technology, it is has been recognized as one of the cells, and it is a system unit that requires distributed generation of energy technology and ICT-based communication and control technology. In this course, we discusses the strategy and the stable operation of the microgrid technologies combined with the penetration of renewable sources and the role of battery energy storage.
Graduate	of Electronical and Information	Fall Semester	Convergence Power Conversion Engine	3	The steady growth in electricity demand and the depletion of fossil energy have been creating an increased interest in the renewable energy resources and construction of microgrid. Moreover, to accelerate the economy and stability of operating power systems, the injected renewable energy into the grid by means of the distributed generation system has been shooting up in the last decade. This lecture deals with power conversion, control, implementation, and some important issue for distributed generation power system. Understand basic configuration of a high performance servo systems and power conversion circuits Understand the principles of electric drive systems and fundamentals of inverter drive scheme Design a servo control system including power electronics circuits Identify servo system configuration and design the controller Apply digital control scheme to servo control system design Simulate a servo control system and power conversion circuits using Simulink, PSIM, and Visual-C language

Graduate	of Electronical and Information	Fall Semester	Robust Control Theory	3	The objective of this lecture is to teach students how to design a controller for uncertain linear systems in such a way that closed-loop systems become robust against model. Students learn how to run computer simulations of robust control.
Graduate	of Electronical and Information	Fall Semester	System Control and Optimization	3	This lecture aims to study basic optimization theory and its application to optimal control design. To this end, students learn convex functions, optimality condition, and dynamic programming. Students practice various optimization algorithm using Matlab simulation
Graduate	of Electronical and Information	Fall Semester	ess Communications in Unlicensed Spe	3	In this course, we study the characteristics of unlicensed spectrum and how to design wireless systems for unlicensed spectrum. The design factors of wireless systems to be covered in the course include access mechanism, energy efficiency, networking, coexistence of heterogeneous systems, etc. To evaluate wireless systems for unlicensed spectrum, we also study simulation techniques. In a term project, students exploit these to evaluate the performance of a given system.
Graduate	of Electronical and Information	Subject to change	Special topics in antenna design	3	The course mainly deals with antenna fundamentals and advanced design techniques to fullfill typical applications such as handsets, low profile, multiple-input-multiple-output capability, arrays, circularly polarized antennas, multiband and wideband antennas, etc. The students will have a chance to use computer simulation tool to design antenna as a term project. Also, a seminar presentation will be assigned to the students to share recent technologies in antenna design.The course mainly deals with antenna fundamentals and advanced design techniques to fullfill typical applications such as handsets, multiple-input-multiple-output capability, circular polarization, multiband, wideband, low profile, etc. The students will have a chance to use computer simulation tool to design antenna as a term project. Also, a seminar presentation will be assigned to the students to share recent technologies in antenna design.
Graduate	of Electronical and Information	Subject to change	ial topics in passive microwave circuit d	3	The course aims to learn advanced and practical design techniques for passive microwave circuit components. It includes iterature studies on recent 2-, 3-, 4-port component design techniques and their characteristic measurements. It is presumed that the student has attended a basic level electromagnetic courses in the past.
Graduate	of Electronical and Information	Spring semester	n Control Application and Simulation for	3	At the end of this course, students will be able to : Understand basic configuration of a high performance servo systems and power conversion circuits Understand the principles of electric drive systems and fundamentals of inverter drive scheme Design a servo control system including power electronics circuits Identify servo system configuration and design the controller Apply digital control scheme to servo control system design Simulate a servo control system and power conversion circuits using Simulink, PSIM, and Visual-C language
Graduate	rtment of Energy System Engine	Fall Semester	Finite Element Analysis for Fluid Flow	3	In this lecture, the systematic approach to solve various partial differential equations of fluid flows by Finite Element Method will be taught. In the first quarter of the lecture, basic knowledge of FEM will be taught. It includes 'Galerkin Finite Element Formulation' and 'Assemble of Global matrix' and some pre&post processings of FEM. In the last of lecture, some application of FEM to various fluid engineeringproblems will be discussed.

Graduate	artment of Intergrated IT Engine	Subject to change	Introduction to IT Convergence	3	This Course introduce about IT Convergence Technology with field Technology
Graduate	artment of Intergrated IT Engine	Subject to change	IoT/IoL Communication Technology	3	This lecture discusses communication systems using IoT and light source based IoL technology
Graduate	artment of Intergrated IT Engine	Subject to change	IoT/IoL Application Services Design	3	This Cousre deals with the theory about IoT/IoL Application Services and Design System
Graduate	artment of Intergrated IT Engine	Subject to change	LED-ID and LiFi Convergence Technolo	3	This lecture discusses advanced theory and analysis of LED-ID technology and LiFi technology.communication systems and devices. The topics included are antenna radiation theory, antenna parameters (polarization, gain, efficiency, impedance, losses), antenna array design, antenna types, path loss and link budget analysis, measurements, and recent research topics.
Graduate	artment of Intergrated IT Engine	Subject to change	vanced Wireless Communication Syster	3	In the hyper-connected world, the importance of mobile communication technology is emerging rapidly. This course deals with various technologies of mobile communication which is the core of information communication.
Graduate	artment of Intergrated IT Engine	Subject to change	Microwave Engineering	3	The course mainly deals with the fundamental theories and applications of microwave passive devices such as transmission lines, microstrip lines, isolators, transformers, couplers, filters, etc. It is presumed that the student has attended a basic level electromagnetic courses in the past.
Graduate	artment of Intergrated IT Engine	Subject to change	ctromagnetic Interference and Compatibi	3	The course deals with the theory behind EMI/EMC problems and their solutions. The importance of solving EMI/EMC problems will be highlighted and the state-of-the-art solutions will be discussed based on practical examples. The course also includes recent EMI/EMC testing and certification methods.
Graduate	artment of Intergrated IT Engine	Subject to change	Antenna Engineering	3	The course mainly deals with antenna fundamentals and their applications in wireless communication systems and devices. The topics included are antenna radiation theory, antenna parameters (polarization, gain, efficiency, impedance, losses), antenna array design, antenna types, path loss and link budget analysis, measurements, and recent research topics.
Graduate	artment of Intergrated IT Engine	Subject to change	Special topics in antenna design	3	The course mainly deals with antenna fundamentals and advanced design techniques to fullfill typical applications such as handsets, low profile, multiple-input-multiple-output capability, arrays, circularly polarized antennas, multiband and wideband antennas, etc. The students will have a chance to use computer simulation tool to design antenna as a term project. Also, a seminar presentation will be assigned to the students to share recent technologies in antenna design.The course mainly deals with antenna fundamentals and advanced design techniques to fullfill typical applications such as handsets, multiple-input-multiple-output capability, circular polarization, multiband, wideband, low profile, etc. The students will have a chance to use computer simulation tool to design antenna as a term project. Also, a seminar presentation will be assigned to the students to share recent technologies in antenna design.
Graduate	artment of Intergrated IT Engine	Subject to change	ial topics in passive microwave circuit d	3	The course aims to learn advanced and practical design techniques for passive microwave circuit components. It includes iterature studies on recent 2-, 3-, 4-port component design techniques and their characteristic measurements. It is presumed that the student has attended a basic level electromagnetic courses in the past.

Graduate	of Mechanical Design and Robo	Subject to change	Advanced Robotics	3	This course covers intelligent robotics modeling, model based control, image processing, and self location identification, etc. Particularly, schemes and techniques on 3D location estimation using binocular cameras will be included. Modern technologies on robotics will be introduced and group presentation and dicussion will be also arranged.
Graduate	partment of Mechanical Enginee	Subject to change	Plasticity	3	This course deals with some important topics in plasticity. The primary goal is not only to offer the continuum approach, but also to offer a foundation of researches in recent developments in the field of plasticity.
Graduate	partment of Mechanical Enginee	Subject to change	Advanced Optics	3	This course is intended to introduce advanced science and engineering knowledge involved in Optics related to mechanical engineering. The following topics are to be covered: Geometry optics and Physical optics (Interference, Diffraction, Fresnel Eq. etc)
Graduate	partment of Mechanical Enginee	Subject to change	Fracture Mechanics	3	This course deals with fundamental theories and topics in fracture mechanics. The primary goal is not only to offer physical and mathematical expressions related to fracture mechanics, but also to offer a foundation of advanced researches in the field of fracture mechanics.
Graduate	partment of Mechanical Enginee	Subject to change	Nonlinear Computational Solid Mechanics	3	This course deals with some important topics in theories and methodologies in solving nonlinear problems in solid mechanics. Topics covered include: (1) theories in nonlinear solid mechanics, (2) theory of plasticity, (3) nonlinear finite element formulations, (4) solution methods and stability,
Graduate	partment of Mechanical Enginee	Subject to change	Introduction to Parallel computing	3	With the development of many-core computers, computation technique to use multi-cores beomes important and popular.Some techniques to solve very big matrices are taught. Main topics are (1)Parallel computation by shared memory(Open-MP) (2)Parallel computation by distributed memory(MPI) (3)Domain decomposition algorithm for distributed memory
Graduate	partment of Mechanical Enginee	Fall Semester	Advanced Solid Mechanics	3	This course deals with some important topics in solid mechanics. The primary goal is not only to offer the continuum approach, but also to offer a foundation of researches in recent developments in the field of solid mechanics.
Graduate	partment of Mechanical Enginee	Spring semester	anced Computational Analysis of Structu	3	This course deals with some advanced topics in Finite Element analysis of structures. The primary goal is not only to offer the theory of FEM, but also to offer a foundation of researches in the field of computational mechanics.
Graduate	partment of Mechanical Enginee	Fall Semester	Advanced Measurement Engineering	3	This course is based on intelligent measurement engineering that is a course for undergraduate students. Graduate students will learn an advanced technology on measurement and sensors. In detail, principles and fundamental theories of measurement are studied for nano-scale measurement w/ high resolution. Especially, the recent technology of optic based sensors will be taught. Finally, students will know how to design, manufacture, test and use several the optic based sensor.
Graduate	epartment of Media IT Engineeri	Subject to change	Ubiquitous Sensor Network Technology	3	This course will be lectured on the latest technology U-sensor networks commercialization is going briskly in recent.

Graduate	epartment of Media IT Engineeri	Subject to change	Special Topics on LED-IT Convergence	3	This course is designed to educate the various application that can be derived from convergence of LED and IT technologies, which are the lighting source devices that can be used to contacted anytime and anywhere
Graduate	epartment of Media IT Engineeri	Subject to change	Special Topics on IoT/IoL Convergence	3	The IoT(Internet of Things) and IoL(Internet of Lights), which are emerging as next generation smart network technologies, By educating the cases on various application technologies, we have developed the industry-technology convergence IT new technology talent oriented in various industries.
Graduate	Department of Optometry	Spring semester	Surface and Interfacial Science	3	Introduction of Material Science will be carried out in this course including is an introduction to three topics fundamental to materials science and engineering: structure, bonding, and thermodynamics. Graduate Seminar Style course that emphasizes discussion and participation. Solidify grasp of core concepts Preparation for candidacy/comprehensive/defense exams Questions, in-class exercises, student projects
Graduate	Department of TESOL	Fall Semester	English Phonology	3	Phonetics and phonology are the two subfields of linguistics which deal with speech sounds. This course is designed to provide students with major topics of articulatory and acoustic phonetics. Students will read and discuss a wide variety of texts on the classification of speech sounds, suprasegmental features, speech production, etc.
Graduate	Department of TESOL	Spring semester	English Teaching Methods	3	The purpose of this course is to provide basic and advanced principles of language learning and teaching theories and methods to future and current language teachers so that they can utilze them in devising the most appropriate teaching methods in accordance with the learners and teaching contexts.
Graduate	Department of TESOL	Fall Semester	A Study on Language Acquisition	3	The purpose of the course is to inform students of the basic theories of second language acquisition. So, the course covers first language acquisition, the individual differences associated with second language acquisition, classroom learning and othre variables related to the second language acquisition. Students should be required to read the main textbooks and take active part in the classroom activities.
Graduate	Department of TESOL	Fall Semester	Research on Media English	3	This course is designed to provide students with theoretical and applicable knowledge and practice in the field of Media English. The course will offer various Media English materials including news which will give students an opportunity to analyze and research into authentic Media English in depth. Class will be conducted in English and students are encouraged to actively participate and communicate in class.
Graduate	바이오소재융합협동과정(융합ㅍ	ing and Fall Semes	Biomaterials Science and Technology	3	This course covers diverse of biomaterials for their applications in biomedical industry such as metal, ceramics and polymers. Polymeric biomaterials will be discussed mainly.
Graduate	바이오소재융합협동과정(융합ㅍ	ing and Fall Semes	rgence Engineering and Creativity Devel	3	This course will cover the main and essential issues in convergence of the science and enginering by converging of natural sciences and medical materials as well as clinical aspects.
Graduate	바이오소재융합협동과정(융합ㅍ	ing and Fall Semes	Intyroduction to biomedical engineering	3	This course will introduce students to the basic scientific, clinical and engineering concepts of biomedical engineering, biomaterials and tissue regenerations.

Undergraduate	al Design Course-the School of /	Spring semester	Architectural Design 1	6	The design studio experiments the principles of spatial component and substantial relationships among physical, visual, human behavior, and built environment, which is considered at the design process of single family house in a given context. This studies abstract and real existence method, which is explored as conceptual language through the design process with the linkage of architectural space, form, and structure; circulation or visual movement and interruption, surface and structure as a focal point, horizontal and vertical accessibility, tracing and expression of thinking or formative transition, metamorphosis, linkage and boundary of forms and space, linkage.
Undergraduate	al Design Course-the School of /	Spring semester	Architectural Design 3	6	The design studio experiments the principles of spatial component and substantial relationships among physical, visual, human behavior, and built environment, which is considered at the design process of K-12 Educational Facilities. This studio also include the studies of circulation or visual movement, materials of surface and structure, horizontal and vertical accessibility, flexibilities of each space and space group, and environment design.
Undergraduate	al Design Course-the School of /	Fall Semester	Architectural Design 2	6	This course is meant to contribute to and deepen your understanding of architectural design, mainly mixed-use design: neighborhood retails and multi-family housing.
Undergraduate	al Design Course-the School of /	Spring semester	History of Western Architecture	3	This course will identify wide variety of architectural events and associated architects in Western Europe from the antiquity to the arrival of modernism in the nineteenth century.
Undergraduate	al Design Course-the School of /	Fall Semester	Architectural Computing 2	3	The scope of architectural computer design includes various fields ranging from CAD to image processing and three-dimensional design. BIM is taught in this course. Bilding Information Modeling has the characteristics of working with two dimensional drawings and three dimensional modeling at the same time and can review errors in design or construction process in advance. Through this course, students will be able to develop their ability to carry out integrated architectural design.
Undergraduate	al Design Course-the School of /	Fall Semester	Architectural Design 4	6	Studio is going to design 300 unit apartment housing project. In a early stage of semester, each team study type of apartment housing and search several prototype case project. During second stage of semester, studednts develope unit plans and block plans which could be considered with size of family and type of life syle. For final solution, each team makes a intergrated design with ulban responsibility, vertical and horizintal transportaion system and environmental consideration
Undergraduate	al Design Course-the School of /	Spring semester	Architectural Planning & Development	3	Architectural planning on specific project followed by real estate development is the continual reconfiguration of the built environment to meet society's needs. In typical development process, initial integrated and well organized planning and programming research before design development is crucial to the success of a project. For this purpose, this course will focus on the definition of real estate development, role of development team and partnership, development model, understanding the relation between architecture and real estate market, marketing analysis, financial feasibility analysis and brief project reports. In particular, in-depth real estate marketing analysis and financial feasibility study are the pivotal elements, extending the field of architectural profession while working as a key issue in the success of development. Further, knowledge of legal context and building codes/zoning regulations will add the practical application.

Undergraduate	al Design Course-the School of	Spring semester	Presentation Skill & Drawing	3	This course introduces the fundamental concept of architectural drawings in both two and three dimensional presentation for the first year students. Students are expected to understand building design process and the meaning of form and function in architectural design through exercising and studying drawings, presentation, reference materials a nd three dimensional design practice.
Undergraduate	al Design Course-the School of	Fall Semester	Global Architecture	3	This elective course will identify wide variety of historical architectural events and associated phenomena in global context. From the antiquity to the arrival of modernism in the nineteenth century, studies on architectural events and associated architects are limited to Western hemisphere or Western tradition. This course intends to shed a light on architectural heritage in non-Western world where important buildings and local histories are largely remain marginalized. For the autumn of 2017, this course especially pay attention on South Asian building history and continuing traditions in building customs and technology.
Undergraduate	al Design Course-the School of	Spring semester	Architectural Presentation	3	This course explores camera technology (photography) as representation method, and tries to understand andpractice essentials of camera techniques. The course further incorporates photographic images into architecturalpresentation skills. The course explores both digital and film media. Any 35 mm film or digital camera will be OK;Medium sized or larger formats are also OK. A standard SLR or Range-finder Devices with adjustable focus andexposure capability is recommended for use.
Undergraduate	al Design Course-the School of	Spring semester	Modern Architecture	3	This course will identify major architectural events and associated architects in Western Europe and North America from the Industrial Revolution until the end of the Second World War.
Undergraduate	al Design Course-the School of	Fall Semester	Architectural Aesthetics	3	This course aims to provide conceptual and empirical platform for the apprehension of the art of building. Classical and modern theories of architecture are studied and experience of particular environment is attempted to better understand architecture within which we maintain our lives. Architecture is understood as both visual and non-visual work.
Undergraduate	al Design Course-the School of	Fall Semester	Architectural Case Design	3	The brief overview of the class is to analyze the works of renowned architects from multiple perspectives and enables them to experience excellent works according to architectural elements or comprehensively.
Undergraduate	al Design Course-the School of	Spring semester	Architectural Computing 2	3	In the process of architectural design, the architect presents his or her design concept / design strategy to the owner. This process is carried out through the entire design process from pre-design to construction documents. At each phase of design, the architect utilizes numerous architectural expressions to present and highlight key features of the design to the owner. This course will review various digital architectural expressions used in architectural design.

Undergraduate	al Design Course-the School of	Spring semester	Architecture Design Studio 1	6	The design studio experiments the principles of spatial component and substantial relationships among physical, visual, human behavior, and built environment, which is considered at the design process of single family house in a given context. This studies abstract and real existence method, which is explored as conceptual language through the design process with the linkage of architectural space, form, and structure; circulation or visual movement and interruption, surface and structure as a focal point, horizontal and vertical accessibility, tracing and expression of thinking or formative transition, metamorphosis, linkage and boundary of forms and space, linkage.
Undergraduate	al Design Course-the School of	Spring semester	Architecture Design Studio 3	6	The design studio experiments the principles of spatial component and substantial relationships among physical, visual, human behavior, and built environment, which is considered at the design process of K-12 Educational Facilities. This studio also include the studies of circulation or visual movement, materials of surface and structure, horizontal and vertical accessibility, flexibilities of each space and space group, and environment design.
Undergraduate	al Design Course-the School of	Fall Semester	Architecture Design Studio 2	6	This course is meant to contribute to and deepen your understanding of architectural design, mainly mixed-use design: neighborhood retails and multi-family housing.
Undergraduate	al Design Course-the School of	Fall Semester	Advanced Design Studio 1	6	Studio is going to design 300 unit apartment housing project. In a early stage of semester, each team study type of apartment housing and search several prototype case project. During second stage of semester, studednts develope unit plans and block plans which could be considered with size of family and type of life syle. For final solution, each team makes a intergrated design with ulban responsibility, vertical and horizintal transportaion system and environmental consideration
Undergraduate	al Design Course-the School of	Spring semester	Advanced Design Studio 2	6	In this studio, students will explore urban design and it's processes in close relationship with building design. Based on the urban design methodology, students can popose architectural concepts and building designs.
Undergraduate	Engineering Course-the School	Spring semester	Architectural Computer Programming	3	Architectural Computer Programming class deals with the computer technology to solve the engineering problems in achitectural field. It will include the grammar and syntax of computer programming language to cultivate the programming ability through practical exercises. Particularly, this class focuses on learning the programming knowledge that can control the building with micro-computer hardware.
Undergraduate	Engineering Course-the School	Spring semester	Architectural BIM	3	This class deals with the BIM tools needed to apply computers to architectural engineering. Students will acquire the knowledge to utilize the BIM(Building Information Modeling) to make 3D model, draft production, material-takeoff, basic building energy anlaysis, and design presentation using 3D modeling. Also, the students will experience the VR and AR applications using BIM data as the extention of computer application in BIM.
Undergraduate	Engineering Course-the School	Fall Semester	HVAC System for Buildings	3	This module is designed to develop knowledge in theory, method and equipment for controlling indoor thermal environment(temperature, humidity, air quality). Thermophysical property table, equation of state, psychrometric chart and EES(Engineering Equation Solver) are learned for analyzing moist air, heating and cooling loads, and HVAC(Heating, ventilating and air-conditioning) process.
Undergraduate	Engineering Course-the School	Spring semester	Creative Engineering Design	3	This course provides students for basic process of engineering design required for flexible and various problems solving approach as well as a basic design knowledge af for engineers who find out creative solutions for the given problems.

Undergraduate	Engineering Course-the School	Spring semester	General Building Structure	3	1. To know building components(wall, floor, beam, column, roof etc.) focused on structures 2. To understand building materials, structures and construction 3. To learn about construction that is related to engineering practice 4. To learn about materials that is useful to structural engineers
Undergraduate	Engineering Course-the School	Fall Semester	Introduction to Building Structures	3	In this course, basic structural theory will be covered in order to develop basic knowledge for the field of architecture. From the basic concept of the load to the prediction of the structural behavior of a simple building, we predict the flow of force and practice the calculation of the stress using simple equations. In addition, students will design and fabricate the simplest structure, and perform fracture test. The load resistance mechanism in the structure is directly identified by this test.
Undergraduate	Engineering Course-the School	Spring semester	Introduction of Thermal Engineering	3	This module is designed to develop knowledge in thermodynamic properties, state, equilibrium and their correlations. Relation between work and heat are introduced. Laws of thermodynamics, processes and cycles are studied.
Undergraduate	Engineering Course-the School	Fall Semester	nd Assessment Engineering of Construct	3	This class provides students to lots of knowledge to understand various properties of materials and also they will have a chance to experiment concrete mixing and finally, experimental reports from data analysis will be presented at the end of term
Undergraduate	Engineering Course-the School	Spring semester	Structural Planing of Architecture	3	1. A brief review of basic concepts in physics. 2. Fundamental concepts in forces, motion, and material behavior. 3. Behavior and design of structural elements and principles of connections. 4. Behavior and design of basic system types: trusses, cables, arches, and frames.
Undergraduate	Engineering Course-the School	Fall Semester	Theory of Steel Structures	3	This course covers design of structural steel elements, including tension members, compression members, flexural members, and basic structural connections with welds and bolts.
Undergraduate	Engineering Course-the School	Spring semester	reative Engineering Design for Architectu	3	This course provides students for basic process of engineering design required for flexible and various problems solving approach as well as raising a basic design knowledge as for engineers who find out creative solutions for the given problems. Also, students learn multi-design methods of idea development and method of delivering from teamworks and brainstorming including presentation skills resulting from multi-projects.
Undergraduate	Engineering Course-the School	Spring semester	ructural Materials for Building Constructi	3	- Concrete''s versatility, durability, and economy have made it the world''s most used construction materials. '- Other construction materials (stone, timber, steel, glass, soil etc.) are also important in construction field. '- This class provides students to lots of knowledge to understand various properties of materials and also they will have a chance to experiement concrete mixing and finally, experimental reports from data analysis will be presented at the end of term.
Undergraduate	Business Administration	Subject to change	Financial Markets, Institutions, and Money	3	This course is intended to help you understand the role of financial institutions and markets play in the business environment that you will face in the future. It also helps you to develop a series of applications of principles from finance and economics that explore the connection between financial markets, financial institutions and the economy. On the financial markets side, we will learn the term structure of interest rates, stocks, principals of derivatives, and currencies.

Undergraduate	Business Administration	Fall Semester	Business Calculus	3	We will learn mathematical background and techniques, which are required to learn major courses. We are going to emphasize on mathematical idea to solve problems. Especially, we will study the limit, differentiation, and integration of one & several variables functions. We also deal with applications of them and Lagrange Multipliers.
Undergraduate	Business Administration	Spring semester	Marketing Management	3	In this comprehensive and practical introduction to marketing management, students improve their ability to make effective marketing decisions, including assessing marketing opportunities and developing marketing strategies and implementation plans.
Undergraduate	Business Administration	Fall Semester	Strategic Management	3	This course focuses on some of the important current issues in strategic management. It will concentrate on modern analytical approaches and on enduring successful strategic practices. It is consciously designed with a technological and global outlook since this orientation in many ways highlights the significant emerging trends in strategic management. The course is intended to provide the students with a pragmatic approach that will guide the formulation and implementation of corporate, business, and functional strategies.
Undergraduate	Business Administration	Spring semester	ntrepreneurship and New Venture Creati	3	This course examines successful strategies, business models, frameworks, funding, barriers and risks for introducing break-through products and services. Topics include business model innovation, strategic leadership, human centered and design-driven innovation, knowledge and change management.
Undergraduate	Business Administration	ing and Fall Semes	Financial Management	3	This is an introductory course in corporate finance. Emphasis will be placed on appreciating the limitations and challenges that are faced when applying the theoretical framework of corporate finance to real world problems.
Undergraduate	Business Administration	Fall Semester	Organizational Behavior	3	This course is designed to expose you to important theories and conceptual models for analyzing, understanding, and managing human behavior within organizations. In this seminar, we will study a wide range of organizational situations and examples of human behavior, and connect them to foundational theories and effective practical management methods.
Undergraduate	Business Administration	Fall Semester	Principles of Accounting	3	This course is an introduction to the basic concepts and standards underlying financial accounting systems. The course emphasizes the construction of the basic financial accounting statements - the income statement, balance sheet, and cash flow statement - as well as their interpretation.
Undergraduate	Business Administration	Spring semester	Operation Management in Service	3	The course will be taught using case studies, guest speakers, and two small student-based projects. The projects will require you to go to the "gemba," the source, to study organizations of your own choice
Undergraduate	Business Administration	Fall Semester	Investments	3	This course focuses on investment principles and their application to various types of investments available in the marketplace today. This knowledge is essential for a full understanding of other areas of finance such as portfolio management, corporate finance, and risk management.
Undergraduate	Business Administration	Fall Semester	Corporate Risk Management	3	This course introduces you to financial risk management from the perspective of non-financial corporations. Successful completion of the module should equip you with the right tools and insights to manage risk in a corporate setting. You will learn why firms should or should not manage risk, whether they do manage risk, and how to measure and manage risk.

Undergraduate	Business Administration	Spring semester	Principles of Insurance	3	This course intends to provide a basic understanding of the insurance mechanism. It explains the concept of insurance and how it is used to cover risk. How insurance is transacted as a business and how the insurance market operates are also explained. The relationship between insurers and their customers and the importance of insurance contracts are discussed.
Undergraduate	Business Administration	Spring semester	Human Resource Management	3	The human resource function of modern organizations is critical, as people are our most important resource. The course is a graduate level survey of principles, practices, theory, and current issues facing organizations as related to attracting, selecting, and maintaining a productive workforce in today's competitive operating environment.
Undergraduate	Business Administration	Spring semester	Financial Accounting	3	This course revisits topics covered in Introductory Financial Accounting (Accounting 101), with a focus on the asset side of the balance sheet. The course also covers revenue and expense recognition issues, and generally accepted accounting principles that affect the format and presentation of the financial statements.
Undergraduate	Business Administration	Fall Semester	Intermediate Accounting	3	Covers liabilities and equities, especially long-term debt, convertible securities, equity issuance, dividends, share repurchases, employee stock options, pensions, leases, deferred tax, and derivative securities. Related topics covered include computation of diluted earnings per share, disclosure issues, earnings management, and basic financial statement analysis of cash flows.
Undergraduate	Business Administration	Spring semester	Cost & Management Accounting	3	The first part of the course presents alternative methods of preparing managerial accounting information, and the remainder of the course examines how these methods are used by companies.
Undergraduate	Business Administration	Spring semester	International Business	3	This course explores challenges facing modern corporations in organizing cross-border activity that spans multiple stages of the value chain. The course contains several modules, including (but not limited to): Institutional theory and comparative management; theories of firm boundaries; management of inter-firm supply networks across national borders; markets for technology and the changing division of innovative labor in industry value chains.
Undergraduate	Business Administration	Spring semester	Statistics for Business	3	This is a course in the basic statistical concepts and methods common in business applications. The emphasis is on parametric techniques used to describe and compare samples and populations. The goal is to introduce you to a new way of thinking about data, and to help you gain an understanding of how to use, communicate, and interpret statistics.
Undergraduate	artment of Ceramic Arts and De	Spring semester	Intermediate Ceramic Sculpture(1)	3	Explores a variety of ceramic processes and conceptual development by Understand and reinterpret the basic construction of material. Study a new possibility of ceramic sculpture through using various materials.
Undergraduate	artment of Ceramic Arts and De	Fall Semester	Intermediate Ceramic Sculpture(2)	3	Ceramic Sculpture will cover a range of concepts, traditions and techniques that are specific to the disciplines of both ceramics and sculpture. Projects will revolve around the topics of texture, structure and form and the development of ideas.
Undergraduate	of Chemical and Biomolecular	Fall Semester	Electrochemical engineering	3	In this class, we will learn various electrochemical reactions in natural or artificial systems, thereby establishing fundamental basis between electrical and chemical events. In the later part of the class, we will discuss various types of electrochemical cells and their operation mechanisms.

Undergraduate	Department of Civil Engineering	Spring semester	Structural Analysis	3	In the structural analysis, students will learn how to calculate reaction forces, member forces, and displacements of structures under external loads. Those calculated from the structural analysis will be used in the section design of RC or steel structural members.
Undergraduate	Department of Civil Engineering	Fall Semester	Construction Materials Lab (1)	3	This course introduces students to the basic materials used in construction including cement, aggregates, concrete, asphalt and metals. The course includes learning basic theories and properties during regular classes and experiments in the lab.
Undergraduate	Department of Civil Engineering	Spring semester	River Engineering and Hydrology	3	The field of hydrology is of fundamental importance to civil and environmental engineers because of the environmental significance of water supply, major floods and droughts and their management, drainage and urban stormwater issues, floodplain management, and water quality impacts. In recent years, hurricanes and storm surge have contributed significantly to urban disasters, especially along coastal areas where urban development has expanded rapidly.
Undergraduate	Department of Civil Engineering	Spring semester	Soil Mechanics I	3	This lecture provides an elementary introduction to Geotechnical Engineering, and provides the fundamental mechanics necessary for the detailed study of Geotechnical Engineering.
Undergraduate	Department of Civil Engineering	Spring semester	Hydraulic and Lab	3	This course reviews all hydraulic subjects including continuity, Bernoulli, Momentum equations for further understanding of viscous pipe flows, open channel hydraulics and some hydraulic structures. Student enhances the fundamental understandings of hydraulics through the study of dimensional analysis and empirical equations with some hydraulic applications and experiments.
Undergraduate	Department of Civil Engineering	Fall Semester	Water Resource Engineering	3	The field of hydrology is of fundamental importance to civil and environmental engineers because of the environmental significance of water supply, major floods and droughts and their management, drainage and urban stormwater issues, floodplain management, and water quality impacts. In recent years, hurricanes and storm surge have contributed significantly to urban disasters, especially along coastal areas where urban development has expanded rapidly.
Undergraduate	Department of Civil Engineering	Fall Semester	Soil Mechanics II	3	This lecture is an extension of the Soil Mechanics in the first semester. It provides the study of compressibility, shear strength of soil, lateral earth pressure, slope stability, and soil bearing capacity. Based on these studies design of retaining walls, foundation, and slope stability will be demonstrated by students.
Undergraduate	Department of Civil Engineering	Fall Semester	Hydraulics	3	This course reviews, at a beginning stage, continuity and Bernoulli equations for further understanding of viscous pipe flows and open channel hydraulics. Student enhances the fundamental understandings of hydraulics through the study of dimensional analysis, and empirical equations (Darcy-Weisbach/Moody diagram/Colebrook-White).
Undergraduate	ent of Computer Science and En	Fall Semester	Smart App Programming	3	This module is designed to develop Apple iOS applications. Through this course, students will create a number of small applications, each designed to highlight specific iOS features and to show you how to control or interact with those features.

Undergraduate	ent of Computer Science and En	Fall Semester	Mobile Programming	3	Understand mobile programs that apply to the latest mobile phones and learn how to build mobile programs that can be run in real time. In this course study the characteristics of mobile programming environment such as low memory, low CPU performance, mobile-specific API, and learn mobile programming skills right away.
Undergraduate	ent of Computer Science and En	Spring semester	Introduction to Programming(1)	3	This course serves as an introduction to programming and provides basic understanding of the C programming language. In particular, the course focuses on providing a good base for coming course and in this course, students learn how to describe and implement their programmed solutions to simple and moderately challenging problems using the procedural programming paradigm.
Undergraduate	ent of Computer Science and En	Fall Semester	Introduction to Programming(2)	3	This course primarily gives an introduction to the programming language C++ and covers the elements of object-oriented programming. For this purpose, the early classes cover the aspects of C++ that are common to most high-level programming languages. Then, this course provides the students with an overview and training in C++ using the object-oriented programming features such as encapsulation, inheritance, and polymorphism.
Undergraduate	ent of Computer Science and En	Fall Semester	Multimedia Systems	3	This course consists of the following 2 parts: (1) Multimedia information processing - Data compression techniques, JPEG image compression technique, MPEG video compression technique (2) Multimedia information retrieval - High-dimensional multimedia data indexing techniques, High-dimensional multimedia data searching techniques, High-dimensional multimedia data ranking techniques
Undergraduate	ent of Computer Science and En	Spring semester	Object Oriented Programming Language	3	This course is to provide students with the knowledge and skills necessary for object oriented programming of Java applications. They learn Java programming language syntax and object-oriented concepts, as well as more sophisticated features of Java runtime environment, such as support for GUI, multithreading, and networking
Undergraduate	ent of Computer Science and En	Spring semester	Unix System	3	UNIX is an operating system that is a stable, multi-user, multi-tasking system for servers, desktops and laptops. Topics include basic elements of the UNIX operating system, UNIX commands and utilities, hierarchical file structure, creating and editing documents and shell programming. Advanced tasks of user management, file system backup and restore, boot management, network setup and configurations are also included.
Undergraduate	ent of Computer Science and En	Fall Semester	Engineering Mathematics	3	This subject provides the student with the fundamental knowledge of mathematics to solve computer science and engineering problems. Linear algebra, Vector calculus, Fourier analysis and partial differential equations, Complex and complex functions, Power series, Complex analysis, Numerical solution of linear algebra and differential equations. It also cultivates the ability to analyze engineering phenomena.
Undergraduate	Department of Design	Spring semester	Basic UX	3	This lecture aims to create and develop a way for users to interact with things or services. Students will develop their interaction and interface design skills based on user-centered design principles.
Undergraduate	Department of Design	Spring semester	ID(3)	3	This course aims to develop students' problem-solving and form-creating ability at a more advanced level by conducting a product design project. In the project, students will address more complicated product functions and structure, based on design knowlegde and skills cultivated through ID(1) and ID(2).

Undergraduate	Department of Design	Fall Semester	Design Theory	3	In this introductory course to the major, students learn the academic meaning and major theories of design and understand the social and cultural context of design.
Undergraduate	Department of Design	Spring semester	Design Research	3	This course aims to introduce the basic principles of design research and its applicable methods for design practice. Design process, design methodology, and qualitative research methods will be emphasized in depth.
Undergraduate	Department of Design	Fall Semester	Graphic Design	3	Explore the design elements of modern society and analyze the use of visual communication. Study and analyze the basic elements of graphic design to understand the basic principles of design that are being applied to the different media. Learn the basic principles of design to harden the basic concepts and expressions of visual design. to establish creativity and basic visual presentation skills in the basic areas of visual design with a variety of creative training.
Undergraduate	Department of Design	Spring semester	ID(1)	3	This course aims to develop students' ability to demonstrate the process of design that related to industrial design practice through developing a simple product from idea generation to a specific tangible form.
Undergraduate	Department of Design	Fall Semester	Design Management	3	Analyze trends throughout the design and apply new concepts and plans to design using different design ideas and methods of developing ideas. Begin with a combination of emotional and creative approach to thinking and run the entire branding process, from planning to design performance.
Undergraduate	Department of Design	Fall Semester	Service Design	3	This course aims to study service design through analyzing and gaining knowledge in service design process, methodology and examples.
Undergraduate	Department of Design	Fall Semester	Drawing&Coloring	3	Drawing is the basic method of expressing their thoughts and emotions. It has been developed by many artists as a language of showing their concepts for the long time. Now they have became the important genre of the plastic arts, not just as a sketchs made before painting or other classical artworks. Color is one of the main factor of drawing and understanding of chromatics & various color theory helps to improve one's ability of expression. We aims at understanding of the various meanings of color and its role of the contemporary artworld and design. Also we expect students can use various colors in their drawings as a form of showing their thinking and feelings.
Undergraduate	ent of Electronic and IT Media Er	Spring semester	Electronic Principles(Ⅰ)	3	This course is intended to introduce students to electronics circuits that can be used for IC including semiconductor, PN junction, Diode, MOSFET, and single stage amplifier. For dealing the theme of this course, it is noticed that this course is for the students who completed the course of Electrical circuit Engineering
Undergraduate	ent of Electronic and IT Media Er	Fall Semester	Electronic Principles(Ⅱ)	3	This course is intended to introduce students to electronics circuits that can be used for IC (= Integrated Circuit) including differential Amplifier, Mutilstage amplifier, Frequency Response, Feedback, Output stage and Power amplifier. For dealing the theme of this course, it is noticed that this course is for the students who completed the course of Electrical circuit Engineering and Electronics Circuit Engineering (I).
Undergraduate	ent of Electronic and IT Media Er	Spring semester	Operating System	3	This course aims to understand design and implementation of operating system components such as process management, CPU scheduling, memory management, file system, and so on. For the purpose, operating system code as well as basic concepts are lectured.

Undergraduate	nt of Electronic and IT Media Er	Fall Semester	Digital Integrated Circuits	3	Digital Integrated Circuits is an essential course for engineers in the areas of integrated circuit design and digital design. In this course, students study transistor-level design of digital logics and design considerations for digital integrated circuits.
Undergraduate	nt of Electronic and IT Media Er	Spring semester	Engineering Mathematics(1)	3	This course is intended to introduce students to applied mathematics that ar most relevant for solving engineering problems. In the first part of year-long course, we wiil cover the following subjects: Ordinary differential Equations, Laplace Transforms, and Linear Algebra
Undergraduate	nt of Electronic and IT Media Er	Fall Semester	Engineering Mathematics(2)	3	This course is intended to introduce students to applied mathematics that ar most relevant for solving engineering problems. In the first part of year-long course, we wiil cover the following subjects: Expectation, and Random Processes
Undergraduate	nt of Electronic and IT Media Er	Spring semester	Electromagnetics(1)	3	This course covers from vector calculus to theories and basic phenomena on electrostatics in electromagnetics
Undergraduate	nt of Electronic and IT Media Er	Spring semester	Electronic Circuit Theory(1)	3	Circuit Theory (1) is the fundamental course in electrical engineering. In this course, students study DC analysis and transient analysis in order to understand and analyze various circuits that are composed of resistors, capacitors in the time domain.
Undergraduate	nt of Electronic and IT Media Er	Fall Semester	Electronic Circuit Theory(2)	3	Circuit Theory (2) is the fundamental course in electrical engineering. In this course, students study various circuits that are composed of resistors, capacitors, and inductors. Based on the fundamental circuit theories, students also study how to analyze circuits and networks in the frequency domain as well as the time domain.
Undergraduate	nt of Electronic and IT Media Er	Fall Semester	Electromagnetics(2)	3	This course covers from vector calculus to theories and basic phenomena on electrostatics in electromagnetics
Undergraduate	nt of Electronic and IT Media Er	Spring semester	Semiconductor Engineering	3	he first half of this course covers basic properties of semiconductors including metal oxide and organic semiconductors for the next generation electric devices such as a flexible display. The second half covers physical principles and operational characteristics of a PN junction.
Undergraduate	nt of Electronic and IT Media Er	Spring semester	Broadcasting Communication Theory	3	This course will teach the basic knowledge of variety of broadcasting and communications. As theoretical lectures; Basic skills demodulation and multiplexing technology, digital communication and broadcast technologies for content As for contents analysis and processing of broadcasting and communication signals. As for key point are enhance the understanding of learning, and leads to combine the practical basis of skills using by MATLAB
Undergraduate	nt of Electronic and IT Media Er	Fall Semester	Advanced Semiconductor Devices	3	Learn fundamentals of Field-Effect Transistor and its variations such as thin-film transistor, nano-scale transistor, and FinFET. Review the fundamentals of PN junction and expand them to Bipolar Junction Transistor, solar cell, and Light Emitting Diode.
Undergraduate	nt of Electronic and IT Media Er	Spring semester	Wireless Communication System	3	This course deal with various basic concepts and overview of wireless communication system and its application including hot issues, new technologies and etc. Also, Principle, service and future technology direction according to wireless communication technology development could be learned.

Undergraduate	nt of Electronic and IT Media En	Spring semester	Digital Image Processing	3	In the process of acquiring a digital image, the quality of an image according to the number of resolution quantization bits, image processing through a pixel unit, image processing through a filter, noise removal, feature extraction, image conversion technique, Geometric transformation, modeling and restoring of corrupted causes, image compression, and image segmentation. This course will enable students to apply the acquired image processing theory to multimedia communication, smart media, HDTV, UHDTV, robot vision, pattern recognition, artificial intelligence, media art and video security technology.
Undergraduate	nt of Electronic and IT Media En	Spring semester	Digital Signal Processing and Application	3	Processing of digital signals in the time and frequency domain, including digital signal processing, digital signal representation, digital signal filtering, discrete-time Fourier transform, discrete Fourier transform, and fast Fourier transform And experience filter design through MATLAB.
Undergraduate	nt of Electronic and IT Media En	Fall Semester	Signal and Systems Engineering	3	In order to understand the system of broadcasting and communication field, it is necessary to understand the signal and the system in the time axis and the frequency axis. In this course, we study mathematical background knowledge such as Fourier transform, Fourier series, You will learn how to apply it to signals that are mainly used in relation to communication transmission, and how to analyze the input and output signals of the system on the time axis and frequency axis respectively.
Undergraduate	nt of Electronic and IT Media En	Fall Semester	Experiment of IT Fundamental simulation	3	Learn foundation learning ability to performed basic concept design and basic simulation.
Undergraduate	nt of Electronic and IT Media En	Fall Semester	IoT Convergence Technology	3	This course opened for students who accumulated IT – related knowledge. It would handing latest IT convergence Technologies which actively going on commercialization. The course content start from basic technology for a wired or wireless IT convergence Technology and lecture to latest a wireless IT convergence element technology in IEEE 802. Also, this course is dealing with oral presentation, it could be enhance understanding of learning and practical skills.
Undergraduate	nt of Electronic and IT Media En	Fall Semester	Immersive Media Engineering	3	Prepare for realistic media and futuristic media technology through the theory and practice of digital TV principles, realistic elements in UHDTV, 3DTV, free-view video, VR, AR / MR etc. Key Prerequisite: Programming Language , Digital signal processing, video signal processing, etc.
Undergraduate	t of Electronical and Information	Fall Semester	Software Application	3	This class emphasizes using object oriented analysis and design techniques to learn the C++programming language. Students completing the course will learn C++ syntax, how to make use of theC++ standard library, and how to design and implement overloading, class, templet, etc.
Undergraduate	t of Electronical and Information	Fall Semester	Signals and Systems	3	This classs is for understanding and analysis of signals and systems in the area of electrical and electronics engineering. Basic theories are discussed for concepts of discrete and continuous signals and systems, mathematical respresentation of the signal, linear systems, convolution theory, Fourier series and transform.
Undergraduate	t of Electronical and Information	Spring semester	Communication Engineering	3	Theory of the core blocks of the analog communication system is discussed based on the mathematical analysis of the system. Review of the Fourier analysis and linear system is followed by amplitude modulation, frequency modulation and pulse modulation method. Design project is carried out which can help the students to develop the ability to utilize the software tool such as Matlab to solve the practical problems in communication theory.

Undergraduate	of Electronical and Information	Fall Semester	Digital Communication	3	Basic theory of digital communication systems is disscussed which includes operation of core blocks of systems, baseband transmission, digital modulation/demodulation, random signals analysis and matched filter theory.
Undergraduate	of Electronical and Information	Spring semester	Digital Signal Processing	3	This course covers main concepts of digital signals and systems which include difference equation, stability of system, z-transform, transfer function, FFT, digital filter design and time-frequency analysis.
Undergraduate	of Electronical and Information	Fall Semester	New and Renewable Energy	3	The subject covers basic principles of renewable energy generation, system configuration, design process of each part, grid connection technology, electrical quality, etc., especially for wind power generation, solar photovoltaic. This course deals with the analysis, design and operation characteristics of power generation system in depth.
Undergraduate	ment of English Language and Lit	Fall Semester	English in Media	3	This course is designed to help students improve their Media English listening comprehension ability, small group discussion and class presentation ability. The course will mostly offer various English news materials which will provide students with an opportunity to understand authentic Media English, and review and practice vocabulary and phrases frequently used in Media English. Class will be conducted in English and students are encouraged to actively participate and communicate in class.
Undergraduate	ment of English Language and Lit	Fall Semester	English and Current Events	3	This course is designed to provide information and knowledge on international politics and economics with special emphasis on English communication and multi-cultural knowledge. Students are expected to actively participate in English learning activities in order to enhance awarenwss in international politics and communication skills. These skills and knowkede are believed to help students pursue international careers in the near future.
Undergraduate	ment of English Language and Lit	Spring semester	English Grammar	3	This course is designed to provide students with comprehensive knowledge of English grammar. The course will discuss the basic concepts and major topics in English grammar, mostly in terms of traditional grammar. It will start with parts of speech and move to simple and complex sentence constructions.
Undergraduate	ment of English Language and Lit	Spring semester	Introduction to English Linguistics	3	This course is an introduction to English Linguistics. It will provide students with the basic concepts of English linguistics, including English phonetics, phonology, morphology, and syntax.
Undergraduate	ment of English Language and Lit	Fall Semester	English Phonetics and Phonology	3	This course is an introduction to English phonetics and phonology, the study of English sounds and their patterns. It is designed to provide students with the basic concepts and major topics of English phonetics and phonology, including English consonants, vowels, phonemes, syllables, stress, intonation, etc.

Undergraduate	ment of English Language and Lit	Spring semester	Movies and English	3	The purpose of this course is to explore possible ways of enhancing students'overall English proficiency through American movies. Educational emphasis will be on development of oral language skills, but reading and written aspects of English will be studied,too. Any students with active motivation to promote their English language skills are encouraged to take this course.
Undergraduate	ment of English Language and Lit	Spring semester	Teaching Method of English	3	The purpose of the course is to develop the basic knowledge of the current teaching methods in L2. Students will be able to appy their knowledge of teaching methods to practice through teaching presentation in groups. Students should be required to read the main textbooks and take active part in the classroom activities.
Undergraduate	ment of English Language and Lit	Fall Semester	English Education	3	The purpose of the course is to inform students of the basic theories of second language acquisition. So, the course covers first language acquisition, the individual differences associated with second language acquisition, classroom learning and othre variables related to the second language acquisition. Students should be required to read the main textbooks and take active part in the classroom activities.
Undergraduate	ment of English Language and Lit	Fall Semester	TEFL	3	The purpose of the course is to teach methodology related to speaking, listening, reading, and writing skills. In addition, the course covers how to design lesson plan, proficiency, form-focused instruction, and assessment. From this course, students are required to present one of the main topics covered in the course. They also should read the main textbooks and take active part in the classroom activities.
Undergraduate	ment of English Language and Lit	Spring semester	Pragmatics in English Education	3	This course is to aim to develop students'' pragmatic knowledge in learning English. Students should be famailiar with the basic theories of semantics and pragmatics and its related English expressions. Students understand basic theories of semantics and prgmatics. They are invited to open discussion about the theories in class. In addition, students will present the real expressions associated with the theories in English.
Undergraduate	ment of English Language and Lit	Fall Semester	Advanced English Presentation	3	This course will train students so that they can make effective English presentations with confidence. Students will learn how to prepare and organize presenting materials, and deliver the presentation like professionals. This course is conducted in English only. Students are required to make presentations several times and grading emphaisis will be on presentation skills as well as on English competence.

Undergraduate	ment of English Language and Lit	Fall Semester	English in Media	3	This course is designed to help students improve their Media English listening comprehension ability, small group discussion and class presentation ability. The course will mostly offer various English news materials which will provide students with an opportunity to understand authentic Media English, and review and practice vocabulary and phrases frequently used in Media English. Class will be conducted in English and students are encouraged to actively participate and communicate in class.
Undergraduate	ment of English Language and Lit	Spring semester	English Grammar	3	This course is designed to provide students with comprehensive knowledge of English grammar. The course will discuss the basic concepts and major topics in English grammar, mostly in terms of traditional grammar. It will start with parts of speech and move to simple and complex sentence constructions.
Undergraduate	ment of English Language and Lit	Spring semester	Introduction to English Linguistics	3	This course is an introduction to English Linguistics. It will provide students with the basic concepts of English linguistics, including English phonetics, phonology, morphology, and syntax.
Undergraduate	ment of English Language and Lit	Fall Semester	English Phonetics and Phonology	3	This course is an introduction to English phonetics and phonology, the study of English sounds and their patterns. It is designed to provide students with the basic concepts and major topics of English phonetics and phonology, including English consonants, vowels, phonemes, syllables, stress, intonation, etc.
Undergraduate	ment of English Language and Lit	Fall Semester	English Education	3	The purpose of the course is to inform students of the basic theories of second language acquisition. So, the course covers first language acquisition, the individual differences associated with second language acquisition, classroom learning and othre variables related to the second language acquisition. Students should be required to read the main textbooks and take active part in the classroom activities.
Undergraduate	ment of English Language and Lit	Fall Semester	TEFL	3	The purpose of the course is to teach methodology related to speaking, listening, reading, and writing skills. In addition, the course covers how to design lesson plan, proficiency, form-focused instruction, and assessment. From this course, students are required to present one of the main topics covered in the course. They also should read the main textbooks and take active part in the classroom activities.
Undergraduate	ment of English Language and Lit	Spring semester	Pragmatics in English Education	3	This course is to aim to develop students'' pragmatic knowledge in learning English. Students should be famailiar with the basic theories of semantics and pragmatics and its related English expressions. Students understand basic theories of semantics and prgmatics. They are invited to open discussion about the theories in class. In addition, students will present the real expressions associated with the theories in English.
Undergraduate	rtment of Environmental Engine	Fall Semester	Water quality management	3	This module is designed to study water on earth, the most fundamental of environmental ecosystem. This module provides students with the understanding of water pollution source, calculation of water pollution load, physical, chemical and biological degradation.

Undergraduate	rtment of Environmental Engine	Fall Semester	ding and planning of water and wastewat	3	This course provides comprehensive coverage of the fundamental principles and current practics in water processing, water distribution, wastewater collection, wastewater treatment, sludge processing, advanced wastewater treatment, and water reuse. Students will learn the basic of water and wastewater engineering as well as design skills.
Undergraduate	rtment of Environmental Engine	Spring semester	Water treatment engineering	3	It covers wide area on water treatment engineering focused on the treatment principle and process. With this background information and knowledge, students are going to learn how to design unit-processes for water treatment by practical design examples. Nonconventional treatment processes to remove specific constituents that conventional treatment leaves behind will be also introduced.
Undergraduate	rtment of Environmental Engine	Fall Semester	Wastewater treatment engineering	3	• Understanding of wastewater sources and characteristics • Understanding of wastewater treatment process • Development of ability to select proper treatment process specific for wastewater characteristics • Fundamentals and applications of physical, chemical and biological treatment
Undergraduate	Department of Fine Arts	Spring semester	Studio(7)	3	learn how to make expression with digital medium. Study various methods to create digital Art
Undergraduate	Department of Fine Arts	Fall Semester	Studio(8)	3	To prepare for the graduation exhibition. Study the process and completion of digital expression, and concerning various factors of exhibition installation
Undergraduate	ment of Food Science and Tech	Fall Semester	Food Safety and Law	3	Topics concerning various food-borne illness, natural food poisoning, environmental food contaminants and a review of food laws and regulations
Undergraduate	nt of Mechanical & Automotive E	Spring semester	Mechanics of Materials	3	This course introduces the concept of stress and strain, normal and shear stresses, and the transformation of stresses. Students learn how to calculate the reaction forces and stresses for torsional bars and deflected beams using free body diagrams. In addition, students also learn about Mohr's circle, applications of plane stress, deflections of beams and buckling in columns.
Undergraduate	nt of Mechanical & Automotive E	Fall Semester	Statics	3	This course introduces the fundamental concepts and methods of statics in engineering mechanics. A number of subjects are taught including elementary vector analysis, resultants of force systems, free body diagrams, equilibrium of rigid bodies, center of mass, moments of inertia, friction, internal forces and moments, and structural analysis of cable, frame, and truss structures.
Undergraduate	nt of Mechanical & Automotive E	Spring semester	Engineering Mathematics(1)	3	This course covers the core topics of engineering mathematics, an important tool for analyzing the system behavior through mathematical modeling of real engineering systems that are essential for mechanical and automotive engineering. For this purpose, this cource mainly deals with differential equations (linear differential equations) and Laplace transform among various fields of engineering mathematics.
Undergraduate	nt of Mechanical & Automotive E	Spring semester	asic Electrical & Electronical Engineerin	3	This course is designed to provide students with basic information on electrical and electronic engineering needed for mechanical and automotive engineers. The course covers the basic concepts and applications of electrical and electronic engineering, and the configurations, operation principles and basic circuits of electrical and electronic equipment.

Undergraduate	nt of Mechanical & Automotive E	Fall Semester	Fluid Mechanics	3	The major focus of this course is on the understanding of the thermal and fluid flow energy existing in nature. With concrete understanding of the basic theories of fluid statics and dynamics, the students will be prepared to apply their knowledge to estimate and evaluate the energy levels existing in nature. The students have already been introduced to the subjects related to Thermodynamics in 1st semester of 2nd year. The course consists of 4 parts, Introduction and terminology, Theory of fluid mechanics, Application of the theory (internal flow) and Introduction to measuring of the fluid properties. The detail of the course work covered by this course is given below. In this course we are going to focus more on internal flows. If you are interested in external compressible flows for the application to vehicle design, then Automotive Aerodynamics (127367) in 4-year is the course you should be considering. 1. Introduction to Fundamental Concept, Terminology and Units/Dimensions 2. Theory of Fluid Statics (Relationship between Pressure difference(ΔP) and Height(Δh)) 3. Theory of Fluid Dynamics (Conservation Law of Mass, Momentum and Energy, Navier-Stokes Equation) 4. Analytical Approach to Fluid Flow (Dimensional Analysis/Similarity) 5. Application to Internal Flow Problems 6. Introduction to Experimental Approach of Fluid Mechanics (Measurement of Viscosity, pressure, velocity and flow rate of flow)
Undergraduate	nt of Mechanical & Automotive E	Fall Semester	Dynamics	3	This course introduces engineering students to dynamics of particles and rigid bodies. Methods (kinematic relationships, Newton''''s laws, conservation of energy, momentum, and angular momentum) for analyzing the motion of particles and bodies are learned.
Undergraduate	nt of Mechanical & Automotive E	Fall Semester	Manufacturing Processes	3	This course introduces basic concepts of casting, plastic work and welding. The general knowledge on measuring technique, turning of universal machine tools, and machining theory will be also covered.
Undergraduate	nt of Mechanical & Automotive E	Spring semester	Internal Combustion Engine	3	In this introductory course of the power system of an automobile, the major focus is on the design theory of an IC (Internal Combustion) engine to have you understand the operating principle of IC engines, the thermo-chemistry of the combustion phenomena of the mixed gas in cylinder, the performance analysis of the gasoline and diesel engine with some assumptions to make the theory simple through the engine cycle analysis. For an easy approach to the ideal cycle simulation of an engine, some assumptions are given to the air flow such as steady, incompressible, inviscid and continuum flow. At the later part of this lecture, the principle of the formation of the harmful emissions from combustion and their treatment method will be introduced because the emissions from the ground transportation vehicle are not only the problem for the human-being but for the nature disaster. Therefore it is important to have a sound concept of the formation of the harmful emission from the combustion of the IC engines to have the key solution of the emission problem of automobile.
Undergraduate	nt of Mechanical & Automotive E	Fall Semester	ntroduction to Micro and Nano Technolog	3	Miniaturization technologies now have important roles in the fields of electronics, materials, and biomedical engineering. The goal of this course is to learn state-of-the-art techniques in fabricating micro and nanoscale devices, selected device applications, and the design tradeoffs in developing systems.

Undergraduate	t of Mechanical & Automotive E	Spring semester	Measurement Engineering	3	Student studies the basic concepts related to various measurement and the components of measurement system required for development and testing of various mechanical structures including vehicles. In addition, by learning LabView, which is a measurement and control commercial program, students can access to various analog measuring instruments. Students also study various signal-processing methods to understand the characteristics of measured signals. Finally, students will learn how to design and use PC-based Virtual Instrument (VI), which is widely used in recent industrial fields.
Undergraduate	t of Mechanical & Automotive E	Spring semester	Computational Fluid Dynamics	3	CFD is a branch of fluid mechanics and is the numerical approach scheme for the thermal & fluid flow analysis in the flow field. This course is prepared for Year-3 and Year-4 students of mechanical and automotive engineering to advance their engineering ability for the research and development of the engineering problems in industry. This study plan should prepare students to be able to understand thermal and fluid flow phenomena in nature for the application of the thermal and fluid flow energy in our daily life. Aims of this major subject are on the development in students a knowledge and appreciation of the thermal and fluid engineering for the designing of the energy converting systems; wind turbine, hydro turbine, fans etc. To encourage hands-on experimentation with the measurement of basic properties of fluid, three experiments are prepared in this course work.
Undergraduate	t of Mechanical System Design	Fall Semester	Statics	3	Statics is the first course to present the effect of forces on materials. Students will learn how to systematically calculate the status of the materials using free body diagram
Undergraduate	t of Mechanical System Design	Fall Semester	Manufacturing Processes	3	Manufacturing is the process of making raw materials into the desired form using tools. During processing, materials undergo extreme deformation or phase change and a wide range of basic scientific and engineering knowledge, including materials, physics, chemistry, mechanics and electricity, is required to understand them. This course aims to introduce various manufacturing processes for industrial materials and to understand the fundamental principles related to them. It also provides a basic knowledge of the tools, materials and processing conditions required in each process and focuses on making students understand the importance of these processes in manufactuing products.
Undergraduate	t of Mechanical System Design	Fall Semester	Numerical Analysis	3	This unit is concerned elementary numerical analysis to solve engineering problems. Topics covered in this class are: solving nonlinear equations, solving sets of equations, interpolation, numerical differentiation and integration. It gives basic concepts of numerical method to solving equations. To help the solving problems MATLAB will be used in the assigned project.
Undergraduate	t of Mechanical System Design	Fall Semester	CAD(Computer Aided Design)	3	CAD, or computer-aided design, is a powerful modeling tool that technical professionals use. With CAD, engineers can draw plans of components and products, and can develop the plans. Using CAD, engineers can model 3D parts and then fit them together in an "assembly" view so that they can see beforehand how their products will look. With the 3D model, professionals can also create precise engineering drawings in 2D, complete with dimensions and specifications, in a neat and readable format. This modeling method has taken design to a whole new level of efficiency and accuracy. This course will introduce you to the process of modeling 3D objects with computer-aided design.

Undergraduate	of Mechanical System Design	Spring semester	Control	3	This module covers analysis and design of mechanical control systems. Basic control methods in this module are mainly based on classical control methods. Main subjects are (1) block diagram modeling of components and systems, (2) time domain, s-domain and frequency domain analysis, (3) control algorithms, (4) root locus method and frequency domain compensator design. As a tool, MATLAB is used for analysis and design of control systems. In the final stage, experiment of DC motor position/velocity control by PID algorithm will be performed.
Undergraduate	of Mechanical System Design	Spring semester	Metal forming and Plasticity	3	This course covers stress-strain relationship, yield condition, plastic deformation of materials and metal forming processes. Students will learn the types and characteristics of various plastic processing such as sheet metal forming, forging, extrusion, and drawing.
Undergraduate	of Mechanical System Design	Fall Semester	Robotics	3	Through this course, basics on coordinates, transformation, robot forward/inverse kinematics analysis, D-H notations, and trajectory planning with an understanding of robot motion analysis are privided and control applications. Also actuators and sensors adopted to robot system are introduced to understand the principles and to apply those scemes to robot system design. Robot vision technique is provided to adopt more intelligent behaviors for robots.
Undergraduate	of Mechanical System Design	Spring semester	Sensor and Measurement	3	In order to monitor and control the condition of a material, machine, or process, a measurement system to transduce the condition into measurable signals is needed. In this context, this course focuses on understanding the basic principles of various sensors and measurement as well as the main components of measurement systems. Furthermore, this course seeks to cultivate the ability to apply them to engineering problems through the lab sessions in which the students implement varius measurement systems using the DAQ system and Labview programming.
Undergraduate	epartment of Metal Arts & Desig	Spring semester	Craft Desigh Management(1)	3	This course will enable students to make assessments of strategic design management; it is not intended to teach specific design which are currently regarded as strategic, but rather to train the individual to identify opportunities for application of metal craft, to quantify return value and success, and to manage the people and processes associated with the identification and application of metal craft.
Undergraduate	epartment of Metal Arts & Desig	Fall Semester	Craft Desigh Management(2)	3	This course will enable students to make assessments of strategic design management; it is not intended to teach specific design which are currently regarded as strategic, but rather to train the individual to identify opportunities for application of metal craft, to quantify return value and success, and to manage the people and processes associated with the identification and application of metal craft.
Undergraduate	Department of Optometry	Spring semester	Optometric Materials science(1)	3	Introduction of Material Science will be carried out in this course including is an introduction to three topics fundamental to materials science and engineering: structure, bonding, and thermodynamics. Bonding dictates structure, and structure in turn provides constraints on the thermodynamic properties of materials. Students will learn and achieve full understanding of Materials Science involving Physics, Chemistry, Mechanical and Optical Engineering.
Undergraduate	Department of Optometry	Fall Semester	Optometric Materials science(2)	3	Introduction of Material Science will be carried out in this course including is an introduction to three topics fundamental to materials science and engineering: structure, bonding, and thermodynamics. Bonding dictates structure, and structure in turn provides constraints on the thermodynamic properties of materials. Students will learn and achieve full understanding of Materials Science involving Physics, Chemistry, Mechanical and Optical Engineering.

Undergraduate	Department of Optometry	Spring semester	Modern Optics	2	Based on the fundamental concepts of geometrical & wave optics, students are learning in more detail about wave optics including interference, diffraction, polarization, optical spectra and lasers. While describing such optical properties, some mathematical techniques will also be handled. Through this course, students will be ready to understand many optical devices associated with our daily lives better.
Undergraduate	epartment of Public Administrati	Fall Semester	An Introduction to Law	3	This class is to answer the basic contents, what is law and its meaning, if you ask. In this class we try to learn what is the
Undergraduate	epartment of Public Administrati	Fall Semester	Introduction to Public Management	3	This course focuses on developing each students comprehension of the history and foundational underpinnings of Public Management. The course will cover the economic, political, and social dynamics within the field of public administration; essential organizational, decision making, and leadership theories; and the management challenges related to intergovernmental relations, human resources management, diversity management, performance management, and technology. Through the use of the textbook, assigned readings, and case studies, students will be afforded an opportunity to advance their theoretical and practical knowledge of public management.
Undergraduate	epartment of Public Administrati	Spring semester	Public Administration	3	There will be opportunities for in-class exercises and group assignments of actual data analysis. (This is a tentative syllabus). E-class will be the primary means through which class announcements and assignments will be distributed.
Undergraduate	epartment of Public Administrati	Fall Semester	Introduction to the study of laws	3	This class is to answer the basic contents, what is law and its meaning, if you ask. In this class we try to learn what is the
Undergraduate	Department Of Safe Engineering	Fall Semester	Applied Ergonomics	3	Improvements to safety design, complex or error-prone workplaces that take into account the position of users and workers, and user-friendly design issues that reduce most of the worker's musculoskeletal disorders(MSD) human errors that can occur once in a lifetime. In addition, we learn how to create safety culture, which is a big business concern for today, starting with DuPont company case.
Undergraduate	Department of Sports Science	Spring semester	Psychology of sports	3	Through this class, the students can understand the effects of sychological factors on physical and motor performance and the effects of participation in physical activity on psychological development, health and well-being
Undergraduate	Department of Sports Science	Spring semester	Tennis(Ⅱ) (Intermediate Tennis)	2	This class is designed for the Intermediate tennis player. Students will be taught the basic and advanced tennis strokes and some tennis strategies to reach a proficiency level that will enable them to play recreationally. Physical activity will be a major emphasis of the course, and students will be expected to participate in moderate to vigorous activity when they are in class.
Undergraduate	Department of Sports Science	Fall Semester	Tennis I (BEGINNING TENNIS)	2	This course is designed to teach the basics of tennis, including forehand, backhand, serves, singles, and doubles strategy.
Undergraduate	Department of Sports Science	Spring semester	Health and Exercise Psychology	3	This course will examine applied and theoretical issues related to the psychology of physical activity. Theories of exercise behavior will be examined in relation to the increasing problems of exercise adherence and physical inactivity. Other topics that will be discussed include; the psychological benefits and barriers of participating in physical activity. Various intervention strategies will be discussed to change physical inactivity habit and how to deal with special populations.

Undergraduate	Department of Sports Science	Spring semester	Sport Marketing	3	The application of marketing principles and activities such as —marketing research, segmentation, product development, pricing, event marketing, sponsorship, consumer behavior, branding, advertising, and sales promotion will be analyzed and discussed in the context of sports. Students will be required to demonstrate knowledge of marketing principles and to identify the effective use of marketing mix.
Undergraduate	Department of Sports Science	Fall Semester	Aerobics	2	The primary purpose of the aerobics is to enhance cardio function. Advantages of aerobics are fun, easy, and motivate to continue participating in workout. This course is based on a theory of basic exercise physiology such as aerobic or anaerobic energy metabolism. The students will understand the theory of aerobics and basic aerobic movements and the structure of aerobics class. In addition, all students will learn how to teach aerobics class and will be trained as an aerobics instructor. To take this course, Introduction to Functional Anatomy is prerequisite.
Undergraduate	Department of Sports Science	Spring semester	sports taping techniques &special tests	3	Students will learn the theoretical background about basic special tests for joints and muscles where sports injuries are expected. In order to understand for the special tests, students will have a chance to practice of the special tests. In addition, students will learn basic taping effect for joint fixation and muscle strengthening that is required in sport injury prevention and re-injury prevention and sports rehabilitation process. Then, students will perform the taping method that appropriates to the injury situation of the athletes. In this process, individuals will be able to select what the best taping technique is for. Prerequisite for the Introduction to Functional Anatomy is required.
Undergraduate	Department of Sports Science	Fall Semester	Advanced Human Anatomy	3	This course is advanced human anatomy. Understand about the peripheral nerves and the arteries of human. Also, the class will focus on sports related signs & symptoms of acute and chronic nerve and artery injuries. The prerequisite subject for this class is Introduction to Functional Anatomy.
Undergraduate	Department of Sports Science	Spring semester	Introduction to functional anatomy	3	This course focus on the human body functions related with the skeletal system which is bone, joint, and muscle. Especially, the course will cover a basic anatomy in a sports setting which relates sports injury and sports rehabilitation.
Undergraduate	Department of Sports Science	Fall Semester	Personnel Mamagement in Sport	3	This course is designed to provide an overview of the management structure, process, and responsibilities in sport service organizations. A study of administrative theory and principles will be applied to solve organizational problems as they relate to the process of planning, organizing, staffing, leading, and other issues that are related to operating physical activities and sport programs. Organizational behavior, leadership, and strategic management in sport receive special attention.
Undergraduate	Global Technology Management	Spring semester	Management and Entrepreneurship	3	This course provides basic understanding of management and entrepreneurship. Topics such as changing business environment, business ownership, managing organizations, marketing management, technology and information, and finance will be covered and discussed.

Undergraduate	Global Technology Management	Spring semester	Introduction to International Management	3	This course introduces students to the world of international business and management by studying cultural influences, government, and business structures in our global economy. Students also learn about trade relations, international finance and legal and marketing and promotion.
Undergraduate	Global Technology Management	Fall Semester	Statistics for Business	3	Utilized in many disciplines such as financial analysis, production and operations management, MIS, and marketing research, business statistics is the science of good decision making to overcome business uncertainty.
Undergraduate	Global Technology Management	ing and Fall Semes	Principles of Accounting	3	This is an introductory course in financial accounting from a user's perspective. The theoretical foundation and basic accounting terminology will be addressed. The basic financial statements consisting of the balance sheet, income statement will be presented and discussed. The course should enable students to critically analyze accounting information from an investor's or creditor's perspective.
Undergraduate	Global Technology Management	Fall Semester	Financial Management	3	This course focuses on applications of financial theory. Topics include, ✦ Financial Statements & Long-term Financial Planning ✦ Valuation of Future Cash Flows ✦ Capital Budgeting ✦ Cost of Capital & Long-term Financial Policy ✦ Short-term Financial Planning and Management There are no prerequisites for this course, however, it is strongly recommended that students possess basic quantitative and English skills
Undergraduate	Global Technology Management	Fall Semester	Marketing management	3	This course introduces students to various concepts, theories, and tools related to the strategic marketing process. Students learn how to create value for customers, to engage them, and to manage profitable customer relationships in the age of digital, mobile, and social media.
Undergraduate	Global Technology Management	Spring semester	Introduction to IT	3	In this course, students will learn the basic concept of information technology and how it works. Mainly, students will learn four major components of information & communication technology and state of the art IT trend. This course include the exercise of the office automation systems (MS office) with pragmatic approach.
Undergraduate	Global Technology Management	Spring semester	Social Entrepreneurship	3	Social entrepreneurship is the application of entrepreneurial thinking and processes to create enterprise focused on helping individuals in need and societies at large. Social entrepreneurs combine the knowledge and skills used in traditional business, with a passionate commitment to having a meaningful and sustainable social impact. The social entrepreneurs business is grounded in his or her own personal and social values, giving extra meaning and purpose to the enterprise itself. The most successful social enterprises solve important social problems through disruptive innovation and business model, and the greatest challenge for social enterprises is to not just find solve social problems, but to create an economic engine within the business to insure long-lasting sustainability. This course is a discussion- driven class the Socratic Method - rather than a traditional lecture course. Through discussion, debating, and critical thinking, students will identify core concepts of social entrepreneurship. Also, students will have a chance to create a unique opportunity to apply classroom concepts to real world problems through group projects. You will be designing your own social enterprises during the semester.

Undergraduate	Global Technology Management	ing and Fall Semes	Operations Management	3	Operations management (OM) has been a key element in the improvement in productivity in business around the world. Creating a competitive advantage through operations requires an understanding of how the operations function contributes to productivity growth. This course shows you what companies are doing to create competitive advantage through OM
Undergraduate	Global Technology Management	Fall Semester	Organizational Behavior	3	This course will provide understanding over a bunch of organizational behavior issues and human relations skills such as attitudes and behaviors, personality and emotions, motivations,work group/team, and decision making
Undergraduate	Global Technology Management	Spring semester	Behavioral Decision Making	3	Decision making is one of major activities in management. This course introduces psychological mechanisms of decision making and judgment and how tasks and contexts affect decision making and judgment. This course aims to help students to have insights on their own decision making and to make better decisions in their daily lives and in their careers in the future.
Undergraduate	Global Technology Management	Spring semester	Software Programming	3	This course is an introduction to the theory, design, and implementation of programming languages. Topics covered in this course include: environment settings, formal semantics of programming languages to develop simple application.
Undergraduate	Global Technology Management	Fall Semester	Data Mining for Business	3	This course teaches how to analyze business data using datamining techniques. The objective of this course is for the students to extract important information from business data and utilize it for making better decision making as a manager.
Undergraduate	Global Technology Management	Fall Semester	Technology Marketing	3	The course aims to understand marketing of high-tech products in the era of rapid technology development and innovation. The course covers characteristics of high-tech product market and consumers, basic principles of technology marketing, how to develop high-tech products and how to diffuse them into the market.
Undergraduate	Global Technology Management	Fall Semester	Introduction to Programming	3	Students would be familiar with programming after taking this course, Introduction to Programming. Since this is an introductory course, students will practice programming logics through a number of examples.
Undergraduate	Global Technology Management	Spring semester	Service Management	3	This course is offered in English. The modern industrial economies are dominated by employment in the service sector. Enterprises in the service sector should follow different management styles from those in the manufacturing industry in order to be successful. An effective competitive strategy is especially important for service firms because they compete in an environment where there are relatively low barriers to entry.
Undergraduate	al and Information Sytems Engi	Spring semester	Supply Chain Management	3	This course covers the major issues in supply chain management, including: definition of a supply chain; role of inventory; advanced production- inventory models; supply contracts; bullwhip effect and information sharing; information technology and supply chain management.
Undergraduate	al and Information Sytems Engi	Spring semester	Engineering Economy	3	During this course students will study the conceptual relations between value and cost, the computational procedures for determining each alternative's value, and economic analysis of public and/or private investments.
Undergraduate	al and Information Sytems Engi	Fall Semester	Engineering Statistics	3	This course provides students with the fundamentals of statistics, such as basic probability theory, random variables, expectations, variances, and various sample distributions. It also covers parameter estimation, hypothesis testing, regression analysis, and analysis of variance. The students will learn how to use R software and how to analyze the statistical problems by R.
Undergraduate	al and Information Sytems Engi	Spring semester	Introduction to Management Science	3	This course provides students with a body of knowledge to assist in the problem definition, model building, solution, validation, and implementation for engineering and management decision problems.

Undergraduate	al and Information Sytems Engi	Fall Semester	Linear Algebra	3	The course deals with basic matrix theory and linear algebra. Emphasis is given to topics that will be useful in other disciplines, including systems of equations, vector spaces, determinants, and eigenvalues.
Undergraduate	al and Information Sytems Engi	Fall Semester	Database	3	This course provides students with the fundamentals of database, which is the essence of all information systems. Students will learn the theory of database technology and its implementation.
Undergraduate	al and Information Sytems Engi	Fall Semester	Knowledge Management System	3	In this course, students will learn how the information technology technique (including knowledge, in particular) would be utilized in managing an organization effectively and efficiently
Undergraduate	al and Information Sytems Engi	Spring semester	Business and Marketing	3	Management is coordinating work activities so that they are completed efficiently and effectively with and through other people. And Marketing is the process by which companies create value for customers and build strong customer relationships to capture value from customers in return.
Undergraduate	al and Information Sytems Engi	Spring semester	Enterprise Resource Planning	3	The objective of this course is to introduce students to the value of Enterprise Resource Planning and to understand how ERP systems can be used to improve business processes by integrating business activities, including sales, marketing, manufacturing, accounting, and staffing. This course will focus on integrated information systems, which include enterprise resource planning systems (ERPs), back-office, front-office, SCM, and manufacturing resource planning systems. THIS IS NOT A HANDS ON ERP tool-based course, rather it is a precursor to deeper involvement in ERP management, implementation and, if desired, administration.
Undergraduate	al and Information Sytems Engi	Spring semester	Software Engineering	3	The objective of this course is to introduce students to the methodologies involved in the development and maintenance of software over its entire life cycle. This course includes different life cycle models, requirement dictation process, analysis modeling and specification, architectural design methods, implementation and testing strategies, verification and validation techniques, and project planning and management.
Undergraduate	al and Information Sytems Engi	Fall Semester	Investment Engineering	3	The major objective of the course is to introduce the basic concept and theories of finance and investment by covering principles that are applicable to all forms of investment- stocks, bonds, real estate, corporate finance, and so forth. This course briefly covers the financial system and reviews the structure and uses of corporate financial statements. Three analytical "pillars" of finance- optimization over time, asset valuation, and risk management- are discussed with a far greater emphasis on asset pricing and risk management. Although modern finance is a highly mathematical field, we will use mathematics only to enhance our understanding.
Undergraduate	al and Information Sytems Engi	Fall Semester	Project Management	3	This course provides students with basic knowledge and processes focused on scope, time, cost and risk management. Students also learn how to utilize project management software, like MS-Project, and the advanced PM method, like Critical Chain Project Management (CCPM).
Undergraduate	al and Information Sytems Engi	Fall Semester	Introduction to Fundamental Accounting	3	This module is an introduction to the basics of financial accounting. This module intends to highlight essential principles, knowledge, and techniques on transaction, journalizing, posting, and closing by which important financial statements are produced.
Undergraduate	al and Information Sytems Engi	Fall Semester	Communication	3	This course intends to enhance communication skills and capabilities as one of the human competences needed for successful organizational career and social life in the future. To attain this purpose, students will look out for the ideal human resource image which employers prefer, and learn related theories, knowledges and skills adopted from psychology, sociology, and anthropology.

Undergraduate	IT Management	Spring semester	Applied Statistics	3	This module aims to provide the student with the basic concepts of statistics. The student will learn about the sample statistics, various sample distributions and their applications. This module will enable the students to perform statistical analysis of the data obtained in a manufacturing system. Assessment is through a final examination, homework assignments and 1 quiz test about the usage of R software.
Undergraduate	IT Management	Fall Semester	Data Structure	3	This module provides the student with the knowledge on data structures and the basic algorithms that use the data structures and ability to decide one of them for a given problem. Every data structure and algorithm explained in this module will be based on an object oriented concept. The module will also cover advanced object oriented concepts such as the exception handling and generics.
Undergraduate	IT Management	Fall Semester	Computer Systems	3	This module is an introduction to concepts underlying all computer systems. More specifically, this module provides a programmer's view of how computer systems execute application programs, store information, and communicate with each other. This module also serves as a foundation for modules on operating systems, computer architectures, compilers, programming languages, computer networks, and embedded systems, where a deeper understanding of systems-level issues is required. Topics covered include data representations, assembly languages, processor architectures, the memory hierarchy, operating systems, compilers, linkers and loaders, and high-level application programming interfaces.
Undergraduate	IT Management	Fall Semester	Engineering Math	3	This module aims to provide students with the mathematical topics interested in IT fields to understand several systems, processes and algorithms. To achieve this goal, this course introduces the fundamental concepts in linear algebra because linear algebra is a basic for the most mathematical analysis and various applications in IT. This module covers systems of linear equations, matrices, vector spaces, basis, rank, linear transformation, inner product, etc. and presents application areas of linear algebra related with IT. Finally, this module provides a tutorial to apply linear algebra to real problems using a programming language.
Undergraduate	IT Management	Spring semester	Database Practice Web programming	3	In this module, students will conduct laboratory works and application development with database design and implementation, and build essential parts for an operating system. Students will improve their skills in applying what they have learned in ITM411, and extend their understanding in data and system architectures in IT systems. Students will also have an opportunity in developing web applications utilizing DBMS.
Undergraduate	IT Management	Spring semester	Operating Systems Design	3	The goal of this course is to provide an introduction to the internal operation of modern operating systems. In particular, the course will cover processes and threads, mutual exclusion, CPU scheduling, deadlock, memory management, and file systems.
Undergraduate	IT Management	Spring semester	Algorithm	3	This module provides the student with the knowledge on algorithms and ability to decide the algorithm for a given problem. The module also help student to analyse the efficiency of a given algorithm.

Undergraduate	IT Management	Fall Semester	Supply Chain Management	3	This course explores the key issues associated with the design and management of Supply Chains. Supply Chain Management (SCM) is concerned with the efficient integration of suppliers, factories, warehouses and stores so that products are distributed to customers in the right quantity and at the right time. This module provides the student with the ability to develop understanding of the concepts, processes and approaches for the operations and supply chain management and strategies in various service and operations in business information systems. Also, students will learn how to apply quantitative methods of analysis to support decision-making in supply chains. Case studies are used to discuss practical and up-to-date supply chain issues.
Undergraduate	IT Management	Fall Semester	Organizational Behavior	3	• Organizational Behavior is a field of study that investigates the impact individuals, groups, and structure have on behavior within organizations, for the purpose of applying such knowledge toward improving an organization's effectiveness. • This module aims to acquire knowledge on individual, group, and corporate level behavior within organizations, by which students will be ready to cultivate their HR competency needed for carrying out their effective organizational life. • This module covers the following themes; 1) Individual Behavior such as Diversity in Organizations, Attitudes and Job Satisfaction, Emotions and Moods, Personality and Values, Perception and Individual Decision Making, and Motivation, 2) Group Behavior such as Communications, and Leadership, 3) Corporate Level Behavior, i.e. HR Policies and Practices. • The teaching consists of lecture, team presentation on a given topic or issue, and open/unstructured discussion. • The assessment consists of mid-term and final exam(multiple choice + essay), homework report, team presentation. And verbal and written feedback will be given.
Undergraduate	IT Management	Fall Semester	High Tech Marketing	3	This module gives students in-depth knowledge in major concepts and theories to the high-tech marketing practice. Topics can be categorized into three parts: basic marketing principles (marketing processes and planning, market segmentation, marketing mix), high-tech marketing principles (technology-intensive business, chasm theory, and marketing analytics (using R software).
Undergraduate	IT Management	Fall Semester	Artificial Intelligence	3	This module gives students in-depth knowledge in major concepts and theories to the high-tech marketing practice. Topics can be categorized into three parts: basic marketing principles (marketing processes and planning, market segmentation, marketing mix), high-tech marketing principles (technology-intensive business, chasm theory, and marketing analytics (using R software).
Undergraduate	IT Management	Spring semester	Computer Language	3	This module aims to provide an basic understanding of software solutions: their analysis, design, development and implementation including appropriate methodologies and skills in the use of an event driven language for open source development (Java). This module focuses on Object Oriented Programming using Java, implementing designs which have been developed using UML to show the direct link between UML and OOP.
Undergraduate	IT Management	Spring semester	Database Management	3	This module provides students with the fundamentals of database, which is the essence of all information systems.

Undergraduate	IT Management	Spring semester	Accounting Principles	3	Accounting is one of the most essential tools to be used for business model setting, performance measurement, budgeting & planning in any business including non-profits. To understand the basic concept of accounting through this lecture would help you sometime in the future when you are working in a business enterprise to understand 1) how business activities in the enterprise are translated into the financial numbers 2) how to make important business decisions such as long-term resource commitment by utilizing the basic accounting and finance concepts. The module aims to provide foundations to understand basic accounting concepts/principles so that students will be able to read and write financial statements and grasp the idea of basic financial management.
Undergraduate	IT Management	Fall Semester	Software Engineering	3	Software engineering is one of modules for Level 4. The objective of this module is to introduce students to the methodologies involved in the development and maintenance of software over its entire life cycle. This module includes several life cycle models, requirement dictation process, analysis modelling and specification, architectural design methods, implementation and testing strategies, verification and validation techniques, and project planning and management.
Undergraduate	IT Management	Spring semester	Fundamentals of Finance	3	This module briefly covers the financial system and reviews the structure and uses of corporate financial statements. Then, three analytical "pillars" of finance- optimization over time, asset valuation, and risk management- are discussed. Its focus is on principles rather than institutional structures, although some discussion of institutions is given. The module will be delivered via a combination of lectures and directed and independent learning. Assessment consists of quizzes and a final examination. The student will receive formative feedback throughout the lectures.
Undergraduate	IT Management	Fall Semester	Management Science	3	This module focuses the study of concepts relating to management science in various informations applied service & operations organizations. The management science is simply a scientific approach to decision making that seeks to best design and operate a system, usually under conditions requiring the allocation of scarce resources. Quantitative methods of analysis used to support decision making in the various operations management activities will be employed to relate theory to practice. Students can obtain broad knowledge of mathematical and probability models. And they are given several problems, which are carefully chosen to practice management science techniques
Undergraduate	IT Management	Fall Semester	IT Investment Analysis	3	The purpose of this module is to provide a comprehensive treatment of commonly used and more recently applied methodologies for technology investment decision making. The module introduces students to an in-depth treatment of a wide-variety of decision making methodologies focused on the subject of investing in IT. Delivery is primarily via a mixture of lectures and project presentations, and assessment is in the form a 120 minutes examination.
Undergraduate	IT Management	Spring semester	Strategic Technology Management	3	Technology innovation management is a rapidly emerging area as technological innovation has been at the core of sustainable competitive advantage for firms. The module provides an overview of technological innovation management with an emphasis on the integrative relationship of technology development with strategic planning, marketing, finance, engineering and operations over the entire life cycle of technology. Through a combination of lectures, case studies, and a term-project, this module will examine not only the fundamentals of managing innovation and technological dynamics, but also the formulation and implementation innovation strategies within an organization. Assessment will be made based on case presentations, term-project outputs, and final exam.

Undergraduate	IT Management	Fall Semester	Business Analytics	3	This module aims to provide students with technologies, applications, practices, and skills for continuous iterative exploration and investigation of past business performance along with external data generated from diverse sources such as web and social network service (SNS) to gain insights and drive business planning. Topics covered in this module include statistical and quantitative analysis, explanatory and predictive modelling. While several data mining algorithms including basic unsupervised/supervised learning algorithms are especially empathized in ITM 516 Data Mining module, this module covers the whole process of data mining consisting of data collection, prepressing, modelling and analysis. This module comprises lectures and programming exercises to implement business analytics techniques. The students are assessed by mid-term exam in the middle of the semester, the final-exam at the end of the semester, and a set of (2~4) programming assignments during the course and the term project.
Undergraduate	IT Management	Spring semester	IT Project Management	3	This module gives students in-depth knowledge in major concepts and theories to the high-tech marketing practice. Topics can be categorized into three parts: basic marketing principles (marketing processes and planning, market segmentation, marketing mix), high-tech marketing principles (technology-intensive business, chasm theory, and marketing analytics (using R software).
Undergraduate	IT Management	Spring semester	Consultancy Project	3	This module is essentially a practical, hands-on application of business principles. It aims to introduce students to consulting methodology and to put students into the real world situation of solving problems for business. There are some simulated consultancy exercises. At the end of the module, each group of students will be expected to present their term project in report format and to give a formal presentation.
Undergraduate	IT Management	Fall Semester	Principles of Economics	3	This course offers an opportunity to understand basic economic principles and theories –both micro-economics and macro-economics. Focus, however, will be given more to application of the theories so than students are motivated to understand economics by seeing how it relates to their own real lives. Aim of the lecture is to increase students' economic literacy both by developing their aptitude for economic thinking and by presenting key insights about economics that every educated individual should know. Students will learn from inductive approach, in which they are first confronted with a question and then led through the process of how to answer that question. Students will get feedback about their progress from these Q&As.
Undergraduate	IT Management	Fall Semester	Fundamentals of Business Information Syste	3	The module is designed to introduce students to the components of Information Communication Technology (ICT) and the need to study business information systems, understand the concept of a system and identify the importance of a systematic approach to the study of information systems. In addition, there will be coverage of the different types of general information systems that exist in the business organization, introduction to the concept of a systems development framework and associated issues and recognition of the importance of people in the development process. Emphasis will also be placed on how businesses can use ICT to meet their business needs.

Undergraduate	IT Management	Fall Semester	Business Process Management	3	This module introduces a process-oriented view of the flows of materials, information, products and services through and across organizational functions. All organizations must carefully analyze and document their business processes and must continuously assess the efficiency and effectiveness of these processes to minimize cost and maximize value creation.
Undergraduate	IT Management	Spring semester	Computer Networks	3	The module aims to provide students with an understanding of the role and internal operation of computer networks. It introduces basic concepts and technologies, with specific reference to the Internet, in order to give students an understanding of the demands placed upon computer networks, and the technology required for them to successfully support current and emerging applications.
Undergraduate	IT Management	Spring semester	Engineering Economy	3	This module aims to provide the student with an introduction to economic decision making. This covers the basics of economic analysis from an engineering perspective, dealing with the principles and methods for analyzing the economic feasibility of alternatives and for making selection decisions among them. The student will learn how to perform economic evaluation and develop cost models for problem solving. Concepts in this class are equally applicable to engineering, business and financial systems problems. Assessment is through a final examination, plus a midterm exam given during the semester.
Undergraduate	IT Management	Fall Semester	Operations Management	3	This module provides the student with the ability to develop understanding of the concepts, processes and approaches for the operations and supply chain management and strategies in various service and operations in business information systems.
Undergraduate	IT Management	Spring semester	Data Mining	3	This module aims to provide students with the theoretical and practical knowledge and skills to collect, modify, and analyse a large amount of data from various sources. Topics covered in this module include basic unsupervised/supervised learning algorithms, novelty detection algorithms, custering methods, and association rules such as k-nearest neighbour, Naïve Bayesian classifier, decision tree, and support vector machines, clustering algorithms including K-Means and hierarchical clustering, and A-priori rules. This module comprises lectures and programming exercises with Python language to develop the practical skills of data mining. The students are assessed by one quiz in the middle of the semester, the final-exam at the end of the semester, and a set of (2~4) Python programming assignments during the course.
Undergraduate	IT Management	Fall Semester	Mobile Programming	3	1. This module introduces the programming technologies and design approaches for mobile computing systems. 2. Students study relevant applications to understand them better. 3. This module gives students a chance to construct their own application on a widely-used mobile platform.
Undergraduate	IT Management	Fall Semester	System Analysis and Design	3	This module provides students with the knowledge on object oriented principles like encapsulation and delegation to build applications that are flexible. Some design patterns explained in this module help students to solve their problems more efficiently. The module will also cover UML, use cases, and diagrams to ensure that all stake holders are communicating clearly to help students deliver the right software that meets everyone's needs.
Undergraduate	IT Management	Fall Semester	Human Resource Management	3	Organizational Behavior is a field of study that investigates the impact individuals, groups, and structure have on behavior whithin organizations, for the purpose of applying such knowledge toward improving an organization's effectiveness.

Undergraduate	IT Management	Fall Semester	Enterprise Resources Planning	3	Enterprise Resource Planning (ERP) software programs are at the cutting edge of information systems technology. ERP systems help to manage company-wide business processes, using a common database and shared management reporting tools. Student will learn how ERP systems support the efficient operation of business processes by integrating business activities, including sales, marketing, manufacturing, accounting, and staffing. The module will be delivered via a combination of lectures and directed and independent learning. Assessment consists of quizzes and a final examination. The student will receive formative feedback throughout the lectures.
Undergraduate	IT Management	Fall Semester	Security Practices	3	In this module, students will have an oppertunity to develope security-related software modules through practices and homeworks. Students will conduct 5~6 developement projects or practices and make presentations on their outcomes. This module is a practice module for ITM 512 (Information Security)
Undergraduate	IT Management	Spring semester	Information Security	3	This module focuses on computer security and computer viruses. Both technical and social issues are covered. The students will receive theoretical and practical teaching on computer security related issues.
Undergraduate	cturing Sytems and Design Engi	Fall Semester	Physics and Experiment(advanced,2)	3	Physics-II is a first-year physics course that introduces students oscillations and mechanical waves, thermodynamics, electricity and magnetism, light and optics, and modern physics.
Undergraduate	cturing Sytems and Design Engi	Spring semester	Physics and Experiment(advanced,1)	3	Physics-I is a first-year physics course that introduces students physics and measurement, motion in one dimension, vectors, motion in two dimensions, the laws of motion, circular motion and other applications of Newtons laws, energy of a system, conservation of energy, linear momentum and collisions, rotation of a rigid object about a fixed axis, static equilibrium and elasticity, universal gravitation, fluid mechanics, oscillations and mechanical waves.
Undergraduate	cturing Sytems and Design Engi	Spring semester	Engineering Mathematics I	3	This module provides the student with the fundamental knowledge of mathematics to solve engineering problems. Topics included are ordinary differential equation, Laplace transform and their applications to physical problems, and partial differential equation.
Undergraduate	cturing Sytems and Design Engi	Spring semester	Mechanics of Materials	3	Analysis and design of structural members subjected to tension, compression, torsion, and bending are main topics of this unit. Specialised topics such as thermal effects, dynamic loading, non-prismatic members, beams of two materials, shear centres, pressure vessels and statically indeterminate beams are investigated.
Undergraduate	cturing Sytems and Design Engi	Spring semester	CAD I	3	This module provides basic introduction to the structure and properties of engineering materials and their significance to engineering application and design. It also reviews non-destructive techniques for the evaluation of defects in engineering materials and their structures.

Undergraduate	cturing Sytems and Design Engi	Spring semester	Computer Programming	3	This module enables students to use C language which is the most popular high level language among C, FORTRAN, Pascal, and Basic. They learn grammar - types of variables, control loops, functions, subroutines, file input/output, user interface, etc and practice programming. The programming exercises consist of serial communication, numerical analysis, solution search algorithm.
Undergraduate	cturing Sytems and Design Engi	Fall Semester	Engineering Mathematics II	3	This module provides the student with the fundamental knowledge of mathematics to solve engineering problems. Topics included are vectors and matrices, vector analysis, complex numbers, and functions of a complex variable.
Undergraduate	cturing Sytems and Design Engi	Fall Semester	Energy Studies	3	The properties and behaviours of thermal fluid are introduced and the processes whereby they undergo changes of state are examined. The basic laws of Thermodynamics, Fluid mechanics, Heat transfer coupled with the conservation equations, Energy, Momentum, and Mass together with state relationships are then applied to various thermal flow and its machines and earth environment.
Undergraduate	cturing Sytems and Design Engi	Fall Semester	Introduction to Manufacturing	3	The characteristics of the whole manufacturing process methodologies such as machining, casting, forging, joining are covered, along with the related processes and techniques such as surface finishing, electronic fabrication, automation and integration of the production systems. An emphasis will be put on the laboratory works.
Undergraduate	cturing Sytems and Design Engi	Fall Semester	Applied Statistics in Manufacturing	3	This course deals with the basic concepts of statistics such as random variables and probability distributions. This course focuses on the sample statistics, hypothesis testing, regression, analysis of variance, etc. This course will enable the students to perform statistical analysis of the data obtained in a manufacturing system.
Undergraduate	cturing Sytems and Design Engi	Spring semester	Design of Machine Elements	3	This is the first course that presents mechanical engineering students with design challenges rather than set-piece problems. To understand dynamics, statics, physics of operations, and structural details of machine elements is necessary to build machinery that works safely, reliably, and well by satisfying constrains of material strength and fatigue life.
Undergraduate	cturing Sytems and Design Engi	Spring semester	Control	3	This module covers analysis and design of mechanical control systems. Basic control method in this module is a classical control method. Main subjects are (1) block diagram modelling of components and systems, (2) time domain, s-domain and frequency domain analysis, (3) control algorithms, (4) root locus method and frequency domain compensator design. As a tool, MATLAB is used for analysis and design of control systems. In the final stage, an experiment for DC motor position control is performed.
Undergraduate	cturing Sytems and Design Engi	Fall Semester	Dynamics	3	This module provides the theory and applications of engineering mechanics. Force, velocity and acceleration of a particle and rigid body are considered. Work and energy, impulse and momentum are also analyzed. The dynamic theory is applied to the real engineering problems.

Undergraduate	cturing Sytems and Design Engi	Fall Semester	Intermediate Engineering Design	3	This course covers principle and theory of computer application of manufacturing and how to integrate enterprise elements. The subjects are introduction of manufacturing, design and production elements of CIM, and computer based systems of the CIM enterprise, principles of NC and automation system, and operation of NC and CNC.
Undergraduate	cturing Sytems and Design Engi	Fall Semester	essor and Computer Automation in Man	3	This unit covers fundamental topics for analyzing micro-controller's structures and programming. Also, this introduces a computer automation system. The applications to actuators such as DC motor, step motor, and other automated sensors and actuators will be covered.
Undergraduate	cturing Sytems and Design Engi	Fall Semester	Computer Aided Engineering	3	The module concentrates on the basic theory of the Finite Element Method (FEM) and its applications by using the CAE commercial program such as the ANSYS. Before making and analysing a modelling using the ANSYS, solid mechanics are reviewed to make the students understand the theoretical backgrounds. The basic concept is introduced at the beginning while considering one dimensional problems and its extension to two and three dimensional problems is briefly discussed. Applications to one and two dimensional problems are discussed.
Undergraduate	cturing Sytems and Design Engi	Fall Semester	Management of Manufacturing Sytems	3	This module addresses the various production management concepts, skills and their applications. The production of goods and services is viewed as the integration of human and technical systems within a specific environmental context that is increasingly global in scope. The module consists of emerging manufacturing paradigms, manufacturing strategies, theories and applications about demand forecasting, production planning and control, inventory control, and relating topics. Mainly focused on the industry applications and their tools.
Undergraduate	cturing Sytems and Design Engi	Spring semester	Creative Design	3	This module is intended to familiarize engineering students with the nature of design and how it done as the first introductory course of engineering design. A definition of design, difference between analysis and open ended design, nine step model of design, process of design-fabrication-evaluation, way of creative design and design project are included in the course.
Undergraduate	cturing Sytems and Design Engi	Spring semester	Fluid Mechanics	3	This module aims to provide the student to learn about relations of viscosity, velocity, density, pressure, force and momentum, and the basic concepts of static and dynamic behaviour of fluid flow. Students then learn basic equations such as Bernoulli, continuity, momentum, and energy equations and their applications. Students learn internal viscous flows and friction losses in a piping system.
Undergraduate	cturing Sytems and Design Engi	Spring semester	Engineering Economics	3	This module aims to provide the student an introduction to economic decision making. This covers the basics of economic analysis from an engineering perspective, dealing with the principles and methods for analyzing the economic feasibility of alternatives and for making selection decisions among them. The student will learn how to perform economic evaluation and develop cost models for problem solving. Concepts in this class are equally applicable to engineering, business and financial systems problems. Assessment is through mid-term and final examinations, plus a number of assignments and quizzes.

Undergraduate	cturing Sytems and Design Engi	Spring semester	Engineering Optics	3	This module aims to provide the student to learn about science and engineering knowledge and theories of optics. Students learn about properties of light and its mathematical model, optical components and their characteristics, geometric and wave optics which include lens, mirror, interferometers, polarization, and diffraction. The learning outcomes are abilities of using mathematical methods relevant to the optics, and designing an optical system or process and demonstrate its feasibility through testing or simulation. Assessment is through mid-term and final examinations and 5 experiments and a project that needs to explore an optical method to measure a mechanical property with a high precision
Undergraduate	cturing Sytems and Design Engi	Fall Semester	Tribology	3	Tribology is the science and technology of interacting surfaces in relative motion and of related subjects and practices. The module presents current insights into tribology, dealing with following areas in detail: Surface, Mechanics of solid contacts, Friction, Wear, Lubrication, Surface modification technology. Experimental techniques and relationships in friction and wear.
Undergraduate	cturing Sytems and Design Engi	Fall Semester	Robotics	3	This module covers analysis and design of robot system. Main subjects are (1) robot kinematics, (2) Jacobian, (3) trajectory planning, (4) sensor and actuators, (5) robot vision. As a tool, MATLAB is used for analysis of robot kinematics. In the final stage, experiments using the motor-sensor control kit are performed
Undergraduate	cturing Sytems and Design Engi	Fall Semester	Introduction to Electrical Engineering	3	This module aims to provide freshmen level students with a fundamental understanding of basic Electromagnetic theory and basic electronic circuit theory. Learning will be through lecture and where ever possible practical experience. The objective of the module is to prepare students for further studies in Electronics based courses
Undergraduate	cturing Sytems and Design Engi	Spring semester	ofessional Communication for Engineers	3	This module introduces students to the principles of effective English communications for Oral presentations and report writing. It also provides them with effective study skills for learning in English. The teaching strategy is based mainly around team activities in the classroom, with small group discussions on communication strategies followed by a presentation of ideas to the class and debate.
Undergraduate	cturing Sytems and Design Engi	Fall Semester	Electronic Circuits	3	This module aims to provide students with knowledge for the analysis and design of electronic devices and circuits. The module mainly focuses on mathematical modelling and analyses of AC/DC circuits, transients, operational amplifiers, diode circuits, transistor amplifiers and fundamental digital logic principles. Circuits are designed for the purposes of filtering, amplifying conditioning and switching Hands-on labs and computer-aided analyses for various electronic circuits enhance the students' understanding of the topics. The module will be delivered via a combination of lectures, labs, and directed and independent learning. Assessment consists of labs and an examination.
Undergraduate	cturing Sytems and Design Engi	Fall Semester	ofessional Communication for Engineers	3	This module is designed to develop those skills identified by employers as being necessary for effective communication and performance at work. It will help you plan your career, make successful job applications and enhance your interpersonal skills. This module is also designed to develop the study skills for the IELTS test.
Undergraduate	cturing Sytems and Design Engi	Spring semester	Signals and Systems	3	This module is an introduction to analog and digital signal processing, a topic that forms an integral part of engineering systems in many diverse areas. The covered topics include basic properties of signals and systems, the processing of signals by linear systems, Fourier series and transforms, sampling, discrete-time processing of continuous-time signals.

Undergraduate	cturing Sytems and Design Engi	Spring semester	Materials Technology	3	This module provides basic introduction to the structure and properties of engineering materials and their significance to engineering application and design. It also reviews non-destructive techniques for the evaluation of defects in engineering materials and their structures
Undergraduate	cturing Sytems and Design Engi	Spring semester	CAD/CAM	3	This course introduces a system and tools that demonstrates the integration of Computer-Aided-Design (CAD) and Computer-Aided-Manufacturing (CAM). This course emphasizes the computer automation of design and manufacturing systems. This is a study of modern prototyping and machining methods, teaching the use of specific software for converting 2D and 3D CAD drawing geometry directly into toolpath information used to drive numerically controlled turning and milling machines.
Undergraduate	cturing Sytems and Design Engi	Spring semester	Digital Signal Processing	3	This module aims to provide students with the basic knowledge and practical ability to design digital circuits for various digital signal processing applications and for controlling systems using various digital devices. The devices studied will include programmable logic controllers (PLC's), programmable logic devices (PLD's) and Digital Signal Processors (DSP's). Assessment consists of Labs and an examination.
Undergraduate	cturing Sytems and Design Engi	Spring semester	MEMS/Nano Engineering Labs	3	This module aims to provide the student the basic knowledge of micro/nano fabrication processes. This is achieved through the hands-on experiment which is fabricating a simple micro/nano device and testing a device. The student will learn micro/nano fabrication processes and related equipments. Assessment is through the group presentation and individual report of experiment.
Undergraduate	cturing Sytems and Design Engi	Spring semester	Mechanical Vibrations	3	The objective for this module is for students to learn analytical, experimental, and numerical treatment of vibration phenomena. Topics include linear oscillator analysis (Laplace Transforms, complex harmonic balance, Fourier Transform, eigenvalue problems, modal analysis, simulation), experimental methods, and an introduction to nonlinear dynamic systems. Free and forced vibrations of mechanical systems with lumped inertia, springs, and dampers are the primary emphasis.
Undergraduate	cturing Sytems and Design Engi	Fall Semester	Sustainable Engineering	3	This module provides students with the knowledge and understanding to integrate sustainable development and environmentally conscious designs into the engineering cycle. The schedule includes the role of the designer in the reduction of environmental impact using the vehicle of design: recycling, component re-use sustainable materials selection the manufacturing and remanufacturing (deconstruction and refurbishment), life-cycle considerations, analyses, trade-offs, appropriate standards e.g. ISO14001 and ISO14044.
Undergraduate	cturing Sytems and Design Engi	Fall Semester	Non-traditional Manufacturing Laboratory	3	Manufacturing processes making use of electrical, chemical, ultrasonic, magnetic, and photonic sources of energy are referred to as Nontraditional manufacturing technologies. These energy field-assisted processes allow innovative approaches to material processing and improve the productivity and overall quality of the finished product. These manufacturing processes are also applied to fabricate microchip in the semiconductor industries. The course introduces nontraditional manufacturing technologies including microelectronic fabrication process, explains how products are made, and describes how manufacturing problems are solved. Through various laboratory works, students will easily have chance to practice technologies.
Undergraduate	cturing Sytems and Design Engi	Fall Semester	echanical Engineering Systems Laborato	3	This module provides mechanical experimental laboratories. Knowledge and characteristics on mechanical behaviors such as stress/strain and bending, thermal system behavior such as heat transfer and heat pump, fluid flows, and mechanical vibrations are delivered.

Undergraduate	cturing Sytems and Design Engi	Fall Semester	Undergraduate Research	3	Undergraduate research is a search or discovery of new information; an adventure into solving real world problems. Having research experience is critical when applying for graduate and professional schools and is impressive to prospective employers as well. All students who want to do the undergraduate research must have a permit by the MSDE faculty.
Undergraduate	cturing Sytems and Design Engi	Spring semester	Database Management	3	This module provides students with the fundamentals of database, which is the essence of all information systems used in a manufacturing system.
Undergraduate	cturing Sytems and Design Engi	Fall Semester	Statics	3	Systematically interpret the balance of force in the static state of a mechanical system that systematically interprets the effect of force acting on mechanical systems. Construct a freehand object and learn to use it by utilizing mathematical knowledge such as vector, trigonometry, and integral calculus. Develop the basic ability to develop the ability to apply the original mechanical system to understand the existing mechanical system and to design the new mechanical system, and to establish basic mechanics, mechanical mechanics, and mechanical mechanics that are based on statics of the underlying mechanics .
Undergraduate	cturing Sytems and Design Engi	Spring semester	Physics and Experiment(general,1)	2	Physics-I is a first-year physics course that introduces students physics and measurement, motion in one dimension, vectors, motion in two dimensions, the laws of motion, circular motion and other applications of Newtons laws, energy of a system, conservation of energy, linear momentum and collisions, rotation of a rigid object about a fixed axis, static equilibrium and elasticity, universal gravitation, fluid mechanics, oscillations and mechanical waves.
Undergraduate	cturing Sytems and Design Engi	Subject to change	3	2	Physics-II is a first-year physics course that introduces students oscillations and mechanical waves, thermodynamics, electricity and magnetism, light and optics, and modern physics.
Undergraduate	School of Liberal Arts	Fall Semester	Understanding Movies	3	This course follows major thematic threads in cinema studies such as trauma, memory, and realism. By way of comparing the cultural and aesthetic aspects of European and Korean cinemas, this course seeks to understand how each national cinema depicts cultural wounds and social healings. Furthermore, this course poses the following questions: how do national traumas affect the social unconscious and render problematic the pre-existing national imagery; how do attempts to efface social wounds correspond to desires for realism; how do gendered representations contribute to (re)establishing national identity, and so on.

Undergraduate	School of Liberal Arts	Spring semester	Movie and Society	3	In this course we trace the trajectory and contours of such changes in cinematic depictions of Asian cities, examining the influence of relevant socio-political transformations (e.g., democratic revolutions, rapid economic growth, economic crises) as well as of contemporary issues associated with memory and urbanism. In so doing, we explore how cities in Asian films, through their interaction with such cinematic emblems, respond to, or come to terms with, the social change and crises that have preceded all successive transformations of Asian society. We will also consider how these changing notions of cities are entangled with a historical consciousness and impulse towards reflection on the past, phenomena that have pervaded many Asian countries in recent decades after undergoing modernization at a break-neck pace. Additional topics include concepts of gender, modernity, and (trans-)nationalism.
Undergraduate	School of Liberal Arts	ing and Fall Semes	Calculus(1)	3	The main goal of this course is to study the calculus for developing creative and applicable mathematical thinking systems and for learning necessary mathematical principal concepts and techniques for science majors in the engineering area. We will study derivatives and integrations of functions and their applications with various applied problems.
Undergraduate	School of Liberal Arts	ing and Fall Semes	Calculus(2)	3	The main goal of this course is to study the calculus for developing creative and applicable mathematical thinking systems and for learning necessary mathematical principal concepts and techniques for science majors in the engineering area. We will study derivatives and integrations of functions and their applications with various applied problems.
Undergraduate	School of Liberal Arts	Spring semester	world of Knowledge	2	This course covers various topics such as family, religion, gender, class, and education among others with a special focus on ethics
Undergraduate	School of Liberal Arts	ing and Fall Semes	Ethics in Modern Society	3	This course will deal with topics focusing on ethics. Each student wii be asked to attend lectures and exams.
Undergraduate	School of Liberal Arts	ing and Fall Semes	Writing and Presentation	2	This course will introduce students to common English standards in academic writing and presentation. Students will choose and develop a research project idea while the instructor guides students to write and present their research.
Undergraduate	School of Liberal Arts	ing and Fall Semes	Recognition to Korean History	3	This course will provide an overview of Korean history and culture from earliest times to the late twentieth century. It will examine a variety of major issues and individuals in the political, social, economic, and cultural history of Korea. This course will explore particular themes relevant to understanding Korea such as Confucianism, Buddhism, gender relations, foreign relations, colonializm, and popular culture in Korea today. It will help provide a broader perspective of understanding Korean culture and history within the larger context of world history, as Korean history must be viewed as products of interaction with the rest of the world and not development in isolation. This course will combine lectures with a variety of visual resources (films, TV dramas, documentaries, etc.) and field trip when necessary.
Undergraduate	School of Liberal Arts	ing and Fall Semes	Modern Society and Philosophy	3	Introduction to Wetern Philosophy

Undergraduate	School of Liberal Arts	ing and Fall Semes	Understanding Politics	3	This course is an introduction to politics in a globalised world, with a focus on how political science tries to understand and explain cross-country and cross-time differences. This course will begin by introducing students to some of the main empirical variations in political behavior, institutions, and outcomes across the world, and introducing students to some of the basic theoretical ideas and research methods in political science. This course introduces students to the key concepts and ideas underpinning modern politics, as well as contemporary challenges. This course examines the two foundational concepts of modern politics: the state and citizen. Under this general rubric, we will consider ideas such as power, authority, sovereignty, ideologies, democracy, rights, and international relations. This course also introduces students to studying and arguing about the challenges of modern politics, such as globalization and identity politics.
Undergraduate	School of Liberal Arts	ing and Fall Semes	Literary Imagination	3	This course gives students the opportunity to learn more about themselves and their worlds through exploration of the literary imagination. By reading and discussing the ways a variety of authors represent the most important issues in their own lives, we will gain insight not only into the nature of literature, but also into the human condition itself. Late 19th and 20th century short fiction from prominent U.S. authors will be our main focus.
Undergraduate	School of Liberal Arts	ing and Fall Semes	Creative Thinking	2	We need to build separate methods and orders with existing materials for creation. It means there is no normative way for creative thinking. Thus, this course focuses on providing several moments for each student to access to creative thinking. The process is as followed: 1. We will play around with keywords such as 'creation', 'translation(or interpretation)', 'action(or practice)', 'critics', 'arts', 'self'. 2. We will enjoy various genres of artworks related to these keywords. 3. We will try to extract relationships between the keywords and get close to understandings of creation through discussion about artworks. 4. We will exercise our understandings of creation in diverse ways.
Undergraduate	School of Liberal Arts	ing and Fall Semes	Physics and Experiment(general,1)	3	In the course of Physics and Experments (1), students who major on Science and Engineerings learn and understand basic principles on Newtonian Mechanics, the three-dimensional motion of a rigid body, Fluid Mechanics, Vibrations and Waves. Therefore they are supposed to obtain the ability to apply basics principles to the real world.
Undergraduate	School of Liberal Arts	ing and Fall Semes	Physics and Experiment(general,2)	3	In the course of Physics and Experiments (2), science and engineering students learn Thermal Physics, Electromagnetism and Circuit Theory as basic knowledge required in thier major courses. Students are supposed to understand those basic principles and apply them to given problems.