교과목 설명

연번	교과목코드	교과목명(국문)	교과목명(영문)	교과목 설명(Course Description)
1	EEE201	회로이론 및 실험	Basic Circuit Theory and Laboratory	The aims of this course are to make the students understand the principles and the fundamental concepts of circuit analysis; to develop the student's familiarity and understanding in modeling and analyzing circuits through a variety of real-world examples; and to extend the student's ability to apply system analysis to other branches of engineering. Memory, circuits, communication and control system, design of VLSI, magnetically coupled networks, power analysis, laplace transform, capacitor, inductor, and polyphase circuits are main topics of the course. The PSpice tool will be introduced and used for basic experiments. This course is focused on both hands-on experience and design practice.
2	EEE202	디지털 로직 및 실험	Digital Logic and Laboratory	To understand the basic principles of digital logic circuit, this course introduces the fundamental concepts, components and operations of digital systems. The topics to be covered include the theories of binary numbers, Boolean algebra, combination/sequential logics, registers, and counters and their implementation via hardware description languages.
3	EEE204	전자기학 I	Electromagnetics I	This course is the first half of one-year electromagnetics course. It deals with basic electro- and magnetostatic phenomena and the related theories using vector calculus, such as coulomb and ampere law, electric and magnetic fields and their boundary conditions at the interface of different media. It also covers the fundamental aspects of dielectric and magnetic materials, and electromagnetic induction.
4	EEE205	신호 및 시스템	Signals and Systems	This course introduces time-domain frequency domain response using Fourier series, Fourier transform, Laplace transform, discrete Fourier series and transform, sampling, z-transform, relationship between time and frequency descriptions of discrete and continuous signal and linear time invariant systems.
5	EEE223	전기전자공학 프로그래밍	Electrical Engineering Programming	This course includes basic programming skills to perform analysis, simulation, implementation of models for Electrical Engineering. With popular programming tools such as Python, Matlab, C++, students will build simple but practical systems for machine learning, communication, signal processing, controller etc. At the end of this course, students will be familiar with basic tools, and be able to apply their programming skills for implementing and simulating basic electrical engineering systems.
6	EEE231	전자기학II	Electromagnetics II	The core objective of this course is to study electromagnetic waves. For that purpose, we will learn fundamentals of electromagnetic waves, transmission lines, waveguides, cavities, and antennas.
7	EEE241	물리전자	Physical Electronics	This course covers fundamentals of quantum mechanics and solid-state physics, which are essential for studying semiconductor devices such as photonic devices, electronic devices and integrate circuits. Various interesting device examples in real applications will be discussed together. This course will be a preparation for courses Electronic Devices I, Optoelectronics, and Nanophotoncis.
8	EEE301	통신 및 정보 이론	Communications and Information Theory	This course introduces core concepts in analog and digital communication systems. The topics include Fourier transform, communication signals, amplitude modulation (AM), phase and frequency modulation (PM and FM), noise in communications, techniques in analog to digital transformation (sampling and quantization), and an introduction to source and channel coding.
9	EEE302	전기에너지시스템	Electric Energy Systems	This course introduces elements of modern electrical energy systems, including energy resources, energy conversion, power delivery and processing. The course also covers the basic principles on power converters and electromechanical energy conversion.
10	EEE303	전자회로 I 및 실험	Microelectronics I and Laboratory	This course covers an introduction to electronic circuits and the analysis and design of transistor amplifiers. First, the course extensively explains the basic operation principles of diodes, BJTs, and MOSFETs derived from physical structures and gives a concept of equivalent device models. Then, we will study the design and analysis of basic BJT and FET amplifiers and differential and multi-stage amplifiers.
11	EEE304	반도체공학	Semiconductor Engineering	This course covers fundamental physical concepts related to electronic devices, i.e., crystal structure of semiconductor materials, electronic energy band, dopants, carrier transport. Then it introduces the basic working principles of PN junction and Metal-Oxide-Semiconductor (MOS).
12	EEE311	전자회로 II 및 실험	Microelectronics II and Laboratory	This course is the succession of the Microelectronics I course where the material covered focused on single elements and their operational principles. In Microelectronics II, amplifiers, current mirrors, frequency response, and stability will be covered to understand the implementation of microelectronics.
13	EEE312	초고밀도집적회로설계	VLSI Design	This course studies analysis and design techniques for implementations of very large-scale integrated (VLSI) circuits, MOS technology, logic, interconnect, and memory by using electronic design aid (EDA) tools. Topics include full custom design methodology of logic gate generations, timing/power simulations, layout, DRC/LVS rule checking, and floor plan. Projects will be conducted to develop and lay out circuits.
14	EEE321	컴퓨터네트워크	Computer Networks	This course provides the fundamental concepts of computer networking and exercises for network programming. The topics covered in this course are data link, networking, transport, and application layers.

15	EEE326	영상 인식을 위한 텐서 프로세서 설계	Tensor Processor Design for Image Recognition	Today many machine learning applications require highly parallel hardware to meet the stringent performance and power requirements such as GPUs and TPUs. In this course, students will learn how to design and optimize highly parallel tensor processor through a Prototype-Oriented Learning (POL) format. This course integrates contents of multiple others courses including Digital System Design, Computer Architecture, and Hardware-Software Co-design. In addition, students will use and extend the following software and hardware to implement a prototype, which is real-time image classification running on a tensor processor: High-Level Synthesis (HLS)-based hardware design, Xilinx Pynq FPGA board, and a deep learning framework such as PyTorch.
16	EEE331	마이크로파공학	Microwave Engineering	This course is intended to introduce the general background that is required for RF, microwave, mm-wave, and THz designs. After a brief review of EM and transmission line theory, microwave network and impedance matching concepts are introduced. With the understanding of microwave network, the design of microwave components including power divider, couplers, resonators, active RF circuits, and RF systems will be covered.
17	EEE351	자동제어	Automatic Control	This course introduces fundamentals of linear systems control: mathematical modeling, analysis, and design of systems, transfer function, root locus, bode diagram, nyquist method, and state space method.
18	EEE352	디지털신호처리	Digital Signal Processing	This course introduces sampling of continuous-time signals and reconstruction of continuous signals from samples, spectral analysis of signals, fast Fourier transform, design of finite and infinite impulse response filters, signal flow graphs and filter implementation methods.
19	EEE353	최적화이론	Optimization Theory	This course introduces the fundamentals of theories and applications for optimization. This course covers optimization theory, optimization algorithms, and optimization applications such as control, machine learning, communication and image and signal processing.
20	EEE411	아날로그집적회로설계	Analog Integrated Circuits	This course covers basic concepts of fabrication, operation and design techniques related to CMOS integrated circuits. It also covers analysis and design of analog ICs using analytic techniques and CAD tools. Topics include amplifiers, current sources, output circuits, and other analog blocks.
21	EEE431	전력전자공학	Power Electronics	The objective of this course is to introduce essential elements for controling and interfacing electric power. Main topics include power rectifiers for AC-DC conversion, PFC circuits, various DC-DC converters, resonant converters, bidirectional converters, and inverters for DC-AC conversion. This course is focusing on static power conversions; however, an introduction to electromechanical energy conversion and the control and drives of electric machines will be served.