과정별 소개

■ ❑ Undergraduate Program

In the undergraduate program, various fundamental courses in electrical engineering are offered including areas in devices and electrodynamics, systems, and computer and SoC. Basic concepts in analog and digital domain are introduced from devices to systems.

The circuits and systems area is focused on the design and analysis of analog and digital circuits/systems, computer architecture, VLSI design methodologies and computer-aided IC design and software development for VLSI design automation.

The classes provided by the NDIS group cover underlying device physics, semiconductor devices, and device fabrication technology, etc. We aim at providing students a chance to learn relevant theory and principle, to experience hands-on experiments, and to apply for practical cases through taking the courses of 'Introduction to physical electronics,' 'Semiconductor devices', and 'Semiconductor IC technology'. They are useful to cultivate outstanding engineers who are good at semiconductor devices.

The EP (electromagnetics and photonics) group offers undergraduate-level introductory classes on electromagnetics and photonics for fundamental theories and their practical applications. Starting from the mandatory basic electromagnetics, students can learn the basics and applications of electromagnetics and photonics from several introductory classes, such as electromagnetic waves and antennas, radio engineering, introduction to fiber optic communication systems, and fundamentals of photonics.

The communications area is focused on signal processing, probability, digital communication, information theory & coding, and wireless communication. A wide variety of theoretical aspects both for wired and wireless communication technologies are introduced.

The computing, networking and security (CNS) group focuses on the fundamental principles in designing and implementation of modern high-performance computer systems, wireless and wired networks, bid data analytics and processing, artificial intelligence and algorithms, and recent issues in comptuer/networking security. The CNS group strives to balance the theory and practice of modern computing and networking systems, big data analytics and processing, artificial intelligence and algorithms, and comptuer/networking security, and brings various hot issues in the CNS areas into undergraduate classroom.

The signals and systems (SS) group focuses on signal processing, artificial intelligence, machine learning, control systems, multimedia, and brain information technology. The SS group provides theoretical and algorithmic foundations for studies in image/video/audio/speech signal processing, pattern recognition, intelligent signal processing, medical imaging, machine learning, control systems, and brain understanding.

❑ Graduate Program

In the graduate program, the department puts emphasis on cultivating engineers who can play the leading role in the electrical engineering field with thorough knowledge of the fundamental theories and practical capability to solve problems.

➤ Circuits and systems Group
  Analog and digital circuit design, VSLI design methodology, Design of Communication, bio/health care, and green-energy systems.

➤ Nano Devices and Integrated Systems Group
  Graduate program of NDIS group is based on learning 'Introduction to VLSI devices', 'Modern physics for Engineers', 'MEMS in EE Perspective', 'Introduction to organic devices', 'Display engineering', and 'Photovoltaic power generation'. Afterwards, those classes are extended to 'Solid state physics', 'CMOS front-end process technology', 'High frequency electronics devices', 'Monolithic microwave integrated circuits,' 'MMIC design', 'Optoelectronic semiconductor devices and their applications', 'Advanced MOS device

physics', 'Quantum engineering for nanoelectronic devices', and 'Plasma electronics'. By selection of those classes, theory and practice as well as experiment, which are customized for each track of majors, will be deepened and broadened. Through the classes devoted to special topics, recent trends and state-of-the-art technologies based on novel concepts, novel structures, new materials, and new fabrication processes will be covered.

➢ Electromagnetics and Photonics Group
 The EP group offers various graduate-level courses and research opportunities for advanced understanding and practical applications of electromagnetics and photonics areas. The first research area (Applied electromagnetics) focuses on the electromagnetics scattering, diffraction, wave propagation, including RF/ microwave and millimeter-wave circuits, antennas, packaging, system, while the second research area (Optics and Photonics) includes photonics, quantum optoelectronics, optical communication, nanoscale optical device, nanophotonics, optical sources, optical MEMS, and biophotonics.

➢ Communications Group
Engineering random processes, detection and estimation, information theory, coding theory, communication theory, convex optimization, queuing theory, linear systems, wireless communication, networking technology and applications, cellular communication systems and protocols, data communication, statistical signal processing, adaptive signal processing.

➢ Computing, Networking, and Security Group
Computer operating systems, system software, computer networks, distributed computing systems, networking algorithms and theory, smart grid systems, cloud computing, big data analysis and algorithms, artificial intelligence and algorithms, computer and networking security, electronic device security

➢ Signals and Systems Group
Image/video and audio/speech processing, 3D/AR/VR processing, pattern recognition, intelligent signal processing, artificial intelligence, machine learning, deep learning/neural networks, Brain IT, multimedia, control systems, intelligent robotic systems, factory automation, power conversion, and motor driving systems.