

□ Undergraduate Program

We provide various courses that handle issues of devices and electromagnetic theory (convergence device and system group), systems (communications and computing group), and computer and SoC (brain and smart system group). The courses help you to understand the important concepts of each field through lectures and experiments.

The field of nano device and electromagnetic theory (convergence device and system group) is in charge of teaching essential theory and implementations of nano, optical, and ultrahigh frequency devices.

The field of system (communications and computing group) is in charge of teaching signal processing, digital system, analog and digital communications, computer networking, control system, and optical communications.

The field of computer and SoC (brain and smart system group) is in charge of teaching computer architecture, programming, system LSI design, and computer software for automatic design.

We encourage students to design and implement system applications of various research areas such as analog circuits and digital systems, so that they can be outstanding individuals with the best knowledge and practical ability.

□ Masters/PhD Programs

Masters/PhD Programs gives priority to individual thesis research, which are in close relation with research interests of advisors as well as collaboration projects with other research institutes of government/private enterprises and other universities.

- ▶ Connectivity and Networked Intelligence Group : Development of information & communication network , software design for communication, networking techniques & applications, telephone network and Internet telephone network, data communication, stochastic process, signal detection theory, communication theory, mobile telecommunication system, network analysis, queuing theory, coding theory, information theory, network optimization, speech processing, image processing, communications signal processing, statistical signal processing, pattern recognition, computer vision, neural network, medical imaging system.
- ▶ Emerging Device Group : Semiconductor Device and Process, CMOS circuit design, Device simulation, Bio electronic devices, energy devices, emerging nano devices, NEMS, semiconductor laser, MMIC, OEIC, TFT, IR sensor, Antenna, Radar, optical communication network, microwave circuit design, mobile communication system receiver
- ▶ Brain and smart system group: control system design, robot intelligence & system design, industrial automation systems, power converter circuit, motor drive system, computer architecture, system modeling, system programming, AI, neural network computer, VLSI design, design optimization and development of CAD tool, brain IT.

Research Interests

Major research interests of electrical engineering fields are as follows.

□ Connectivity and Networked Intelligence (CNI) Group

The CNI group conducts research and education in the fields of communication, computing and networking. The group's main thrust is to develop theory, ideas and enabling technologies necessary to build the **future Internet (FI)**, the colossal-scale mobile flexible network that integrates wired and wireless communication networks with widely-varying characteristics, constraints and service requirements. The constituent networks include wide area networks, broadband cable networks, ultra-high-speed lightwave networks, wireless local area networks such as WiFi and WiGi, sensor networks, personal area networks and other future ad-hoc networks geared to MtoM connectivity, body-area networks and military applications. Within the vision of the FI reside smart energy networks, disaster management, intelligent transport, individually-tailored health-care

and real-time environment control. Achieving large-scale, highly dynamic and heterogeneous connectivity will also lead to maximally efficient cloud computing and storage systems with tailored service capabilities. The CNI group's research addresses all key ingredients of the future Internet: security, network infrastructure, embedded systems and storage architecture, network information theory, multi-user MIMO and interference management, channel-tailored physical layer technologies, innovative resource management, cognitive radio, cooperative communication, energy-efficient communication methods, mathematical modeling of discrete event systems and low-complexity coding and signal processing algorithms leading to competitive LSI architectures.

❑ Emerging Device Group

The Emerging Device Group investigates new devices and systems that can bring significant social and industrial impact and strives to come up with creative, innovative ideas through interdisciplinary research activities with physics, chemistry, materials science, and the biological sciences.

Its research activities include six focused field of research : Nano device and circuits, Bio electronic devices, display and lighting, green energy devices, the Lightwave and Optics, Electromagnetic Wave and RF.

Through its creative and interdisciplinary research, the group is discovering revolutionary new technologies that meet the social needs of such key future-oriented fields as information technology, energy and green environment, and bio and healthcare. Furthermore, it fosters groundbreaking, futuristic research to obtain the most cutting-edge technologies in its fields of expertise, and in the process produces elite minds capable of competing at the topmost levels around the world.

❑ Brain and smart system group

Brain and smart system group has research interests on signal and information processing algorithms and application systems design and implementation. The field can be divided into information system, control system, SoC design, and brain IT. Information system handles information and signal processing related to voice, image, and communications, such as voice synthesis and coding, signal processing and prediction, computer vision, pattern recognition, multimedia communications, digital mobile communications, information protection, signal detection and prediction, and 3D image processing. Control system handles control theory which is essential in various intelligent systems and industrial systems, as well as robots and electric power. This research field targets intelligent environment in the future through process control system, automatic assembly lines, satellite system, intelligent traffic control system, power converting system, LCD and LED digital display system, human centered welfare robots, personal robots, artificial organisms, mutual cooperation among robots, human-robot interface, and emotional robots. SoC design field handles embedded processors, digital and analog circuit design, hybrid circuit design, platform based design, automatic design and theory for optimization and verification, and sensor network. This research field gives priority to basic research and core technology development of wireless mobile communications, digital TV, displays and ubiquitous network of next generation which requires high performance with low energy consuming.