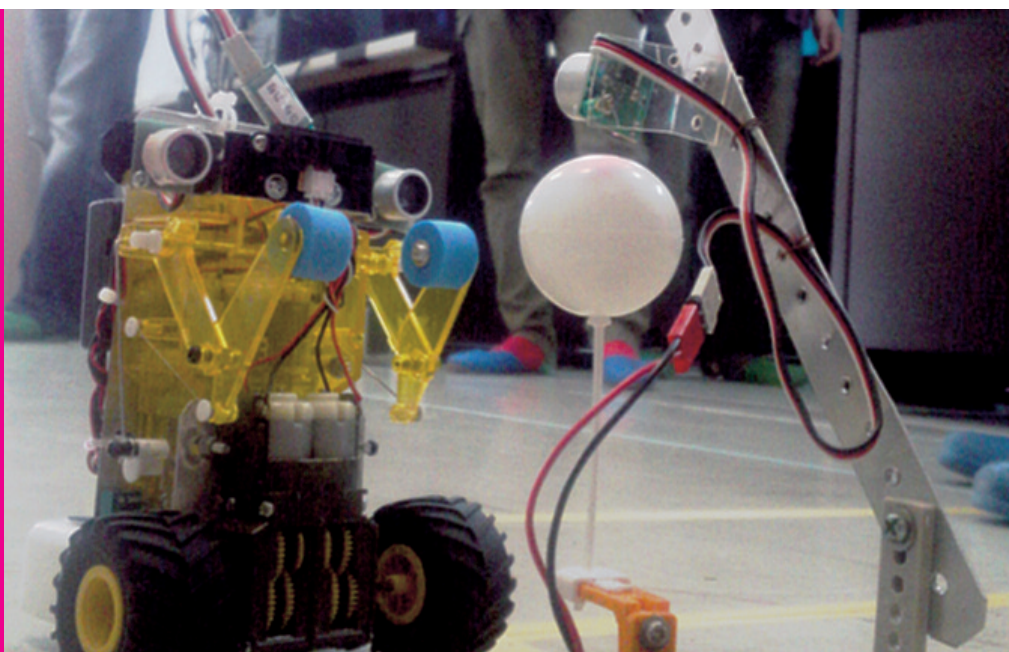


2012



Bulletin

Faculty of Engineering
Graduate School of Engineering and Science



About us

Universities are different from other educational organizations in that they carry out research activities. Universities provide education to the extent which humans possess such knowledge, and beyond such limits, universities engage in research. Research requires academic freedom, which is also known as the freedom of thought. Therefore, it is of utmost importance that you think freely and act of your own volition.

In engineering, all man-made objects in our surroundings may become subjects for research. As such, it is my opinion that the Japanese word for engineering, “kougaku,” is an abbreviation of the word “jinkoukagaku,” which means artificial systems science in English. This serves as a binary term for the concept of natural sciences. Engineering seeks to continually surpass the limits of human knowledge by carefully researching man-made objects through scientific methodology.

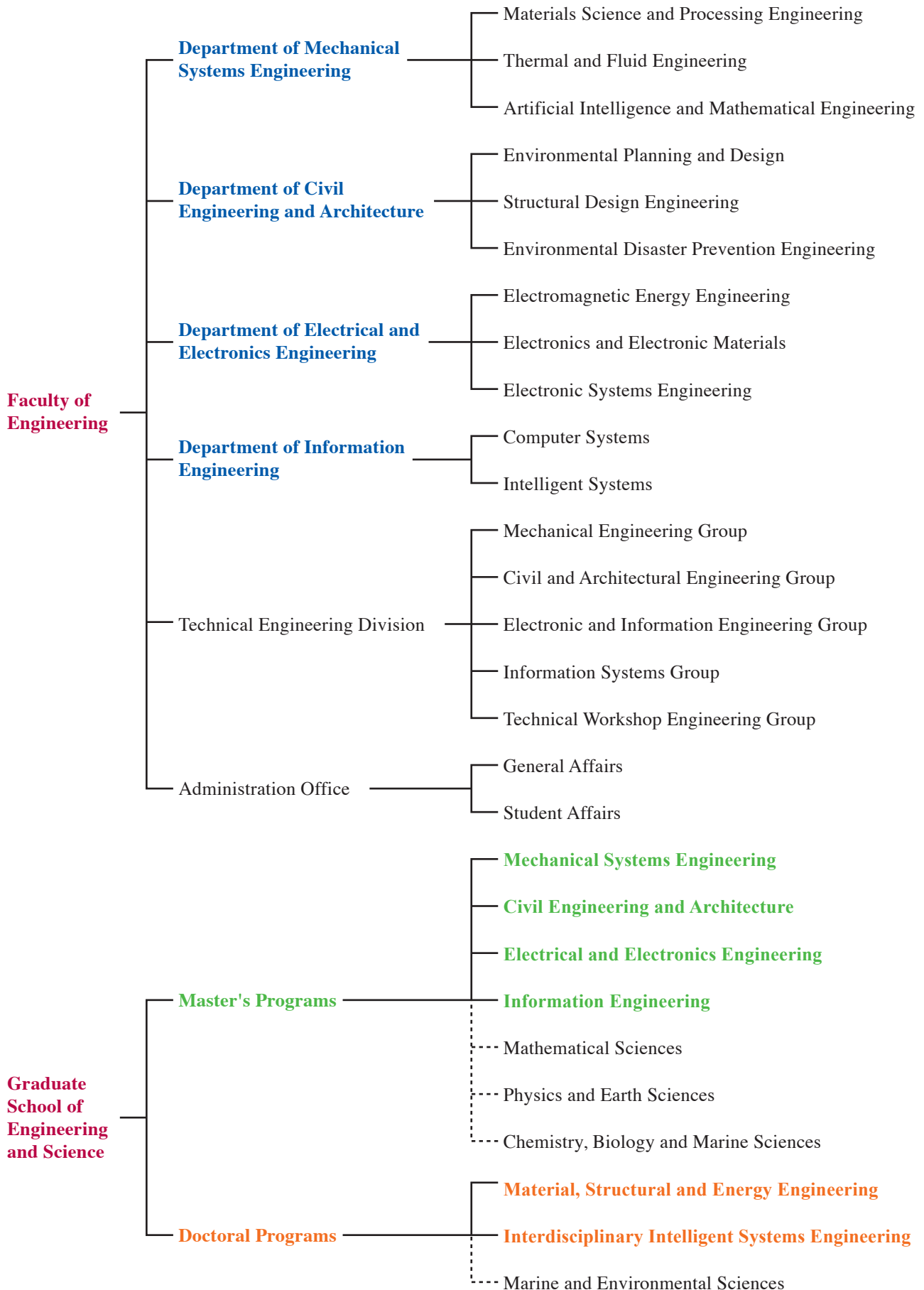
The Faculty of Engineering at University of the Ryukyus is organized into the departments of Mechanical Systems Engineering, Civil Engineering & Architecture, Electrical & Electronics Engineering, and Information Engineering. Through its world-class education in each field, the Faculty nurtures individuals who possess cultural refinement, the ethics of technical experts, as well as a high level of technical knowledge, who are able to contribute to society and the conservation of the local environment, and are creative and possess the power of execution.

In order to maintain a world-class education, organizations need to carry out high-level research. The engineering divisions of the Graduate School of Science & Technology research beyond the limit of human knowledge in the engineering field by organizing doctoral programs which involve the majors of Material, Structural & Energy Engineering and Interdisciplinary Intelligent Systems Engineering, and master’s programs which involve the majors of Mechanical Systems Engineering, Civil Engineering & Architecture, Electrical & Electronics Engineering, and Information Engineering. The Graduate School has a special program using English as the official language. This program is for scholarship or non-scholarship international students who come mainly from developing countries in the Asia-Pacific region.



Dean Tomio TAKARA

Organization



Department of Mechanical Systems Engineering

Mechanical Engineering forms the base for all branches of engineering. It includes the studies of imaging, manufacturing, and controlling of all types of machinery and instruments in our society and huge industrial machinery such as space exploration vehicles, as well as estimating the effects of machinery on the environment. The Mechanical Engineering Department consists of three divisions, which are Materials Science & Processing Engineering, Thermal & Fluid Engineering, and Artificial Intelligence & Mathematical Engineering. In addition to these divisions, there are studies on production systems and computer aided ones.

The undergraduate education program, which is fully accredited by JABEE (Japan Accreditation Board for Engineering Education), provides our students with international standard education level trials in mechanical engineering.

While freshmen take general education, engineering mathematics, and mechanics courses, second or third year students will take courses in their respective major in a well-branched curriculum in the three divisions. From these courses, the students will acquire a well-rounded knowledge necessary for an engineer or researcher. In their senior year, students will start working on their graduation theses. They will then learn study methods and acquire an engineering sense.



Personal Computer Software Practice



Experimental Test for Material Strength



Curriculum of Engineering Design



**3kW horizontal wind turbine generator
with three variable pitch blades**

Department of Civil Engineering and Architecture

The Department of Civil Engineering and Architecture aims to develop high-level human resources with extensive knowledge and skills in the civil and architectural engineering fields for sustainable development and conservation of the global environment.

The Department consists of three research divisions and two educational courses. The three research divisions are Environmental Planning and Design, Structural Design Engineering and Environmental Disaster Prevention Engineering. The two educational courses are Civil Engineering and Architecture. The students of the Department attend one of the two courses. The students of both courses mainly learn liberal arts in the freshmen year and special subjects set out for their respective courses in the sophomore year.

Civil Engineering Course

The Civil Engineering Course of the Department obtained certification and educational recognition through the Japan Accreditation Board for Engineering Education (JABEE) Quality System and offers education programs at the international education level. Students who have completed the education program are exempt from the first-stage professional engineer examination.

Five research fields are provided: infrastructure planning, structural engineering, concrete materials, coastal engineering, and geotechnical engineering. In the senior year, each student has to become a member of one of the supervisors' study group and get involved in research work for their theses regarding the research field of their supervisor.



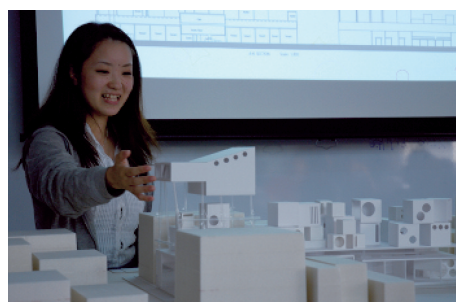
On-Site Inspection



Concrete Technology Class

Architecture Course

The Architecture Course provides a holistic education program of not only architecture but also building sciences in four years, which is the typical system in Japan. The graduates then acquire the qualification to take the architect license examination. This course consists of six research fields: Architectural Planning and Design, Urban and Regional Planning, Urban and Architectural Environmental Engineering, Building Structural Engineering, Building Material Engineering, and Disaster Prevention Engineering. The students study these special subjects from the first year in addition to liberal arts. They are required to complete their graduate theses under the supervision of teaching staff in the final year.



Architectural Design Assignment

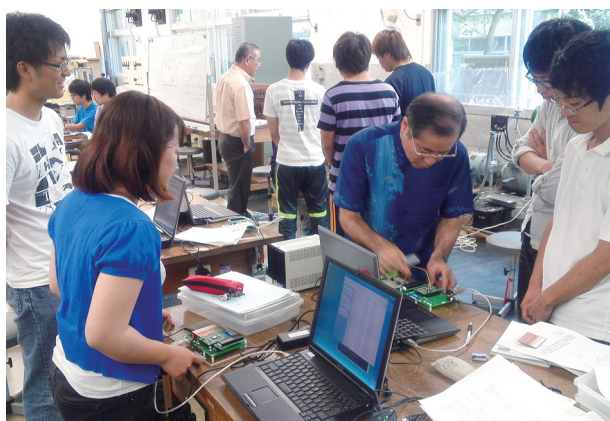


Seismic Strengthening Test

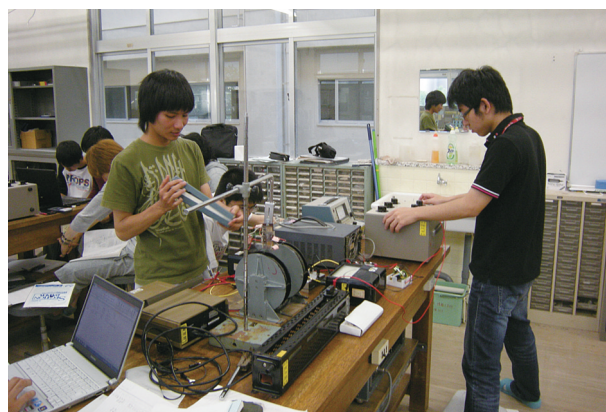
Department of Electrical and Electronics Engineering

Technologies in the electrical and electronics engineering fields form the infrastructure of information and communication technology, which supports all aspects of human activities. The technologies are also an engine of economic growth, and innovative research and human resources development in this field are always required. Because of these social demands, the Department of Electrical and Electronics Engineering focuses on education for the development of expert engineers who are active internationally and possess flexible minds and broader viewpoints.

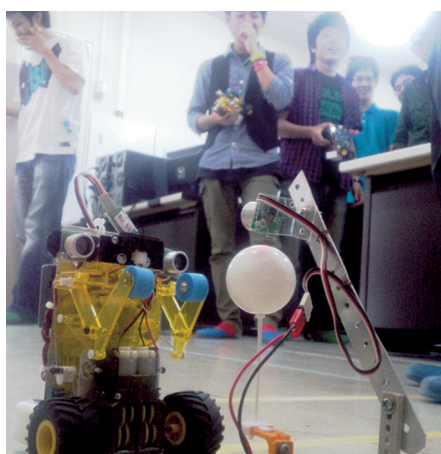
The educational program of this department has been accredited by the Japan Accreditation Board for Engineering Education (JABEE) in the fields of electrical, electronics, and communications engineering since 2006. In this program, general and foundational education and specialized education are well-organized and balanced so that students can acquire a broad perspective and flexible thinking. The department emphasizes practical learning through laboratory experiments, problem-solving researches, and computer programming to obtain an ability to provide solutions for actual problems. The Department also offers scheduling evening course for students who work during the daytime.



Sequential Control Experiment



Hall Effect Experiment



Robot Experiment



Lecture

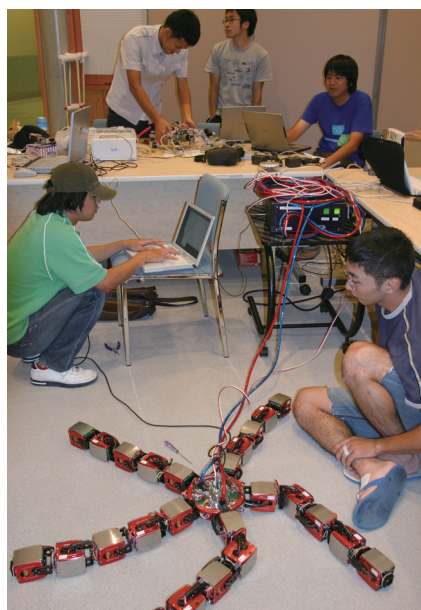
Department of Information Engineering

In the Information age, computer technology plays an important role in every field of our society. Information Technologies related industries are promoted as leading technology of Okinawa in 21st century.

Our department contains computer systems and intelligent systems, where students can study a unique combination of practical systems and complex intelligence. There are six educational courses: Computer System Engineering, Information and Communication, Software Engineering, Intelligent Information Processing, Artificial Intelligence, and Intelligent Control.

During special courses studies, students develop their own activities and creativity. Specifically, each freshman can use their own personal computer to study the practical usage of computers. Sophomore students attend seminars with working professionals. Most of the seminars are comprised of discussions and writing, and all provide opportunities for individual expression and intellectual exploration. In the third year, students carry out one year projects to implement real VLSI design, robotics, multi-media entertainment and signal information processing products. The fourth year students join various research projects such as communication systems, signal processing, artificial intelligence, intelligent robotics, software engineering, and high performance computing. We also provide general culture courses during the four years of education to develop knowledge in more general areas.

For more information, please visit '<http://www.ie.u-ryukyu.ac.jp/>'.



Multipod Robot



Information Engineering Experiments

Master's Program (Engineering Division)

Mechanical Systems Engineering Course

The Mechanical Systems Engineering Course consists of three divisions: Design, Analysis and Processing of Engineering Materials, Thermal and Fluid Engineering, and Artificial Intelligence and Mathematical Engineering. The course trains students to become professional engineers and researchers with advanced knowledge and techniques in the fields of materials, energy, dynamics, control, and processing.



Stabilization of carbon dioxide and the development of a new energy source through the use of marine biomass



Atmospheric corrosion test for several metals

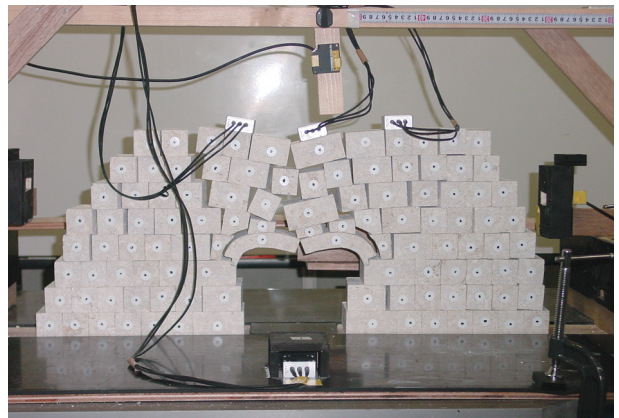
Master's Program

Civil Engineering and Architecture Course

The Civil Engineering and Architecture Course consists of three divisions: Environmental Planning and Design, Structural Design Engineering, and Environmental Disaster Prevention Engineering. The aim of this course is to train the students to be professional engineers and researchers who work as expert scientists and engineers for sustainable development of the earth. The students are required to consider the everlasting relationship between human beings and nature, which means the peaceful coexistence of both and the prevention of natural disasters.



Ultimate shearing test of stainless steel plate girders

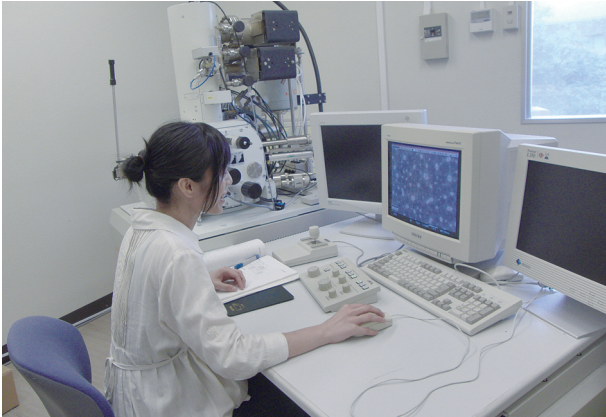


An experiment on the seismic response of stone masonry arch structures using a shaking table

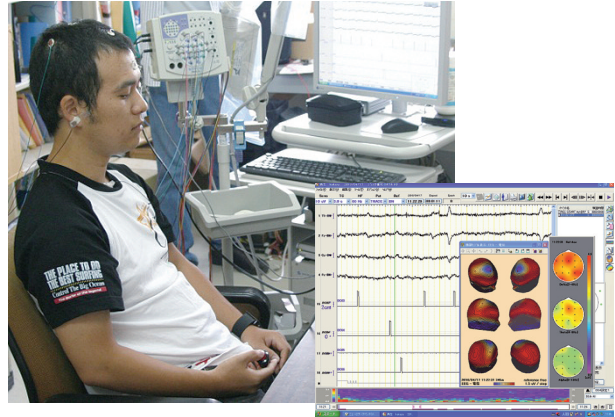
Master's Program (Engineering Division)

Electrical and Electronics Engineering Course

The Electrical and Electronics Engineering Course is made of three divisions: Electromagnetic Energy Engineering, Electronic Materials Engineering, and Electronic Systems Engineering, where students and young professional engineers are provided with advanced knowledge and up to date techniques in those fields.



Semiconductor Devices Laboratory

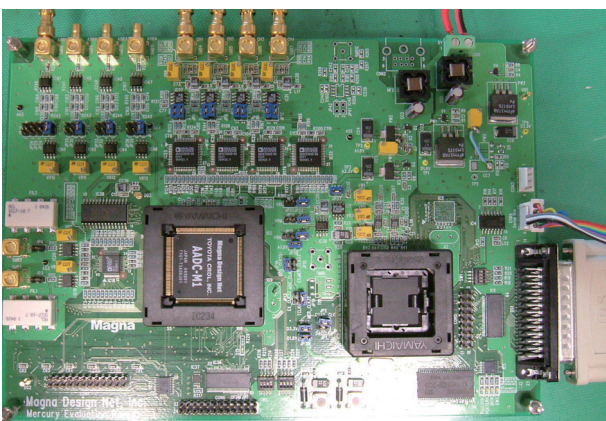


Biomedical Engineering Laboratory

Master's Program (Engineering Division)

Information Engineering Course

The Information Engineering Course has two divisions: Computer Systems and Intelligent Systems. The studies in each range from hardware to software. Students can develop their talents of research and development to adapt to a technological society which consists of human intelligence, computers, communication networks, and media.



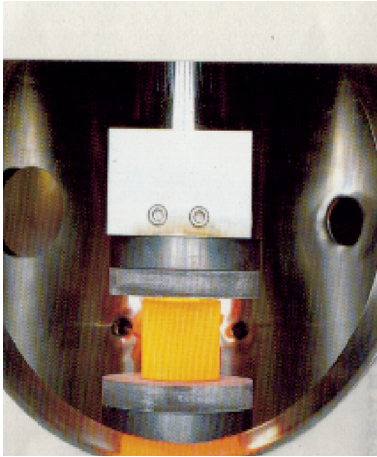
Terrestrial Mobile TV Receiver Demo System



VLSI Design CAD System

Material, Structural and Energy Engineering

This course consists of two divisions: Processing Development Engineering and Energy Development Engineering. Education and research in the Divisions are in the fields of intelligent materials, design and processing, thermal and fluid transfer, energy conversion, seismic performance and durability, and ocean development.



Sintering Process



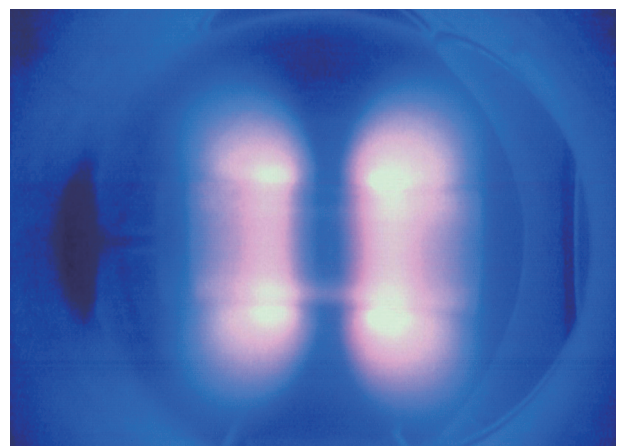
Manufacturing of functionally graded materials by spark plasma sintering

Interdisciplinary Intelligent Systems Engineering

Two divisions of this course, Environmental and Information Engineering and Electronics and Information Engineering, offer education and research in the fields of urban environmental design, intelligent design and planning technology for the living environment, intelligent systems engineering, electric and electronic systems, intelligent robotics, and control and information engineering.



A SEM photograph of SOI DRAM cell capacitors



Luminescence from ECR plasma of N₂ gas around permanent magnets

The description of the Science Division of the Program is omitted.

Technical Engineering Division

About us

The new system of the Technical Engineering Division was established in April of 2008. It is the fourth year.

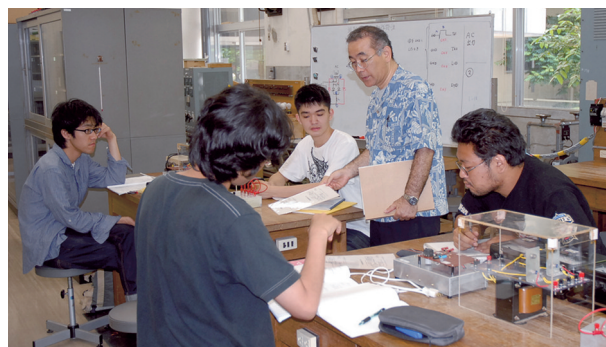
It consists of five groups, Mechanical Engineering Group, Civil and Architecture Group, Electronic Engineering Group, Information System Group and Technical Workshop Engineering Group. The Mechanical Engineering Group supports analyses of the processing of metal materials, fluid experiments, experiments of internal-combustion engine, and experiments of information engineering. The Civil and Architecture Engineering Group supports analyses of soil, earthquake-resistance experiments, surveying practices, and experiments of information engineering. The Electronic Engineering Group supports electrical experiments, developments of robots, device control by computers. Information System Group is primarily involved in the Support Services Department of Information Engineering. Supporting the experiment of Information Engineering, Server administration, Programming. In addition, Project-based learning, and project management we also lecture. The Technical Workshop Engineering Group makes machine tools to support MONOZUKURI (manufacturing).

For the faculty and all the departments' administrations, we assist the open campus event, entrance and graduation ceremonies, and office work of all the departments. We successfully continue to participate in department meetings as we did even before the establishment of new system.

Other than these five groups, there are education support team, public relation team, management and evaluation team, and training project team that the Technical Engineering Division organizes in order to support education and research activities as smoothly as possible by cooperating with each other.



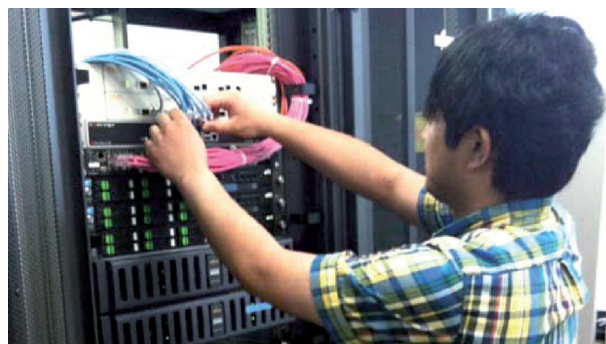
Practice of lathe



Electronic and electric power system experiment



Setting of earthquake-resistance test



Practice of assembly

Special Graduate Programs for International Students

The Graduate School of Engineering and Science offers the following special graduate programs for international students:

[Master's program]	
Majors	Mechanical Systems Engineering, Civil Engineering and Architecture, Electrical and Electronic Engineering, Information Engineering
[Doctoral program]	
Majors	Materials, Structural and Energy Engineering, Interdisciplinary Intelligent Systems Engineering

These special programs have been organized in order to offer better opportunities for graduate study to students from abroad by conducting all courses and research in English, and commencing academic programs in April and October.

International Students by Nationality

As of May 2012

Countries	Undergraduate		Graduate		Research and Auditor Student		Total	
	Japanese Gov. Scholarship	Private	Japanese Gov. Scholarship	Private	Japanese Gov. Scholarship	Private	Japanese Gov. Scholarship	Private
Bangladesh			4	1			4	1
Bhutan			1				1	
China	1 (1)	16(2)		11(2)	1 (1)		2 (2)	27 (4)
Taiwan		1 (1)	1					1 (1)
Korea		1		1	1		1	2
Sri Lanka		1						1
Fiji			1 (1)	1			1 (1)	1
Indonesia				3				3
India			1				1	
Malaysia		1						1
U.S.A.			1				1	
Myanmar						1 (1)		1 (1)
Algeria			1				1	
Argentina			1				1	
Tanzania			2				2	
Thailand			1				1	
Vietnam			1	2			1	2
Total	1 (1)	20(3)	14(1)	19(2)	2(1)	1 (1)	17(4)	42(4)

*() refers to the number of female students.

Number of Staff Members

As of September 2012

	Professors	Associate Prof.	Assistant Prof.	Instructors	Research Assistants	Researcher	Sub Total	Adm.Staff	Total
Department of Mechanical Systems Engineering	11	12		8			31	9	40
Department of Civil Engineering and Architecture	8	8		5			21	5	26
Department of Electrical and Electronics Engineering	9	10		6			25	6	31
Department of Information Engineering	7	4	1	5			17	3	20
Total	35	34	1	24			94	23	117

University and Faculty Level Exchange

As of September 2012

Name of University	Country/Area	Date Of Signing	Purpose of Agreement		Note
			Academic exchange	Student Exchange	
University of Tehran	Iran	10.26.1998	○	○	
Fuzhou University	China	3.1.1999	○	○	
University of Sao Paulo	Brazil	3.29.2000	○	○	
Hanoi University of Technology	Vietnam	12.5.2007	○	○	
King Mongkut's Institute of Technology Ladkrabang	Thailand	3.28.2008	○	○	
National Taiwan University of Science and Technology	Taiwan	9.15.2008	○	○	
Hoseo University	Korea	9.4.2009	○	○	
Chunbuk National University	Korea	6.10.2010	○	○	
Dalian Polytechnic University	China	11.30.2010	○	○	
Sungkyunkwan University	Korea	2.14.2011	○	○	

University of the Ryukyus, Nishihara, Okinawa 903-0213, Japan
<http://www.tec.u-ryukyu.ac.jp>

