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GRADUATE SCHOOL OF SCIENCE AND ENGINEERING KAGOSHIMA UNIVERSITY SEARCH

INQUIRY

Kagoshima University Graduate School of Science and Engineering

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GRADUATE SCHOOL OF SCIENCE AND ENGINEERING

KAGOSHIMA UNIVERSITY

Master's Program

Mechanical Engineering

Electrical and Electronics Engineering

Architecture and Architectural Engineering

Chemistry, Biotechnology, and Chemical Engineering

Ocean Civil Engineering

Information Science and Biomedical Engineering

Mathematics and Computer Science

Physics and Astronomy

Chemistry and BioScience

Earth and Environmental Sciences

Doctoral Program

Interdisciplinary Department of
Science and Engineeing

Contents

University Calendar

■ **Terms**
First Semester ●4/1to9/30
Second Semester ●10/1to3/31

■ **Matriculation Ceremony** ●Early April
※Matriculation Ceremony in October 10/1

■ **Vacations**
Spring Vacation ●Early April
Summer Vacation ●8/1to9/30
Winter Vacation ●From late December to early January

■ **Conferment Ceremony** ●From late March
※Conferment ceremony in September

Organization

① Department → ② Master's Courses → ③ Doctoral Courses

Faculty of Engineering

Department	Master's Courses
Mechanical Engineering	Mechanical Engineering
Electrical and Electronics Engineering	Electrical and Electronics Engineering
Architecture and Architectural Engineering	Architecture and Architectural Engineering
Chemical Engineering / Chemistry and Biotechnology	Chemistry, Biotechnology, and Chemical Engineering
Ocean Civil Engineering	Ocean Civil Engineering
Information Science and Biomedical Engineering	Information Science and Biomedical Engineering

Faculty of Science

Department	Master's Courses
Mathematics and Computer Science	Mathematics and Computer Science
Physics	Physics and Astronomy
Chemistry and BioScience	Chemistry and BioScience
Earth and Environmental Science	Earth and Environmental Science

Graduate School of Science and Engineering

- Interdisciplinary Department of Science and Engineeing

University education and research facility

- Nansei-Toko Observatory for Earthquakes and Volcanoes
- Regional Value Creation Center

Message from the Dean

With its roots in the Science Department of the 7th High School of Japan, established in 1901, the Faculty of Science Graduate School was established in 1977 to provide higher education for university graduates, in response to the needs of society.

Originating in the Faculty of Engineering at Kagoshima Prefectural Industrial College, established in 1945, the Graduate School of Engineering opened its first masters' course in 1968 in response to the country's need for highly skilled engineers. A doctoral program was added in 1994 to build on these foundations, and to foster leaders in technology education and research.

In 1998 the two programs were combined to form the Kagoshima University Graduate School of Science and Engineering, to allow students to build a strong foundation in scientific research, from which to progress to original, creative research in science and technology.

Kagoshima University Graduate School of Science and Engineering offers 10 specializations and employs approximately 200 faculty and teaching staff engaged in fundamental and applied research in a wide variety of fields, and who are responsible for both undergraduate and graduate education. At least half of all students graduating from the undergraduate Faculty of Science and the Faculty of Engineering go on to higher education, and there are about 80 students enrolled in the three comprehensive doctoral programs.

The physical sciences concern themselves with the study of seismic and volcanic activity in our country, measuring and predicting earthquakes and volcanic eruptions in affiliation with the Nansei-Toko Observatory for Earthquakes and Volcanoes. This chain of islands is a key area of study as it includes one of the world's most active volcanoes, Mt. Sakurajima, the World Heritage Site Yakushima, and supports a wide array of biodiversity. Working with the National Astronomical Observatory of Japan, our school is also involved in galaxy mapping through the VERA Project.

Our engineers are involved in meeting the region's environmental, energy, and medical needs, as well as in the prevention and mitigation of natural disasters, including volcanic eruptions, typhoons, heavy rain and flooding, earthquakes, and tsunami. Because these issues strongly impact Southern Kyushu and the Nansei Islands, it is essential to investigate the challenges presented.

Through all these ventures, the Graduate School of Science and Engineering cooperates with a wide variety of overseas research institutions.

As the technical capabilities of developing countries increase and international competition becomes more intense, there are high expectations for our doctoral graduates to be innovators who can contribute their expertise to the betterment of society. To meet these expectations, Kagoshima University Graduate School of Science and Engineering established a Regional Development Center in April 2015. And from April 2016 we will revise the educational structure and curriculum with the aim of establishing a progressive course in Science and Technology that will cultivate innovative researchers who can contribute not only to the security of the local region, but also to the development of the country as a whole.

Eiji Kondo, Dean, Graduate School of Science and Engineering, Kagoshima University

Post-Graduate Program Outline

The Graduate School of Science and Engineering builds on this country's achievements in science and technology and forms the core of Kagoshima University's postgraduate education. As such, we offer two programs: The Master's Program gives students a more specialized education than the one they received during undergraduate study. The Doctoral Program offers cutting-edge, interdisciplinary, and comprehensive education and research opportunities that encourages innovation. We push the boundaries of engineering and science, fusing the two branches together to develop human resources who can compete with their counterparts anywhere in the world and form the foundation of this country's competitive advantage.
In other words, we nurture capable people with basic proficiency in natural science and engineering who can apply their capabilities in a wide range of fields at the same time. Professionals, who understand the necessity of scientific creation, will act proactively, see things from a long-term and comprehensive point of view, and professionals who will put theory into practice

Educational Objective

The philosophy of the Graduate School of Science and Engineering is to develop truth-loving, highly ethical, self-motivated individuals who can meet challenges and contribute to the development of the regional and international community through the creation of an education and research system and framework that responds to the demands of the times. In order to live up to this philosophy, we have set ourselves the objective of developing capable people who study and teach the most recent academic theories and findings in the fields of science and engineering. From foundational to practical application, we delve deeply into scientific inquiry and contribute to the development of human civilization. In order to achieve this objective, one further objective is necessary: To cultivate engineers, researchers, and highly specialized, next-generation professionals who possess the sound ethical judgment necessary to confront contemporary issues, who have comprehensive knowledge about the environment, and who can respond extensively and flexibly to the advancement and diversification of natural science.

Research Objective

Based on our educational philosophy, our objective is to engage ourselves in research whose outcome helps us respond widely and flexibly to the advancement and diversification in the science and engineering fields, ushers in next-generation technology, provides us with advanced and comprehensive knowledge about the nature around us, and nurtures moral standards in students'minds so that they can cope effectively with contemporary issues.
As an educational institution, we train engineers who possess an international point of view and can create new technology that supports a wide range of natural science. Thus, we have the responsibility to conduct research and education in ways that will instill broader outlooks and problem-solving capabilities in students and to engage ourselves in the kinds of research activities that contribute to the development of technology. The following are descriptions of research activities the Graduate School of Science and Engineering puts into practice in accordance with our educational objectives.

- Research to produce scientific and technological benefits that make the world a happier and better place for mankind.
- Advanced research in order to use science and technology to support a knowledge-based society in many different ways.
- Research to develop understanding about the necessity of scientific creation in natural science and to contribute to the solution of problems arising from a rapidly changing society.
- Research conducted with high moral standards that allow the local community, the international community, and the nature around us to coexist and prosper together.

Admission Policy

◎Master's Courses

①Qualities

A)Those who share the philosophy of the Graduate School of Science and Engineering and possess the enthusiasm to put that philosophy into practice, those who have basic scholastic ability, those who think in a scientific and rational manner, and those who can communicate effectively.
B)Those who possess an intensely inquiring mind, are keenly interested in science and engineering issues, and will spare no effort in overcoming challenges.
C)Those who are intent on acquiring the skills needed to plan a multifaceted scientific observation program and to conduct logical analysis with results to analyze a wide variety of phenomena in the science and engineering fields.
D)Those who have the desire to apply the specialized knowledge acquired here for the betterment of the local and the international communities, who embrace diverse cultures and values, and those who possess high moral standards.

②Prerequisite Knowledge

The successful candidate will have expert knowledge/skills in his/her science or engineering specialty and a good knowledge of and/or fluency in English or another foreign language.

③Selection Process [General Selection]

Oral Examination: In addition to an interview, which includes an oral examination, the criteria include school records and statement of purpose.It is also important that the candidate has sufficient knowledge/skills in their specialization and the aptitude/motivation necessary to become the kind of researcher who can meet our Educational Objective.

Written Examination: The candidate must also take a written examination in their specialization [the questions are from the candidate's specialization in science or engineering] and English as these are necessary criteris for the candidate to meet the Educational Objective.The candidate also has to be interviewed. Other criteria include school records, the level of knowledge/skills in his/her specialization, reading comprehension [English] and aptitude/motivation.

◎Doctoral Course

①Qualities

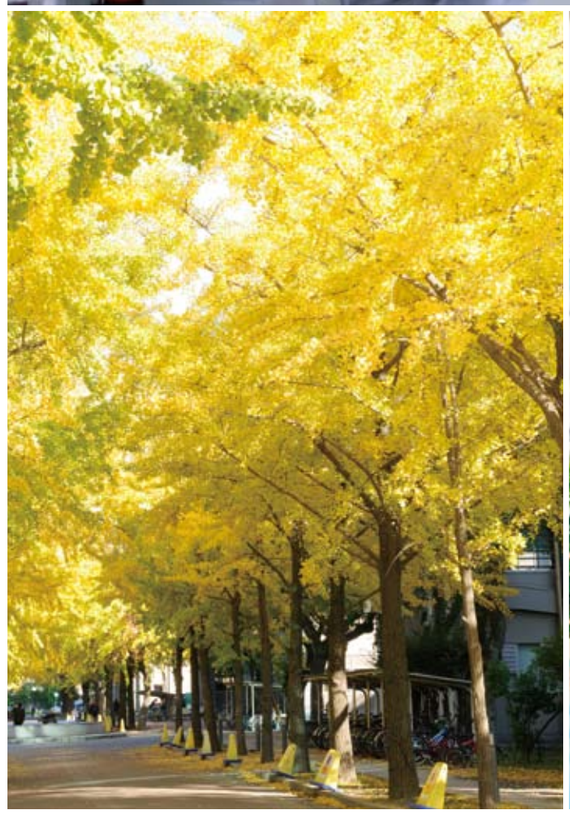
The candidate
A)shares the principle of the Graduate School of Science and Engineering, has the basic ability and motivation to realize it, thinks logically and rationally, and has good communicative skills.
B)is deeply interested in different issues in science and engineering, sparing no effort in grappling with a variety of problems who has a strong inquiring spirit.
C)is willing to sharpen their skills, formulating scientific and multi-dimensional execution plans and analyzing their results logically in order to clarify different phenomena in science and engineering.
D)appreciates the different values and cultures of the world, has high ethical standards and is keen to use the expertise acquired at the Graduate School of Science and Engineering to make contributions to local and global communities.
E)is willing to become a scholar or highly qualified professional in science or engineering and is eager to take on the responsibilities of leadership.

②Prerequisite Knowledge

The successful candidate will have advanced expert knowledge/skills in science and engineering, and advanced knowledge/fluency in a foreign language [English].

③Selection Process [General Selection]

The selection criteria include the results of an oral examination, school records, master's thesis and research proposal, and advanced knowledge/skills and aptitude/motivation in the specialization. These skills are necessary for the candidate to become the kind of researcher who can meet the Educational Objective.



Master's Program Outline

Mechanical Engineering

The Department of Mechanical Engineering provides education and research programs in the fields of: Properties and strength of materials, structural design, equipment design and control, manufacturing engineering, various phenomena related to heat and fluids, energy utilization technology, clarification of various engineering phenomena, computer utilization technology in mechanical design, and various system construction techniques.
In this department, we aim to develop engineers who can proactively apply the knowledge necessary for pursuing the advancement of the mechanical engineering field using undergraduate studies in mechanical engineering as a basis. A wide range of education and research in the fields listed above is conducted in three different courses.

01.Educational Objective

Students in the Department of Mechanical Engineering are engaged in learning and research about the physical properties of materials and equipment. This includes, but is not limited to, studies about material structure and strength, machine design and control, production and processing methods, the behavior of heat and fluids, the utilization and conservation of energy in technical applications, digital methods of device control, and mechanical system design. Graduate students in this field will build on the skills and knowledge gained in their undergraduate studies, with the aim of advancing the field of mechanical engineering.

02.Admission Policy

①Qualities

The Department of Mechanical Engineering seeks students with a strong foundation in the following areas:

a)Engineers who are passionate about the long-term impact of their research and the betterment of society.

b)Highly motivated individuals with the capability to pursue an inquiry into the true nature of various mechanical engineering problems with the aim of developing sustainable, ethical solutions.

c)People who are capable of communicating effectively with other individuals, and of working cooperatively in teams to design, develop, and promote proposals and solutions to mechanical problems.

②Prerequisite Knowledge

Prior to entrance, the prospective student ought to possess a strong foundation in the knowledge and practices of Mechanical Engineering, and the ability to use a foreign language (priority given to English) to further their professional knowledge.

③Selection Process (General Selection)

The candidate's eligibility will be evaluated based on their undergraduate transcript, an application essay, both oral and written exams, and an interview. In addition to passing the required tests, prospective students must demonstrate their knowledge of Mechanical Engineering, their educational goals, their foreign language skills (priority given to English), as well as their undergraduate performance in courses related to mechanical engineering, and in foreign language courses (priority given to English). In addition the candidate must demonstrate their commitment to their personal and professional development.

Professional Skills Development

- ◎Those who possess highly advanced specialized knowledge which enables the pursuit of world-leading mechanical engineering technology.
- ◎Those who can proactively contribute to the community through industrial work related to manufacturing.
- ◎Those who, equipped with the ability to find solutions to problems as well as the ability to make sound ethical judgments, will play enterprising and leading roles in the world.

Course Work

Production Engineering Course

Education and research fields: Damage Evaluation of High-Temperature Materials, Life Expectancy Prediction, 3D and 4D Material Histology, Metals Development, Ceramics Development and Composite Materials Development, Tribology in metal forming process, Phase Equilibria, Phase Diagrams, and Phase Transformation.

Energy Engineering Course

Education and research fields: Flow Phenomena of Gas-Liquid Two-Phase Flow in Microchannels and Minichannels, Development of Environmental Conservation Apparatus using Fluid Forces, Diesel Engine Combustion of Various Biofuels, Analysis of Supersonic Flow in Industrial Equipment, Thermal Analysis of Nano-Satellites, Investigation of Gas Flow Flowing in Microchannels and Heat Transfer Characteristics as well as their Industrial Application.

Mechanical System Engineering Course

Education and research fields: Manufacturing and Evaluation of Functionally Graded Materials, Intelligent Manufacturing System, Investigation of Self-excited Vibration Generation Mechanisms and their Prevention and Utilization, Intelligent Robotics, Smart Rehabilitation System, Instrument and Control Engineering, Control of Mechanical System and Micro-Nano biomechanics.

Curriculum

In addition to the required "Mechanical Engineering Seminar," we also provide basic and comprehensive "Advanced Courses in Mechanical Engineering" so that students can gain a comprehensive understanding of the entirety of the coursework. Required and elective courses are classified into: the Production Engineering Course, the Energy Engineering Course, and the Mechanical System Engineering Course. Students are required to obtain more than 6 credits from each course.

Upon matriculation, students create a study program after consultation with their academic advisors, and then decide which classes to take from required and elective classes. Students take these classes in order to become engineers with appropriate ethical values.

Master's Program Outline

Electrical and Electronics Engineering

Scientific technology in an advanced information-oriented society is characterized by the evolution and systemization of cutting-edge technologies such as new materials, VLSI, computers, etc. In particular, electronic device engineering for the development of new materials and devices based on new concepts, electrical power engineering for new electrical energy sources and the systematic utilization of electrical energy, and communication systems engineering for the systemization of communication, information, and computer technologies, are all basic technologies that are utilized everywhere in the modern world and form the foundation of an information-based society.
In response to the modern organization of electrical and electronics engineering, our department is divided into three courses for education and research purposes: Electronic Device Engineering, Electrical Power Engineering, and Communication Systems Engineering. Our goal is to develop human resources who are qualified to take central and leading roles in the state-of-the-art electrical and electronics engineering fields along with related interdisciplinary areas. Our post-graduate education fosters highly-specialized experts and researchers with a deep understanding of their respective fields, who can see the entire body of scientific technology from a broad point of view, and possess the ability to think outside the box.

01.Educational Objective

In the Department of Electrical and Electronics Engineering, we aim to train creative and specialized professionals who can pursue world-leading technology, possess specialized knowledge, have the ability to make sound ethical judgments, and will take leadership roles in an industry that leads an advanced information-oriented society.

02.Admission Policy

①Qualities

The Department of Electrical and Electronics Engineering seeks students who have a high level of competence in their area of research supported by a strong academic foundation, with understanding of our educational objectives for the following well-developed engineers:

a)Those with broad outlooks who can make full use of their high-level of expertise to respond swiftly and flexibly to the diverse and dynamically changing social needs.

b)Those who have the creative capacity to develop new technologies and solve problems related to electrical and electronics engineering.

c)Those who are highly-motivated to lead an advanced information-oriented society and those who are committed to contributing to local and global communities.

②Prerequisite Knowledge

Prior to entrance, the prospective student ought to possess a strong foundation in the knowledge and practices of electrical and electronics engineering, and the ability to use a foreign language (priority given to English) to further their professional knowledge.

③Selection Process (General Selection)

The candidate's eligibility will be evaluated through either oral or written examination. In the oral examination candidates will be assessed based on their undergraduate transcript, an application essay, English skills, and an oral test. As for the written examination, we will examine candidates on the specialized subjects (Applied Mathematics, Electromagnetism, and Theory of Electric Circuit) in addition to evaluating their undergraduate transcript, English skills, and an interview. The candidates must demonstrate their knowledge and competence concerning electrical and electronics engineering, required for achieving our educational goals, as well as their commitment to their personal and professional development.

Professional Skills Development

- ◎Those with broad outlooks who can make full use of their high-level of expertise to respond swiftly and flexibly to the diverse and dynamically changing social needs.
- ◎Those who have the creative capacity to develop new technologies and solve problems related to electrical and electronics engineering.
- ◎Those who are highly-motivated to lead an advanced information-oriented society and those who are committed to contributing to local and global communities.

Course Work

Electronic Device Engineering Course

An advanced information-oriented society is grounded in a large variety of electronic devices. While conducting research into the operating principles of electronic devices, this course also researches the design of essential materials needed for high-performance electronic devices, manufacturing processes, etc. Research and education focuses mainly on the manufacturing process of devices using high-temperature superconducting oxide thin films, transparent conductive films for displays, photo-rechargeable batteries, physical properties evaluation using photo-electron spectroscopy, the plasma process, laser evaporation, and vapor-phase growth.

Electrical Power Engineering Course

We offer research and education regarding system control theory and its application to electric power systems, noise reduction in DC-DC converters acting as an electric energy conversion device, as well as research on making new systems to achieve high-performance, high-reliability, intelligence and downsizing in the field of electric machinery, power electronics and motor drives from both aspects of analysis and experiment. In addition, research is being conducted on the applications of superconducting technology for electric power system with high-quality and high-reliability. Education and research regarding degradation diagnosis technology of power distribution systems in order to upgrade reliability is also being developed.

Communication Systems Engineering Course

Research and education is conducted on electronic circuits, LSI, computers, wireless communication, RF engineering, etc., which support an advanced information and telecommunications network society. Particular emphasis is placed on satellite communication technology, aerospace electronics, wireless power transfer technology, small built-in antenna technology, optical fiber communication technology, ultra-high frequency circuit technology, system LSI technology, development of intelligent system using soft computing, and wireless sensor network technology.

Curriculum

"Advanced Lectures on Electrical and Electronics Engineering" is the core of the course work. It is a high-level lecture class on the fundamentals of the three fields. Students study the basics and recent R&D trends of electronic materials and devices, stability of electric power systems, fundamental analysis of electric machinery, and foundations of analog/digital circuit theories for communication systems, through which they gain an understanding of the interrelationship of each field with others in the course.

"Advanced Lectures on Electrical and Electronics Engineering," special research, and seminar are required subjects, 12 credits. Eighteen credits or more should be acquired from elective classes mainly offered by the three courses, of which 6 or more should be obtained from one of the courses.

Master's Program Outline

Architecture and Architectural Engineering

Architecture is a whole spectrum of technologies we humans use to organize and create space for various purposes. The Architecture program is divided into three courses: Architectural Planning, Building Environment, and Building Structure. The course takes over from the undergraduate curriculum and offers comprehensive education and research opportunities.

01.Educational Objective

The Department of Architecture is concerned with the education of professionals with expertise in the craft and philosophy of creating humanistic space, and with the technical skills necessary for the architecture industry. Our educational philosophy focuses on both the preservation of inherited artisanship and the use of current scientific and technological advances to create sustainable livable environments that reduce the negative impact of humankind on the natural environment while maintaining a comfortable living environment for humanity.

Students learn to identify and solve architectural problems by developing a sophisticated ability to conduct experiments and analysis. On this foundation both specialized and interdisciplinary studies can be undertaken, as collaboration with experts from different fields is the cornerstone of professional development in the field of architecture.

02.Admission Policy

①Qualities

The Architecture Department seeks the following candidates:

a)Creative individuals with the ability to independently conceptualize the true value inherent in the human environment.

b)People who are equipped to engage in discussion and collaboration with passion and a strong sense of responsibility.

c)Individuals with a strong ability to conceptualize and formulate ideas that contribute to the identification of design and construction problems, and the imaginative capacity to resolve those problems.

②Prerequisite Knowledge

Prior to entrance, the prospective student ought to possess a strong foundation in architectural design and construction, and a working ability in a foreign language (priority given to English).

③Selection Process (General Selection)

The candidate's eligibility will be evaluated based on their undergraduate transcript, an application essay, both oral and written exams, and an interview. In addition to passing the required tests, prospective students must demonstrate their knowledge of Architecture and Architectural Engineering, their educational goals, their foreign language skills (priority given to English), as well as their undergraduate performance in courses related to Architecture and Architectural Engineering, and in foreign language courses (priority given to English). In addition the candidate must demonstrate their commitment to their personal and professional development.

Architectural Design Work Experience Program

The eligibility requirements for the Architect Examination were changed when the Architect Act was revised in November 2008. Accordingly, the practical experience criteria at the graduate school were also modified. The Architectural Design Work Experience Program was introduced in April 2009 for all three courses (Architectural Design, Structural Design, and Environmental Design). Students will be able to obtain up to two years of practical work experience, depending on the number of credits earned.

Professional Skills Development

◎Those who take the initiative to create an environment that can bring out the best of human nature.

◎Those who are good communicators and team players ready to take action on their own initiatives.

◎Those who can conceptualize ideas to make them reality and those with the ability to identify and solve problems.

Course Work

Architectural Design Course

Education and research fields: Architectural Design for Diverse Use, Urban Landscape Improvement and Preservation of Historical Environments, Improvement of Living Environments and Welfare Environments through Practical Activities in the Region.

Environmental Design Course

Through Environmental Design, students will study and research heating and lightning of living environments, along with indoor environmental control such as air quality, and utilities and equipment used within a building.

Structural Design Course

Through Structural Design, students will research and study structural mechanics, load evaluation, evaluation of structural performance, structural optimization, building materials, and construction engineering.

Curriculum

【Architectural Design Course】

The Architectural Design Seminar is a studio class focusing on architectural, city/town and community planning, and other practical design work. Students will cultivate creativity, train their ability to make comprehensive decisions, and acquire diverse and practical skills in architectural design. "Advanced Architectural Design I and II." in contrast to studio work, are classes that give students an opportunity to acquire the necessary viewpoints, techniques, technology, and a wide range of knowledge necessary to design buildings and plan cities through architecture.

【Environmental Design Course】

The Environmental Design Seminar develops students'practical abilities in assessing the overall environmental quality of a building's interior and exterior surroundings from the viewpoints of energy efficiency, ease of use, resource efficiency, artistic effect, and many other various aspects. The Advanced Environmental Design class will provide students with the knowledge and skills necessary to perform comprehensive environmental quality assessment.

【Structural Design Course】

To design a structure, it's necessary to make complete use of a variety of knowledge and techniques. Through the Seminar for Advanced Structural DesignIand II, students will develop the comprehensive ability to design structures, assess external force, perform stress deformation analysis, design infrastructure along with various other structures in structural design. Advanced Structural DesignIand II will provide students with the crucial knowledge and skill required to study structural design.

Master's Program Outline

Chemistry, Biotechnology and Chemical Engineering

The Department of Chemistry, Biotechnology, and Chemical Engineering conducts research regarding material and life sciences on the foundations of key technology to support a sustainable society. Studies comprise of three courses: In the Applied Chemistry Course and Biotechnology Course, research is centered on high-functional materials, new substance creation, chemical measurement, environmental engineering, biomimetic device, molecular conjugates, and drug/medical-supplies development. The Chemical Engineering Course covers high-functional material processing, reaction/separation process, resource circulation process, environmental conservation/improvement, energy utilization devices, material production process, and bioprocess.

Taking a practical approach by tackling the subjects of health, safety, environment, materials, energy, life phenomena and other such pressing issues of our time, we develop researchers and engineers whose capabilities cover everything from basic research to advanced engineering.

01.Educational Objective

The educational objective of the Department of Chemistry, Biotechnology and Chemical Engineering is to foster in students the acumen to apply new technology and advanced specialized knowledge to the development of an industrial structure that aspires to create harmony between society, technology, and the natural environment.

Following this philosophy, our goal is to encourage students to actively contribute to globalized society as highly skilled experts in chemistry, biotechnology and chemical engineering. With this broad outlook, the flexibility to make ethical judgments and apply creative thinking, our students can become global leaders in fields associated with chemistry, biotechnology and chemical engineering.

02.Admission Policy

①Qualities

The Department of Chemistry, Biotechnology and Chemical Engineering seeks the following candidates:

a)Individuals with sufficient academic ability in chemistry, biotechnology and chemical engineering to apply the department's educational objectives to their research and professional development.

b)Inquisitive students with the ability to think creatively and flexibly, and having a strong desire to learn.

c)Individuals who have a global perspective on issues connected to chemistry, biotechnology and chemical engineering.

d)People who will cultivate their expertise and ethical judgment in order to engage with new scientific techniques.

②Prerequisite Knowledge

Prior to entrance, the prospective student ought to possess a strong foundation in chemistry, biotechnology and chemical engineering, in order to acquire a high level of professional competence.

③Selection Process (General Selection)

The candidate's eligibility will be evaluated based on their undergraduate transcript, an application essay, both oral and written exams, and an interview. In addition to passing the required tests, prospective students must demonstrate their knowledge of chemistry and biochemistry through reference to problems related to this field. They must identify their educational goals, their foreign language skills (priority given to English), as well as their undergraduate performance in courses related to chemistry, biotechnology and chemical engineering, and their ability to read a foreign language (priority given to English). In addition the candidate must demonstrate their commitment to their personal and professional development.

Professional Skills Development

◎Those who are flexible thinkers and have an inquisitive natures and can use them to solve problems flexibly and creatively.

◎Those who can make the most of what they learn to work across national borders.

◎Those who have the knowledge and sound ethical judgment necessary to keep pace with chnological innovation.

Course Work

Applied Chemistry Course

Our research and education program aims to foster creativity and ability that excels in developing useful materials, material surface observation techniques, micro-reactors, and environmental conservation technologies, etc. and convey it to the world.

Biotechnology Course

Our research and education program aims to foster in students the ability to develop new drug, medical treatment, diagnosis or bio-based materials for creating a sustainable society, and to generate idea and results based on the educated knowledge and technigue to the world.

Chemical Engineering Course

Our research and education program aims to foster future researchers and engineers who will be active in the fields of "development of eco-friendly chemical processes", construction of energy and resource utilization systems," and invention of highly functional materials."

Curriculum

【Applied Chemistry Course】

A series of lectures aimed at giving students a chance to acquire knowledge and advanced analytical techniques concerning the development of useful materials based on molecular orbital theory, material surface observation technology, new functional materials, and clean energy.

【Biotechnology Course】

A series of lectures aimed at giving students a chance to acquire knowledge concerning elucidation of biological and mdecular mechanisims, drug development, nanotechnology for diagnosis, and biomaterials.

【Chemical Engineering Course】

A series of lectures aimed at giving students a chance to acquire knowledge concerning processes such as reaction, separation, energy transfer/conversion, resource circulation, and functional material processing , and bio processing along with the advanced system engineering which combines these processing elements.

Master's Program Outline

Ocean Civil Engineering

With consideration to the unique characteristics of Japan and Kagoshima Prefecture, the Department of Ocean Civil Engineering engages in deepening the understanding of physical phenomena and matter cycle processes along with research and education in the fields of environmental preservation, disaster prevention, and utilization and development of regions from the coast to the open oceans. Furthermore, the department also conducts research and education in survey, assessment, planning, construction, and maintenance of off-shore structures, near-shore areas and coastal public works.
Using basic and specialized studies in civil engineering and oceanography as a foundation, students acquire advanced knowledge and technical skill in seeking greater understanding of coastal and off-shore regions of the ocean, comprehensive understanding of the global environment, development of environmental conservation, and survey, assessment, planning, construction, and maintenance (including disposal) of disaster prevention public works and off-shore structures.

01.Educational Objective

The educational objective of the Department of Ocean Civil Engineering is to develop in students the knowledge and judgment to fully understand the deep connection between the ocean and civil engineering, through research and activities related to professional development.

02.Admission Policy

①Qualities

The Department of Ocean Civil Engineering seeks the following candidates:

a)Individuals with sufficient academic and communicative ability, and a high level of motivation to learn about ocean civil engineering in accordance with the educational objective.

b)Students who can apply a wide-ranging global view to the sustainable development of the country's ocean and land, with the aim of achieving harmony with nature.

c)Students whose goal in this department is to acquire a high degree of fundamental knowledge in order to ethically contribute to the regional and international community.

②Prerequisite Knowledge

Prior to entrance, the prospective student ought to possess a strong foundation in ocean civil engineering, and a working ability in a foreign language (priority given to English) to further their professional knowledge.

③Selection Process (General Selection)

The candidate's eligibility will be evaluated based on their undergraduate transcript, an application essay, both oral and written exams, and an interview. Prospective students must demonstrate their knowledge of Ocean Civil Engineering, their educational goals, their foreign language skills (priority given to English), as well as their undergraduate performance in courses related to Ocean Civil Engineering, and their ability to read a foreign language (priority given to English). In addition the candidate must demonstrate their commitment to their personal and professional development.

Professional Skills Development

◎Those who have the ability to make free use of the specialized knowledge gained through the study of ocean civil engineering to deal with advances in science and technology with an open mind.

◎Those who have the ability to proactively create a sustainable society where humans and nature coexist in symbiosis.

◎Those who can deeply respect and support the global scale on which humans and nature interact with each other.

Course Work

Environmental Systems Engineering Course

Education and research focuses on the utilization and development, along with elucidation of physical phenomena in coastal and off-shore regions, environmental conservation, and disaster prevention.

Construction Systems Engineering Course

Education and research focuses on the planning, construction, and maintenance of public works and off-shore structures from near-shore areas to off-coast regions.

Curriculum

Studies are divided into two fields: the Environmental Systems Engineering Seminar and Construction Systems Engineering Seminar are advanced lecture classes, and taking one or the other is required. These seminars provide fundamental and comprehensive knowledge students must acquire.

Master's Program Outline

Information Science and Biomedical Engineering

Information and Communication Technology (ICT) is the basis for a highly advanced information-oriented society, and demands for ICT is growing to make the world human- and environment-friendly. Particularly in Japan, a labor shortage is expected due to a rapidly aging population and low birth rates. Therefore, the realization of a computer-aided society where people of both gender and all ages are able to use computers efficiently is desired. This leads to the need for information system engineers with the knowledge and ability to apply that knowledge, along with a good understanding of the essences of cognitive science and biological systems as it applies to human beings. Additionally, as there has been great interest in experimenting with robots, cars, and other machines that can think, perceive, and make decisions in the same way as humans, the information science field has great potential for future growth. Therefore, engineers who understand the fundamentals of biological functions and how the human brain processes information are needed.
Research and education is divided into three courses: Information Systems Engineering, Brain Cognitive Science, and Biometric Engineering. These courses complement each other and foster highly specialized engineers and researchers.

01.Educational Objective

Our goal in the Department of Information Science and Biomedical Engineering is for students to engage in academic scholarship, combining fact and theory to gain a fundamental understanding of Information Science and Biomedical Engineering through educational experiments and research. Our students undertake professional development by gaining the knowledge and practical application skills to uncover the mysteries of human cognition, in the service of advancing human culture. We aim to develop in our students the ability to practically apply creative problem solving to the complex field of Information Science and Biomedical Engineering, and to ethically address problems of a specialized nature with integrity.

02.Admission Policy

①Qualities

The Department of Information Science and Biomedical Engineering seeks the following candidates:

a)Individuals with a strong academic foundation and developed communication skills who aim to meet the educational objective.

b)Students with a strong interest in Information Science and Biomedical Engineering, and who are willing to face the challenges inherent in the many issues that surround it.

c)People who aspire to contribute to society both at a regional and international level, by applying their specialized knowledge and highly developed sense of ethics to the field of Information Science and Biomedical Engineering.

②Prerequisite Knowledge

Prior to entrance, the prospective student ought to possess a strong foundation in knowledge and skills relating to Information Science and Biomedical Engineering, and a working ability in a foreign language (priority given to English).

③Selection Process (General Selection)

The candidate's eligibility will be evaluated based on their undergraduate transcript, an application essay, both oral and written exams, and an interview. Prospective students must demonstrate their knowledge of Information Science and Biomedical Engineering, their educational goals, their foreign language skills (priority given to English), as well as their undergraduate performance in courses related to Information Science and Biomedical Engineering, and their ability to read a foreign language (priority given to English). In addition the candidate must demonstrate their commitment to their personal and professional development.

Professional Skills Development

◎Those with highly specialized knowledge and have the ability to make sound ethical judgments in order to cope with a diverse and dynamically changing society.

◎Those who possess the creative capacity to invent new technologies and solve problems related to information science and biomedical engineering.

◎Those who are highly-motivated to lead an advanced information-oriented society and those who are committed to contributing to local and global communities.

Course Work

Courses are aimed at fostering students who excel in more than one field based on the broad understanding of information science and biomedical engineering and cover both the information systems field and the cognitive biomedical systems engineering field. For this reason, "Information Systems Engineering Special Lecture" and "Cognitive Biomedical Engineering Special Lecture"are required classes that cover both fundamental and specialized content for their respective field. Students are required to obtain more than 6 credits from both required and elective classes contained in the coursework. The coursework focuses on basic yet comprehensive knowledge that students must acquire in their respective fields. All classes are meant to develop highly-knowledgeable engineers who can support an advanced information-oriented society.

Information Systems Engineering Course

Education is focused on computer-based data processing and networking. Through specialized research and seminars, we develop advanced professional engineers and researchers in the field of information systems engineering.

Cognitive Biomedical Systems Engineering

Education is focused on cognitive science and somatometric studies. Through specialized research and seminars we develop advanced professional engineers and researchers in the field of cognitive biomedical systems engineering.

Curriculum

Students will be able to gain highly specialized knowledge through classes from their own major, but also a wider range of knowledge through classes from other courses. Additionally, students will be able to conduct research on secondary subjects under a faculty member other than their academic advisor in"Information Science and Biomedical Engineering Specialized Research III"in order to gain a broader field of view related to information science and biomedical engineering while advancing their studies.

Master's Program Outline

Mathematics and Computer Science

We teach and research fundamental structures in mathematics and their analysis. We also teach and research on mathematical sciences, which have been diversifying due to interactions with many other scientific and cultural areas, their related areas as well as theoretical fundamentals of information/computer science. Our aim is to enable students to understand fundamental theories in mathematics deeply as well as to understand theories of information/computer science and mathematical analysis of various phenomena of nature and society that become a driving force for developments of mathematical sciences, and to have the ability of applying their knowledge.

01.Educational Objective

In the Department of Mathematics and Computer Science we aim to foster the development of professional researchers, technologists, and educators through the in-depth study of mathematics, statistics, and information technology. Through lectures and seminars, students will develop creative and flexible approaches to solving complex mathematical problems.

02.Admission Policy

①Qualities

The Department of Mathematics and Computer Science seeks the following candidates:

a)Individuals with a strong interest in mathematics, statistics, and information technology.

b)Ambitious students with a strong desire to learn, and to tackle complex mathematical issues.

②Prerequisite Knowledge

Prior to entrance, the prospective student ought to posses a strong foundation in calculus, linear algebra, and statistics. Furthermore, a highly developed ability to think logically, as well as the ability to express ideas to others is essential.

③Selection Process (General Selection)

The candidate's eligibility will be evaluated based on their undergraduate transcript, an application essay, both oral and written exams, and an interview. Prospective students must demonstrate their knowledge of the fundamentals of mathematics including calculus and linear algebra, their ability to apply their knowledge, their communication skills, and their ability to think logically. Undergraduate performance in courses related to Mathematics and Computer Science will also be taken into consideration. The student must also possess enough English skill to be able to understand English-language study materials. In addition the candidate must demonstrate their commitment to their personal and professional development.

Professional Skills Development

◎Those who address the challenges in the rapidly developing field of science and technology by making full use of high sense of ethics and the specialized knowledge of mathematics and computer science.

◎Those who innovate and address the new challenges in the related field of mathematics and computer science from their own motive and who have willingness and capability to respond needs of society.

◎Those who can support social foundations by contributing to regional and global communities with a strong sense of duty.

Course Work

Pure Mathematics Course

Mathematics provides a theoretical basis vital to the progress of science and technology brought by the development of natural science. This course focuses on research and education regarding the theoretical system of mathematics and development of research and education on fundamental structure of mathematics in the subjects of algebra, analysis, and geometry.

Environmental Systems Engineering Course

This course focuses on research and education regarding the theoretical aspects of mathematical science and its applications along with analysis of the various phenomena found in nature and society.

Construction Systems Engineering Course

The remarkable advancement of computer technology in recent years has also resulted in the rapid development of the information/computer science. This course conducts research and education on mathematical theory in this field and its applications.

Curriculum

To provide a wider range of advanced education and research focused on specialty fields compared to education at the undergraduate level, we offer required subjects corresponding to 16 credits.

"Advanced Studies in Mathematics and Computer Science" covers the fundamental and comprehensive materials necessary to study mathematics and computer science.

In addition to the required subjects (16 credits), students must obtain a total of 30 credits or more from elective subjects, including 6 subjects from the"Pure Mathematics", "Applied Mathematics", or "Computer Science" course. These subjects should be selected upon consultation with faculty advisors.

Master's Program Outline

Physics and Astronomy

Physics, including astronomy, forms the foundation of science and technology that address all phenomena in the universe and that contribute all of developments in human life. It spans a wide range, from Planck-scale microcosmos of elementary particles, through the meter scale of our daily life, to the gigapasec scale of cosmology.
The Department of Physics and Astronomy is promoting researches on basic and fundamental laws of the nature, such as physical properties of matters under very low temperature or strong magnetic fields, chaotic or nonlinear dynamics, observational and numerical astronomy, and meteorology with space science. The department also aims education to train logical and practical abilities for solving complex problems, which mankind faces or which next generation needs to solve, using physical formulae.
Our department is in alliance with the JAXA (Japan Aerospace exploration Agency) and the NAOJ (National Astronomical Observatory of Japan) to forma a cooperated graduate school. We have a cooperation agreement with Ehime University to conduct joint research and education programs in both the graduate and undergraduate levels. We have also made cooperation agreements with the NAOJ, Hokkaido University, University of Tokyo, Tokyo Institute of Technology, Nagoya University, Kyoto University, and Hiroshima University for research and education in the field of infrared astronomy. These collaborations promote space researches using spacecrafts and the VERA Telescope to study the structures and characteristics of the celestial bodies in the Milky Way Galaxy.

01.Educational Objective

In the Department of Physics and Astronomy we aim to develop professionals who can play a leadership role in society by using their expertise in innovative ways. Students will cultivate their problem-solving ability through experiments and research related to astronomy and materials science.

02.Admission Policy

①Qualities

The Department of Physics and Astronomy seeks the following candidates:

Highly motivated individuals with a firm grasp of the fundamentals of physics, who aim to advance their education through research and experiments in accordance with the educational objective. (See the diploma policy.)

②Prerequisite Knowledge

Prior to entrance, the prospective student ought to possess a strong foundation in matters relating to physics and astronomy, as well as communication skills in a foreign language (priority given to English), in order to accurately convey and receive information about physics and astronomy with overseas researchers.

③Selection Process (General Selection)

The candidate's eligibility will be evaluated based on their undergraduate transcript, an application essay, both oral and written exams, and an interview. Prospective students must demonstrate their knowledge of Physics and Astronomy, their educational goals, their foreign language skills (priority given to English), as well as their undergraduate performance in courses related to Physics and Astronomy, and in foreign language courses (priority given to English). In addition the candidate must demonstrate their commitment to their personal and professional development.

Professional Skills Development

◎Those who can apply their specialized abilities and flexible thinking skills in physics to work on deepening and advancing science and technology.

◎Those who can contribute to the creation of a sustainable society in the global environment.

◎Those who can commit human activity in the natural world with a deep insight and a global mind.

Course Work

Physics Course

Education and researches focusing on deepening our understanding of electronic and magnetic properties of solids, thin films and solid surfaces by first-principle calculations, the searches for new functional materials, studies on basic chaos theory, understanding of various non-linear phenomena, investigation of characteristics in alternating fields of dielectrics, electric, magnetic, and thermodynamic research on different types of strongly correlated multilayer materials including magnetic substances such as oxide superconductors under high temperature, rare earth elements, and transition metal elements.

Astronomy Course

Researches on astronomy and space science. Observational and theoretical studies of the galactic dynamics and structure, Physical processes in star formation and evolution, and high-energy phenomena in the vicinity of black holes, using optical/ infrared and radio telescopes. Theoretical and numerical approaches for studying galactic dynamics, cosmology, and gravity.

Curriculum

A total of 30 units or more must be obtained. 16 must be from required classes and more than 6 credits are needed from elective classes related to the student's selected course. Other credits should be obtained after consultations with the student's supervisor in accordance with a student's research field and chosen course.

Master's Program Outline

Chemistry and BioScience

Advanced research in the study of chemistry and biology has been making enormous progress while each field continues to exert its influence on the other. In the Department of Chemistry and BiosScience we foster human resources who will actively contribute to a wide range of the fields through education and research. Lecture classes are provided in basic chemistry, biochemistry, molecular biology, cell biology, developmental biology, and physiology. Our goal is to have students recognize the behavior of simple molecules, and understand the complex structures of molecules and the phenomenon of life on the bases of molecules. In order to advance knowledge and skill in a specific field, students can choose one of the following courses: Molecular Photonics and Colloid Science, Organic and Biological Chemistry, or Bio-Dynamics. We aim to develop specialists who can actively contribute to the fields of chemistry and biology.

01.Educational Objective

In the Department of Chemistry and BioScience we aim to produce a high number of professionals who can contribute to the advancement of the regional and international scientific community, with a special focus on the combined fields of chemistry and bioscience. To achieve this goal, the core of our educational philosophy is to equip our students with a high level of specialized knowledge and practical skills in biology and chemistry, through research and education.

02.Admission Policy

①Qualities

The Department of Chemistry and BioScience seeks the following candidates:

a)Highly motivated individuals who can utilize their academic ability in chemistry and bioscience to achieve the educational objective.

b)Rational, flexible thinkers who have the ability to clearly explain and present the content and plan of their research.

c)Individuals who have a high level of interest in matters relating to chemistry and bioscience and who are enthusiastic about making a meaningful contribution to its development.

d)Students who want to contribute to the advancement of society by undertaking rigorously scientific and ethical research in chemistry and bioscience.

②Prerequisite Knowledge

Prior to entrance, the prospective student ought to possess a strong foundation in matters relating to chemistry and bioscience, as well as communication skills in a foreign language (priority given to English), in order to accurately convey and receive information about new techniques in chemistry and bioscience, with overseas researchers.

③Selection Process (General Selection)

The candidate's eligibility will be evaluated based on their undergraduate transcript, an application essay, both oral and written exams, and an interview. Prospective students must demonstrate their knowledge of chemistry and bioscience their educational goals, their foreign language skills (priority given to English). In addition the candidate must demonstrate their commitment to their personal and professional development.

Professional Skills Development

◎Those who can think flexibly, possess an inquisitive nature, and can seek creative solutions to issues related to chemistry and bioscience.

◎Those who possess expert knowledge in chemistry and biology, and will positively work to construct a sustainable global community where nature and human beings can coexist.

◎Those who possess the ability to make sound ethical judgments and make global contributions.

Course Work

Molecular Photonics and Colloid Science Course

Education and research related to photochemistry of molecular aggregates and condensed systems, chemistry of functional molecular aggregates, environmental catalyst chemistry, clean energy, and medical care.

Organic and Biological Chemistry Course

Education and research related to the chemistry of naturally occuring organic compounds, synthesis and organic reactions of organic compounds, protein chemistry, enzyme chemistry and antibody/peptide molecule design.

Bio-Dynamics Course

Education and research related to symbiosis between plants and microorganisms, gene expression analysis of viruses of plants and microorganisms, body axis formation of vertebrates, reproduction and generation of marine invertebrates, circadian rhythm of animals, neuro-physiology of taste and neural mechanisms of taste behavior of fish.

Curriculum

A variety of classes are offered to allow students to obtain a higher level of expertise and skill using knowledge acquired during their undergraduate studies as a basis. Chemistry and Bioscience Thesis Reading, Chemistry and Bioscience Special Research, and Special Lecture on Advanced Chemistry (Master's Program) are required subjects. Students are required to take a total number of 16 credits from the above.

A total of 30 credits or more must be obtained. 16 must be from required classes and more than 6 credits are needed from elective classes related to the student's selected course. Other credits should be obtained from other classes after consultations with a faculty advisor.

Master's Program Outline

Earth and Environmental Science

The department of earth and environmental sciences promotes education and research from a global perspective through comprehensive understanding of the Earth, a place where human live and interact, which comprises of geosphere, hydrosphere, and biosphere. The department of earth and environmental sciences carry out research and education in order to understand the actual conditions of the natural environment and basic mechanism of fundamental changes that occur, emphasis is put particularly on the fields of geology, biology, and chemistry. Students are encouraged to conduct field work to directly observe the geosphere, hydrosphere, and biosphere.
We aim to foster human resources who can think flexibly and comprehensively, who possess not only highly advanced and specialized knowledge but a wide range of knowledge and learning which goes beyond the conventional realm of their academic fields.

01.Educational Objective

The site of human existence on Earth can be viewed as a synthesis of the geosphere, the aquasphere, and the biosphere. Our aim in the Department of Earth and Environmental Science is to develop professionals to become leading specialists who can apply their knowledge and ethical judgment to find innovative solutions to global problems.

02.Admission Policy

①Qualities

The Department of Chemistry and Bioscience seeks the following candidates:

Highly motivated individuals with a strong foundation in Earth and Environmental Sciences, who are willing to undertake the necessary education and research to meet the educational objective.

②Prerequisite Knowledge

Prior to entrance, the prospective student ought to possess a strong foundation in subjects relating to Earth and Environmental Science, including earth science, biology and chemistry. It is necessary to have the technical skills to undertake scientific experiments. The ability to understand research in a foreign language (priority given to English) is also required.

③Selection Process (General Selection)

The candidate's eligibility will be evaluated based on their undergraduate transcript, an application essay, both oral and written exams, and an interview. Prospective students must demonstrate their knowledge of Earth and Environmental Science, their educational goals, their foreign language skills (priority given to English), as well as their undergraduate performance in courses related to Earth and Environmental Science, and their ability to read a foreign language (priority given to English). In addition the candidate must demonstrate their commitment to their personal and professional development.

Professional Skills Development

◎Those who will advance scientific technology by using their specialized ability concerning the earth and environmental sciences from a broad perspective.

◎Those who can positively work to construct a sustainable global community where nature and human beings coexist.

◎Those who possess a deep reverence for the global scale on which humans interact with nature and the ability to work with that sense of reverence.

Course Work

Geological Science Course

Education and research fields: Understanding of Tectonic History from the Southwestern Japanese Arc to the Ryukyu Arc, Fossil Based Study of Biological Evolution, Concrete Analysis of the Earth's Biosphere and Maintenance System of the Global Environment, Prevention of Landslide Disasters, Earthquakes and Volcanic Eruptions, Understanding of Plate Tectonics between the Kyushu Mainland and the Nansei Islands and Prediction of Earthquakes and Volcanic Eruptions.

Environmental Analysis Course

Education and research fields: Development of Highly Sensitive Analytical Methods for Measurement of Trace Substance such as Mercury that would affect the Environment and furthering the Understanding of the Chemical Forms of Trace Elements in the Environment (air, water, substratum, organisms) in the Field of Inorganic Analytical Chemistry; Study of Ion Dissolution Status and furthering this Material's Chemical Reactions.

Biodiversity Course

Education and research fields: Ecological Studies of Land Based on Flora and Mollusks from Southwest Japan to Southeast Asia, Studies in Genetic Diversity on the Molecular and Cellular Levels, and Classification and Ecology of Benthic Organisms in Shallow and Freshwater Environments.

Curriculum

Research of the natural environment requires multiple approaches from various fields. Students are encouraged to study a different number of fields not limited to the particular field of their specialization. A total of 30 credits or more must be obtained. 16 must be from required classes and more than 6 credits are needed from elective classes related to the student's selected course. Other credits should be obtained after consultations with a student's respective faculty advisor in accordance with a student's research field and chosen course.

Doctoral Program Outline

Interdisciplinary Department of Science and Engineering

Due to changes in society and the pressures of globalization, the conventional pattern of education and research for general science and engineering majors no longer suffices. To develop the skills necessary for today's science and engineering professionals, two new courses have been created.
The first course, the Research Foundation Course, was created to broaden and stimulate the training for future researchers, while furnishing them with a strong basis of knowledge and ethical judgment. The curriculum for what was formerly the departments of Material Science and Production Engineering, System Information Science, and Life and Environmental Sciences, will now come under the joint administration of the Graduate School of Medical and Dental Sciences, and the United Graduate School of Agriculture.
The second course, Advanced Topics in Engineering, focuses on developing research skills among people already working in the field of business, to generate innovation in industry, and contribute to the advancement of the knowledge base, flexible conceptual skills, and problem solving ability of these professionals. The Graduate School of Science and Engineering is well placed to administer this course, with research being carried out in regional development, leadership training, engineering safety, environment, energy, medical and social welfare engineering, and astronomy/space science. Through this course the Graduate School of science and Engineering also aims to fortify the structure of these fields.

01.Educational Objective

The philosophy of the Graduate School of Science and Engineering is to develop truth-loving, highly ethical, self-motivated individuals who can meet challenges and contribute to the development of the regional and international community through the creation of an education and research system and framework that responds to the demands of the times. In order to live up to this philosophy, we have set ourselves the objective of developing capable people who study and teach the most recent academic theories and findings in the fields of science and engineering. From foundational to practical application, we delve deeply into scientific inquiry and contribute to the development of human civilization. In order to achieve this objective, one further objective is necessary: To cultivate engineers, researchers, and highly specialized, next-generation professionals who possess the sound ethical judgment necessary to confront contemporary issues, who have comprehensive knowledge about the environment, and who can respond extensively and flexibly to the advancement and diversification of natural science.

02.Admission Policy

①Qualities

The candidate

a)shares the principle of the Graduate School of Science and Engineering, has the basic ability and motivation to realize it, thinks logically and rationally, and has good communicative skills.

b)is deeply interested in different issues in science and engineering, sparing no effort in grappling with a variety of problems who has a strong inquiring spirit.

c)is willing to sharpen their skills, formulating scientific and multi-dimensional execution plans and analyzing their results logically in order to clarify different phenomena in science and engineering.

d)appreciates the different values and cultures of the world, has high ethical standards and is keen to use the expertise acquired at the Graduate School of Science and Engineering to make contributions to local and global communities.

e)is willing to become a scholar or highly qualified professional in science or engineering and is eager to take on the responsibilities of leadership.

②Prerequisite Knowledge

The successful candidate will have advanced expert knowledge/skills in science and engineering, and advanced knowledge/fluency in a foreign language [English].

③Selection Process (General Selection)

The selection criteria include the results of an oral examination, school records, master's thesis and research proposal, and advanced knowledge/skills and aptitude/motivation in the specialization. These skills are necessary for the candidate to become the kind of researcher who can meet the Educational Objective.

Professional Skills Development

◎To develop professional researchers and engineers who can take responsibility for the next generation, with a wide-ranging flexible outlook, and a diversity and excellence in scholarship in the natural sciences, as well as developing integrated knowledge and ethical integrity to face today's wide range of issues, encapsulating nature and humanity.

◎To support researchers in using ethical judgment and comprehensive knowledge in the pursuit of successful work in the wide-ranging field of science and engineering.

◎To help future research and development professionals acquire problem solving skills and specific knowledge in natural science, and an open attitude to flexible ways of thinking, in order to contribute to innovation in industries related to their chosen fields of specialization.

Foundations in Research Course

This course is mainly targeted at those already employed in their field, researchers, and international students aiming to become professors. With the aim of training researchers who can have a significant impact on the wide-ranging fields in science and engineering, research skill in one specific area of a science or engineering specialization is not enough. By developing an integrated, scholarly approach, researchers will have the agility to solve a considerable range of issues. It is this development that is our main educational objective.

Field

Interdisciplinary Field

Kagoshima University Graduate School of Medical and Dental Science, and the United Graduate School of Agriculture are endowed with a unique characteristic; with this new collaboration, conventional knowledge and ways of thinking have not yet been established. Therefore it will be possible to take multiple viewpoints and develop progressive ways to solve research issues with the aim of training innovative professionals.

Material Science and Production Engineering

Our aim is to undertake fundamental, integrated research and education to examine materials production sciences, from the production of material through to the fabrication process of industrial manufacturing. Building on a background of broad foundational knowledge, our research must involve developing a symbiotic relationship with the environment. Researchers need an understanding of the careful use of energy and the flexibility to respond to changes in the diversification and complexity of industrial activity, taking into account its impact on the natural environment.

System Information Science

We aim to train professionals not only to acquire leading expertise in their specific field, but also to build on the relevant foundational knowledge to realize multiple research areas in order to utilize high tech skills to create integrated technology systems, and in this way conduct a high level of original, creative research and development over a wide range of topics.

Life and Environmental Sciences

We aim to train professionals not only to acquire leading expertise in their specific field but also to build on the relevant foundational knowledge to be able to find the convergence between various areas of research in order to deepen the understanding of the various functions of life, its structures and fluctuations, the Earth and space (nature) which supports life, and the symbiotic relationship between the environment and the life it contains. Our students are also encouraged to personally participate in circulating their research within the international community.

Advanced Studies in Science and Technology Course

This course is mainly targeted at students who wish to enter a doctoral program directly after completing their Masters', with the aim of finding employment in industry. Students wishing to undertake professional development to become leaders or entrepreneurs for smaller regional businesses, or who wish to contribute to innovation and global activity in research and development at large companies, should consider this course.

Field

Energy and the Environment

Our target is all things connected to human life and ecosystems, from micro-chemical environments, to the built world of human-scale architecture, to the mezzo-scale marine environment. In order to understand the needs of society from a global perspective, students will engage in work that combines various fields of study in order to acquire leading-edge knowledge. Our aim is to train professionals who have the creative skill to design and implement plans for a sustainable society.

Medical and Public Health Engineering

Our society is facing both an aging population and a declining birthrate. From now on, both medical treatment and public healthcare will become increasingly complex and diverse, and professionals in the field must be able to contribute their knowledge of human cognition and organic systems. We aim to train professionals who can respond flexibly to these needs, by developing a high sense of ethical standards and full knowledge of medical engineering and public health engineering.

Regional Value Creation and Safety Engineering

It is through the sustainability and conservation of the natural environment, we are able to create safe, worry-free living spaces that are accessible to all. At the regional level we must face complex, diverse changes occurring to industrial activity, and the natural environment. By polishing their skills in research and education, our students can flexibly apply fundamental, comprehensive knowledge to create tangible solutions to the threats we face in our world.

Advanced Material Science

We expect our graduates to become professionals who can bring about innovation in manufacturing. To this end, our students develop a deep knowledge of the fundamental physical properties and structure of materials, as well as the ability to conduct functional assessments, functional instrumentation analysis, predictive simulations of changes in function and traits, and gain an understanding of manufacturing processes, systems control, nanostructure control, function and trait expression mechanisms, and resource recovery.

Astronomy and Space

Building on a background of extensive foundational knowledge in astronomy, space science, Earth science and/or space engineering, and with the careful observation of astronomical objects, space, and Earth as our aim, we are engaged in the development of equipment and data processing systems. In addition, from development to application of equipment and systems, we employ practical observations in understanding the universe. We aim to train professionals who can make original, high quality contributions to research and development in this interdisciplinary field.

Post-Graduate Program Course and Admission Guide

Master's Program

- Enrolled for two or more years
- Earned a total of more than 30 credits including more than the 20 pre-designated credits in each relevant department
- Pass the thesis assessment and final examination

The following is the number of credits which must be obtained from department:

Major	Required Classes	Required Electives	Other Departments※1	Early Completion Course※2
Mechanical Engineering	10 credits or more	6 credits or more	Up to 10 credits	Credits for required subjects in the second year (4 credits) can be exempted by taking the equivalent number of credits from electives.
Electrical and Electronics Engineering	12 credits or more	6 credits or more		
Architecture and Architectural Engineering	9 credits or more	10 credits or more		Credits for required and elective classes for the second year (credits corresponding to the number of classes) can be exempted by taking the equivalent number of credits from electives.
Chemistry, Biotechnology, and Chemical Engineering	10 credits or more	10 credits or more		Credits for required subjects in the second year (2 credits) can be exempted by taking the equivalent number of credits from electives.
Ocean Civil Engineering	8 credits or more	8 credits or more		Credits for required subjects in the second year (1 credit corresponding to the number of classes) can be exempted by taking the equivalent number of credits from electives.
Information Science and Biomedical Engineering	12 credits or more	6 credits or more		Credits for required subjects in the second year (4 credits) can be exempted by taking the equivalent number of credits from electives.
Mathematics and Computer Science	16 credits or more	6 credits or more	Up to 8 credits	Credits for required subjects in the second year (8 credits) can be exempted by taking the equivalent number of credits from electives.
Physics and Astronomy				
Chemistry and BioScience				
Earth and Environmental Science				

※1 Including class credits (credits) of other departments, divisions, or Japanese/foreign graduate schools
※2 Early completion in the case of a student enrolled more than one year and considered to be in excellent academic standing

Doctoral Program

- 3 years【Degree may be completed in more or less than 3 years,depending on study plan.】
- 12 credits in: Foundations in Research ・5 Required Classes. ・Minimum 7 non-compulsory Elective Classes.
  Advanced Studies in Science and Technology
  ・4 Required Classes. ・Minimum 6 Compulsory Elective Classes. ・Minimum 2 Non-compulsory Elective Classes.
- Successfully complete and defend a doctral dissertation.

The following is the number of credits required

Major	Required Classes※1	Compulsory Elective Classes	Non-compulsory Elective Classes	Other Divisions※2
Foundations in Research	5 credits	—	7 credits or more	Up to 4 credits
Advanced Studies in Science and Technology	4 credits	6 credits or more	2 credits or more	

※1 Including seminars in the relevant department (non-credit)
※2 Including class credits from other divisions, or Japanese/foreign graduate schools

Entry Guide

Selection	Master's Program	Doctoral Program
General Selection	Oral examination ▸July Written examination ▸August	August/February
Employed Individuals Special Selection	August/February	
Foreign Student Special Selection		

It is preferable that those wishing to apply for the Doctoral Program contact the relevant faculty advisor to discuss the content of the doctorate dissertation in advance.

Contact us

Contact for exam

Application details and important information (i.e., qualification, quota, application period, selection method, examination date) can be found on the homepage (www.kagoshima-u.ac.jp/exam)

GRADUATE SCHOOL OF SCIENCE AND ENGINEERING KAGOSHIMA UNIVERSITY SEARCH

For more information on application and the graduate school please contact

Graduate School Section, Graduate School Administrative Division, Administration Department, Graduate School of Science and Engineering, Kagoshima University
1-21-40 Korimoto, Kagoshima City, 890-0065
Tel .099-285-8234 Fax.099-285-3410
✉**daigakuin@eng.kagoshima-u.ac.jp**

Agreements with Institutions

Cooperation Agreements

Internal Institutions

Computing and Communications Center

The Kagoshima University Museum

External Institutions **【Affiliated Since】**

National Institute of Advanced Industrial Science Technology (AIST) ..... 2004/04/01～

Port and Airport Research Institute (PARI) ..... 2008/07/01～

National Astronomical Observatory of Japan (NAOJ) ..... 2004/04/01～

Japan Aerospace Exploration Agency (JAXA) ..... 2001/07/31～

National Institute for Minamata Diseas (NIMD) ..... 2009/04/01～

Academic Exchange Agreements

Japan **【Agreement Date】**

Project to establish network of optical and infrared astronomy research and education centers between universities ..... 2011/04/01～

Graduate School of Science and Engineering, University of Miyazaki ..... 2010/03/31～

Graduate School of Science and Engineering (Science), Ehime University, Research Center for Space and Cosmic Evolution ..... 2010/03/29～

Foreign Countries **【Agreement Date】**

The Energy Institute of the City University of New York (United States of America) ..... 2015/11/30～

École supérieure chimie physique électronique de Lyon (France) ..... 2014/10/03～

Universiti Teknologi PETRONAS (Malaysia) ..... 2012/07/06～

Faculty of Mechanical Engineering Universiti Teknologi Malaysia (Malaysia) ..... 2011/12/26～

Veer Narmad South Gujarat University (India) ..... 2011/09/13～

AGREEMENT TO CREATE AN INTERNATIONAL NETWORK (GDRI) "France-Japan-Vietnam Network in Singularity Theory" ..... 2011/01/01～

National Cheng Kung University, Engineering College (Taiwan) ..... 2005/12/23～

The Petroleum and Petrochemical College Chulalongkorn University (Thailand) ..... 2000/07/28～

University of Indonesia (Indonesia) *Inter-University ..... 2015/10/06～

Institut Teknologi Bandung (Indonesia) *Inter-University ..... 2010/11/22～

Linkoping University (Sweden) *Inter-University ..... 2010/06/11～

Universiti Malaysia Sabah (Malaysia) *Inter-University ..... 2009/03/04～

Universiti Malaysia Terengganu (Malaysia) *Inter-University ..... 2005/04/22～

National Institute of Technology Karnataka (India) *Inter-University ..... 2005/03/23～

Northeastem University (China) *Inter-University ..... 2004/12/03～

University of Technology,Sydney (UTS) (Australia) *Inter-University ..... 2000/03/01～

Hunan University (China) *Inter-University ..... 1998/04/29～

Associated Facilities

Nansei-Toko Observatory for Earthquakes and Volcanoes

The establishment of the Nansei-Toko Observatory for Earthquakes and Volcanoes was approved on April 11, 1991 as a facility to promote earthquake and volcanic eruption prediction research in part due to strong requests by the local community.
In November 1994, a two-story building was constructed in Terayama, Yoshino-Cho in the northern part of Kagoshima City. After completion, the base of observations and studies were shifted to this new site from the main Kagoshima University campus site at Korimoto.
This observatory sits in a quiet environment at a prime location for direct observation of volcanoes, as it commands a close view of Sakurajima volcano over Kagoshima Bay and the Kirishima volcanoes Kaimon volcano in the distance

Sakurajima volcano as viewed from the observatory.
In the distance, Kaimon volcano can be seen on the right, and the Kirishima volcanoes on the left.

The main areas of study is southern Kyushu and northern part of Nansei Islands (north of Tokunoshima in Nansei-Toko Island Arc from south of Kyushu to east of Taiwan). In this area earthquakes and volcanic activity are frequently observed due to the steep subduction of the Philippine Sea Plate and the expansion of the Okinawa Trough. Additionally, five large calderas (Aso, Kakuto, Aira, Ata, and Kikai) are linked within an area of merely 260 km. This is a very unique phenomenon that cannot be seen anywhere else on earth.
A large amount of thermal energy is needed to create such phenomena. However, the conventional plate tectonics framework known as plate movement of the earth's surface is difficult to account for such energy supply.
To solve this problem, it is necessary to create a new theory for earth's dynamics based on a global ideas in considering the deeper part of the earth. Understanding of tectonics in"Nansei-Toko" (Nansei islands) will contribute to the understanding of plate movement in the entire Pan-Pacific area. This will surely lead to further contribution to the basic research in earthquake and volcanic eruption prediction. Thus, "Nansei-Toko Island Arc" can be said to be an important field for the development of earth sciences.

Research

- Seismic activity is monitored using data obtained from more than 100 seismic stations and from ocean bottom seismometers deployed between southern Kyushu and the northern part of Nansei Islands (north of Tokunoshima). Observation and research of crustal deformation using GPS is also conducted. The research contributes to the understanding of stress fields and mechanisms of earthquakes.
- Study of dynamic phenomena such as earthquakes and ground deformations accompanied by volcanic activity have been performed in southern Kyushu and the Tokara islands. Researches are to broaden understanding of the fields and time sequences of the phenomena by improving observation accuracy. In addition, observations for analyzing the seismological and electromagnetic structure inside volcanic edifices were made in order to study the relationship between dynamic phenomena occurrence sites and background fields.

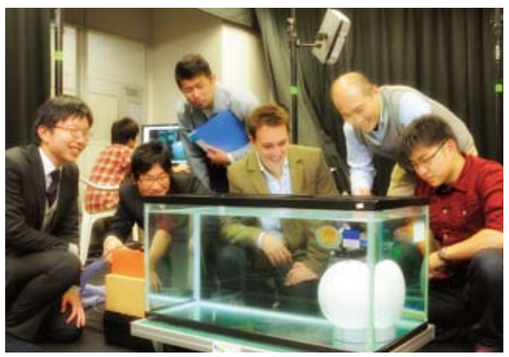
Affiliated Center

Regional Value Creation Center

The Regional Value Creation Center was established by Kagoshima University Graduate School of Science and Engineering (hereafter Graduate School of Science and Engineering) in order to support business and organizations in the Southern Kyushu region, as they take the initiative to raise their profiles. Our mission is to mobilize industry in the Southern Kyushu region, to generate innovation and value in regional enterprise, and to revitalize its potential for growth.

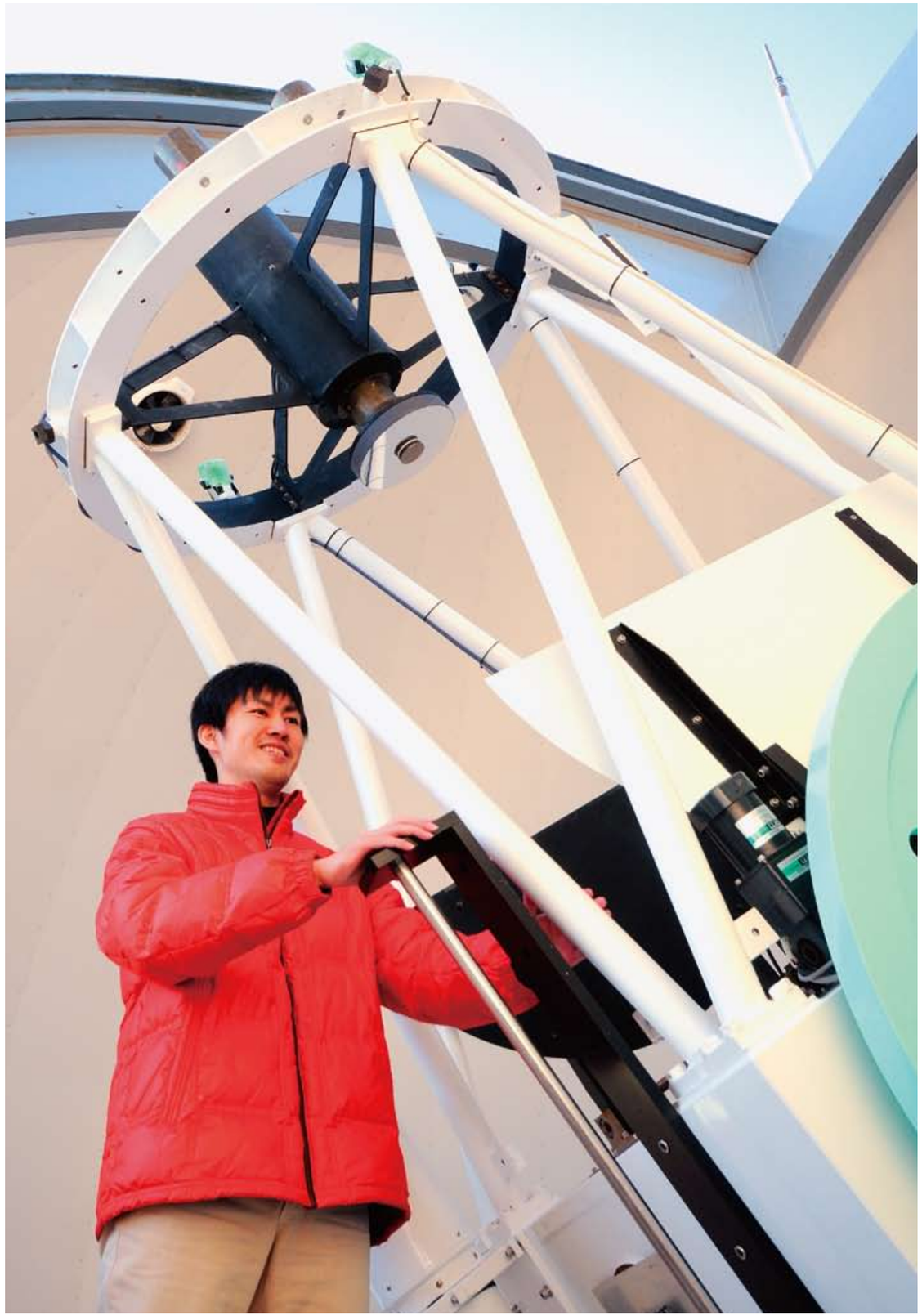
01.Innovation Creation

Our center has two main goals, the first of which is to contribute to the creation and development of regional enterprise, and to play a part in revitalizing and improving the competitiveness of local industry. Our second goal is to move ahead with the progressive reforms needed to support the development of innovative professionals.
In order to intensify the growth of regional industry, our center matches researchers from labs in the Graduate School of Science and Engineering with industry groups to develop projects that meet the needs of the region. This collaboration allows for the germination of new technology, resources and markets. The result of this matching process forms the foundation for new structures and organizations that can effectively advise and support regional initiatives.
These new structures in research, arising out of the aforementioned matching, create humanistic support for the professional development of the Graduate School of Science and Engineering's doctoral and post-doctoral students, research assistants and technicians. Through collaboration with groups outside the university, students and staff can see the direct connection between the results of their research, and its practical application in real-world situations. This valuable experience is essential to the professional development of all those involved with the Regional Value Creation Center.



02.Regional Revitalization

The Regional Value Creation Center does not only act to coordinate industrial,academic and governmental collaboration. Once the matching process is over, our center continues to provide support in terms of assistance with funding applications and sponsorship information. Only once the project expectations are fulfilled will the support structure be removed.
By working together, we can all contribute to regional revitalization in the Southern Kyushu region. Hand in hand with Kagoshima University Graduate School of Science and Engineering we can transmit what we discover at the regional level, first to the whole country, and from there, to the world. If you have an idea that you think will contribute to regional revitalization, please don't hesitate to contact the Regional Value Creation Center. We can help bring your idea to fruition.



List of faculty members of the Graduate School of Science and Engineering

The following specialists provide research and education support to students and help find solutions to student academic issues.

※Please add “kagoshima-u.ac.jp”to the end of the addresses listed below under “E-mail”.

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April 1. 2016