

Graduate School of Science and Engineering for Education

Master's Program
Application Guide for International Students
【Engineering Division】

October 2017 Enrollment

April 2018 Enrollment

June 2017

University of Toyama

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I

Graduate School of Science and Engineering for Education

Master's Program

Application Guide for International Students

【Engineering Division】

October 2017 Enrollment

Electric and Electronic Engineering

Intellectual Information Engineering

Mechanical and Intellectual Systems Engineering

Life Sciences and Bioengineering

Environmental Applied Chemistry

Materials Science and Engineering

Master's Degree Program Admission Policy

Graduate School of Science and Engineering for Education (Engineering Division)

Our six majors have the admission policies set below.

Electric and Electronic Engineering

- ◆ Students who have acquired a basic knowledge of electric and electronic systems engineering.
- ◆ Students who are highly motivated with a strong interest in the study of electric and electronic systems engineering.
- ◆ Students who have a strong desire to develop new technologies with the aim of creating a sustainable society.

Intellectual Information Engineering

- ◆ Students who have acquired a basic knowledge of information engineering, and have a great interest in learning and researching.
- ◆ Students who can accomplish academic research projects with continuous effort, through cooperation with others.
- ◆ Students who can comprehend and logically analyze issues in the field, clearly present them to others, and solve problems.
- ◆ Students who aim to contribute to society as professional engineers or researchers with sophisticated skills and a wide view.
- ◆ Students who have a desire to improve their communication skills in order to contribute to international society.

Mechanical and Intellectual Systems Engineering

- ◆ Students who have acquired a basic knowledge of mechanical engineering.
- ◆ Students who have clear objectives, high motivation to learn, and strong intellectual curiosity.
- ◆ Students who have abilities to find problems and systematically solve these problems.
- ◆ Students who have a profound interest in issues of the natural environment and the social implications of research on the development of human society.
- ◆ Students who have a desire to contribute to society as engineers and researchers.

Life Science and Bioengineering

- ◆ Students who have acquired a basic knowledge of life sciences and bioengineering with high study consciousness.
- ◆ Students who show strong enthusiasm for research through their active involvement.
- ◆ Students who have a desire to contribute to social development.

Environmental Applied Chemistry

- ◆ Students who intend to acquire the knowledge and technology skills of advanced chemistry and related fields.
- ◆ Students who are eager to contribute to the realization of a sustainable and environmentally harmonized society through craftsmanship.
- ◆ Students who will be engaged in the study of chemistry and the development of new functions for chemical materials.

Materials Science and Engineering

- ◆ Students who have acquired a basic knowledge of materials science and engineering, and have a strong interest and high motivation in studying related fields.
- ◆ Students who have acquired the abilities to think logically, understand deeply, identify problems, and work well with others for conducting research.
- ◆ Students who intend to acquire communication and presentation skills to make international contributions.
- ◆ Students who are eager to contribute to both local and global societies as professional engineers or scientists, possess high technical skills and broad perspectives, and develop deep interest and problem consciousness in the natural environment.

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1. Admission quota

Major	Admission quota
Electric and Electronic Engineering	A few
Intellectual Information Engineering	A few
Mechanical and Intellectual Systems Engineering	A few
Life Sciences and Bioengineering	A few
Environmental Applied Chemistry	A few
Materials Science and Engineering	A few

2. Eligibility requirements

Applicants must have non-Japanese citizenship and hold the residence status of ‘College Student’ at the time of admission as stipulated by the Immigration Control and Refugee Recognition Act, and meet one of the following qualifications. Those who are expected to obtain the residence status of ‘College Student’ may also apply.

- (1) Those who have graduated from a Japanese university, or are expected to graduate by September 30, 2017.
- (2) Those who have received, or are expected to receive a bachelor’s degree from a Japanese university by September 30, 2017 according to the provisions of Article 104, Paragraph 4, Section 1 of the School Education Law.
- (3) Those who have completed, or are expected to complete 16 years of education in foreign countries by September 30, 2017.
- (4) Those who live in Japan and completed, or are expected to complete 16 years of education in correspondence courses from a foreign-affiliated educational institution by September 30, 2017.
- (5) Those who have been designated by the Minister of Education, Culture, Sports, Science and Technology (Ministry of Education Notification No.5,1953).
- (6) Those who have completed, or are expected to complete 15 years of education outside Japan and who have been recognized by the Graduates School of Science and Engineering for Education, University of Toyama as having the prescribed credits with excellent academic results by September 30, 2017.
- (7) Those who are from counties where it does not take 16 years to graduate from university, and meet the following two conditions and have been recognized by the Graduates School of Science and Engineering for Education, University of Toyama as having academic abilities equivalent or superior to those of university graduates.
 - a) Those who, after completing university education, have been engaged or are expected to be engaged in research as research students or researchers for at least one year at university or research institutes equivalent to inter-university research institute by September 30, 2017.
 - b) Those who will reach the age of 22 by September 30, 2017.
- (8) Those who will reach the age of 22, and have been recognized by individual screening in the Graduates School of Science and Engineering for Education, University of Toyama as having academic abilities equivalent or superior to those of university graduates.

- (9) Those who have completed, or are expected to complete by September 30, 2017, a program of a foreign university or a foreign educational institution (limited to which its comprehensive progress of education and research have been evaluated by an external personnel certified by its government or its related agency, or an institution designated as equivalent by the Minister of MEXT) which requires more than three years to graduate and have been awarded a degree equivalent to a bachelor's degree.
- (10) Those who have completed, or are expected to complete by September 30, 2017, a foreign university program offered at an educational facility in Japan that recognized as having foreign educational system and designated by the Minister of Education, Culture, Sports, Science and Technology. (only for those who are recognized as completing a 16-years of education of that country.)
- (11) Those who have completed a specialized course at a specialized training college designated by the Minister of Education, Culture, Sports, Science and Technology, after the date stipulated by the Minister of Education, Culture, Sports, Science and Technology, after the date stipulated by the Minister of Education, Culture, Sports, Science and Technology. (The terms of study must be four years or more, and must meet the other criteria stipulated by the Minister of Education, Culture, Sports, Science and Technology.)

Note 1: If you have any questions about eligibility requirement (2), please contact us in advance.

Note 2: Please refer to page 7 for more information about the certification of case (6),(7),or (8).

3. Selection methods

- (1) Students eligible to enroll are selected based on the results of the academic ability assessment (written and oral) and submitted documents.
- (2) Academic ability will be determined by a written examination (Short Essay must be written in Japanese or English.) and an oral examination.
- (3) Examination date and location

Date	Item	Examination Subject	Time	Location	Remarks
August 29 (Tuesday), 2017	Arrival time		8:30	Faculty of Engineering University of Toyama (Gofuku campus)	
	Written examination	Short essay	9:00-10:30		
	Oral examination	Oral examination	From 13:30		

4. Application period

**All the application documents must be received
between July 24 (Monday) to July 28 (Friday), 2017.**

Applications brought in person will be accepted between 9am and 4pm during the application period.

Applications sent by mail must arrive by 4pm, on July 28 (Friday).

5. Application procedure

Please prepare the following documents and submit them to the address below by the deadline of submission. Please note that documents must be sent by registered mail and marked ‘Graduate school application form enclosed’ in red on the envelope.

Address: Administration Division, Faculty of Engineering (admissions office)
University of Toyama
3190 Gofuku, Toyama City, Toyama 930-8555, Japan
Tel: 076-445-6701 (Int'l calls: +81-76-445-6701)

Application documents

Documents		Outline
①	Application form (prescribed form)	Please fill out the necessary information.
②	Certificate of graduation (or expected graduation)	Please submit the original certificate issued by a school official. Those who have graduated, or are expected to graduate from the Faculty of Engineering of the University of Toyama do not need to submit.
③	Academic transcript(s)	The transcript(s) should be certified by a school official and be officially sealed in a school envelope.
④	Examinee ID card / Photo ID card (prescribed form)	Please use the designated form by the university. Fill out the necessary information and attach a photo of the applicant (H4cm×W3cm, upper body with no head covering, headshot taken within the last 3 months).
⑤	Envelope for return	This will be used for sending an admission card for examination. Please clearly state your name, address, and postal code on the envelope (23.5cm×12cm) and attach a 362-yen stamp to the envelope.
⑥	Certificate of Payment of Examination Fee	Examination fee: 30,000yen After making a bank transfer payment, please affix the certificate of payment issued by the bank to the “Certificate of Payment of Examination Fee”. (The applicant needs to pay a transfer fee separately.)
⑦	Mailing label (prescribed form)	Please fill out your postal code, address, and name in the form.
⑧	Certificate of approval for taking examination (free form)	If you are currently enrolled in the Master's programs of another university, or employed by a company or public office, please submit a letter from you manager / head of department giving approval for you to take the examination.
⑨	Statement of purpose (prescribed form)	Must be written by the applicant himself / herself.
⑩	Research plan (prescribed form)	Must be written in Japanese or English by the applicant himself / herself.

⑪	Copy of the certificate of residence	For a foreigner who currently lives in Japan, please submit a copy of the certificate of residence issued at the city hall of your residence. The document must clearly show your status of residence.
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Note:

- (1) Applicants who are eligible for requirement (2) in item 2, is required to submit the documents indicated separately (degree certificate, document certifying that you have applied to be awarded degree, etc.)
- (2) To make a request for application documents by mail, please enclose a return envelope (H33.2cm ×W24cm) clearly stating your name, address, and postal code with a 250-yen postage stamp affixed.

6. Payment of examination fee

Please pay the examination fee of 30,000 yen within the following period.

Between July 24 (Monday) to July 28 (Friday), 2017 (by 3:00pm)

Please pay the examination fee at the teller counter of a nearby financial institution (except for Japan Post Bank) that offers wire transfers using the “Request Form for Transfer” attached to this guideline. A separate transfer fee will be required. Transfer using an ATM is not accepted. Transfer cannot be made at a post office.

No refund of fees is given for any reason except in the following cases:

- ① The applicant paid the examination fee, but did not apply for admission to the University of Toyama (did not submit the application documents or the application documents were not accepted).
- ② The applicant paid the examination fee twice.
- ③ The applicant paid more than the designated examination amount.

Note:

IF you need to claim for a refund of the examination fee, please be sure to attach the “Certificate of Payment (Examination Fee)” to the “Request Refund Form” attached to this guideline and send it to the University of Toyama by mail.

Address: Accounting Division of Financial Affairs Department
University of Toyama
3190 Gofuku, Toyama City, Toyama 930-8555
TEL: (076)-445-6053

7. Approval of eligibility for application

For a person who applies based on the eligibility requirements (6), (7), or (8) in item 2, we will conduct a preliminary review. Please prepare the documents relating to the certification of eligibility qualifications in advance, and submit with necessary documents (academic transcripts, letter of recommendation, etc.) by the deadline below.

Application deadline: Must arrive by 4 pm on July 7(Friday), 2017.
Applications brought in person will be accepted between 9am and 4pm.
Applications sent by mail must arrive by 4 pm on July 7(Friday), 2017.

8. Announcement of successful applicants

Successful applicants' ID numbers will be posted at the Faculty of Engineering at 4 p.m. on September 8 (Friday), 2017 and the successful applicants will be notified individually.

The Faculty of Engineering will not accept any inquiries regarding the examination results by phone, fax, etc..

9. Admission procedures for successful applicants

The admission procedures are as follows. More details will be notified to each successful applicant.

(1) Deadline for admission procedures (October 2017 Enrollment)

Middle of September 2017 (subject to change)

(2) Expenses required for admission procedures

- ① Admission fee: 282,000yen (subject to change)

The above enrollment fee is the scheduled amount. If the admission fee is revised at the time of admission, a new admission fee will be applicable from the time of revision.

- ② Other expenses such as Personal Accident Insurance for Students Pursuing Education and Research will be required separately.

Note:

1. The tuition may be paid after admission. The exact amount of the fees and detailed method of payment will be explained at the time of the admission procedures. The tuition of academic year 2017 was 535,800 yen.

To cancel your admission to the University of Toyama, you must notify us in writing.

2. Individuals who have difficulty making payment of the admission fee and tuition fees due to financial problems or some other unavoidable circumstances, may apply for exemption or postponement of payment. Individuals may also apply for a scholarship loan from organizations such as the Japan Student Services Organization.

- (3) **Caution:** If you do not complete the admission procedures by the deadlines, you will be considered to have declined admission.

10. Policy on personal information protection

The personal information possessed by the University of Toyama shall be handled based on the “Act on the Protection of Personal Information Held by Independent Administrative Agencies, etc.” and “University of Toyama Personal Information Protection Policy”.

- (1) The names, addresses, and other personal information of applicants obtained through the application shall be used for ① admission and selection procedure, ② announcement of successful applicants, ③ admission procedure, ④ survey/study in the selection method of enrolled students, and ⑤ operations associated with these purposes.

- (2) Personal information obtained through the application, only of those who completed the admission procedure, shall be used for graduate school preparation programs prior to admission and/or post-admission operations related to ① academic affairs (school register, study guidance, etc.), ② student support (health care, application for tuition waiver/scholarship, career support), and ③ collection of tuition. ④ statistical survey and data analysis.

- (3) Only the applicant ID numbers, names and addresses of successful applicants may be used for contact with the

Alumni Association and Cooperative Association which are affiliated organizations. NOTE: If you do not wish to have any contact with these organizations, please inform our Administration Division, Faculty of Engineering (in charge of admission).

- (4) In the use of personal information for various types of operations, some of the operations may be conducted by a vendor contracted with the relevant operations from our university (hereinafter referred to as “contractor”). When contracting the operations, all or part of the personal information obtained shall be provided to the contractor within the limit necessary to perform the contracted operations. We supervise the use of information to ensure compliance with confidentiality.

11. IMPORTANT

- (1) Application may not be accepted if applicants fail to submit any of the required documents.
- (2) Application documents cannot be changed once they have been submitted.
- (3) Application documents will not be returned in any circumstances once they have been submitted.
- (4) Be sure to bring the examination admission card to the exam.
- (5) Applicants who do not take all the required examination will be automatically disqualified from the selection process.
- (6) Any information found to be incorrect at any stage will automatically lead to cancellation of the admission.
- (7) Please forward any inquiry about the application or other matters to the following address.

Address: Administration Division, Faculty of Engineering (admissions office)
University of Toyama
3190 Gofuku, Toyama City, Toyama 930-8555
Tel: 076-465-6701

12. Applicants with special needs

The University provides consultation for applicants with special needs who may require special arrangements during the entrance examinations or in classes after enrollment. Please contact our Administration Division, Faculty of Engineering prior to the application process.

Applicants with special needs may submit a medical certificate issued by a doctor and supporting documents specifying following information.

- Type(s) of disabilities, and the degree of severity
- Request for special arrangements required during the entrance examinations
- Request for special arrangements required in class
- Situation of daily life and other related information

- ① Consultation deadline: July 7 (Friday), 2017
- ② Contact: Administration Division, Faculty of Engineering (admissions office)
University of Toyama
3190 Gofuku, Toyama City, Toyama 930-8555
TEL: 076-445-6701

Master's Programs of Graduate School of Science and Engineering for Education 【Engineering Division】

1 Major Overview

(1) Electric and Electronic Engineering

The Master's Program in Electric and Electronic Engineering is composed of three divisions: (1) Electric Systems Engineering, (2) Communication and Control Engineering, and (3) Electronic Materials and Device Engineering. The curriculum covers a wide range of topics on electric and electronic engineering. Research topics include the generation and control of electric energy, communication and control engineering, development of new electronic materials and devices, and computer simulation. The latest trends in electric and electronic engineering, such as communication and broadcasting, assistive robotics for aging societies, nano- and bioelectronics, and neuroscience, are also part of our research. The mission of the Master's Program in Electric and Electronic Engineering is to provide students with an advanced education and research opportunities, thereby preparing future engineers to address new challenges. The Master's Program will increase your employment prospects in leading companies in the fields of electric, mechanical, and chemical engineering.

Educational field	Overview	Specialized subjects
Electric Power System Engineering	Based on high-voltage and plasma engineering, we conduct education and research on pulsed-power technology and its application to high-power pulsed beams and high-energy plasmas for inertial fusion and materials processing, atmospheric and laser-produced plasmas for environmental and biological treatments, lightning discharge observations, and emission spectroscopy of multiply charged heavy ions for short-wavelength light sources.	Advanced Electric Power Engineering 1
Intelligent Power System Engineering	We conduct education and research about advanced analytical techniques required for the secure operation and planning of future electric power systems. Recent interests have included the investigation of the effect of renewable energy sources (RESs) on the power system operations and stability and the development of countermeasures for the integration of RESs while maintaining secure power system operation.	Advanced Electric Power Engineering 2 Advanced Electric Power Engineering 3
Energy Conversion Engineering	We conduct education and research on applied electromagnetic technologies such as magnetic levitation, magnetic bearings, linear motors and actuators, and power electronics technologies, which are indispensable for natural energy generation and high-efficiency power conversion in the interconversion of electrical energy and mechanical energy.	Advanced Energy Conversion 1 Advanced Energy Conversion 2
Intelligent Robotics Engineering	We conduct education and research on topics such as robotic systems, autonomous mobile robots, biorobotics, rehabilitation robotics, intelligent control, and soft computing.	Advanced Theory of Robot Control 1 Advanced Theory of Robot Control 2

Educational field	Overview	Specialized subjects
Wave Communication Engineering	Education and research on communication engineering, focused on the properties of waves and their propagation, are conducted. The main research topics are 1) sound technologies for ultra-realistic communication including sound pick up, coding, transmission, and reproduction, and 2) computer simulation of electromagnetic wave propagation for the prediction of earthquakes.	Selected Topics in Wave Communication Engineering 1 Selected Topics in Wave Communication Engineering 2
Communication Systems Engineering	We conduct education and research on the advanced utilization of computers and the development of new frequency resources and communication systems, such as electromagnetic field analysis, signal processing, network connection techniques, and millimeter-wave and terahertz engineering.	Advanced Communication Systems 1 Advanced Communication Systems 2
Bio-Information Engineering	We conduct education and research in a wide range of bio-information systems, such as the methods of analyzing and measuring biological information and the development of health-care devices, considering both hardware and software, which are based on measurement, control, information processing, and system engineering.	Advanced Biological Systems 1 Advanced Biological Systems 2
Measurement Systems Engineering	We conduct education and research on small and integrated measurement systems developed using advanced technologies in biotechnology and electronics, such as integrated miniature biosensors, biochips, and microarrayed chips for medical diagnostics and environmental monitors.	Measurement Systems 1 Measurement Systems 2
Nanoelectronics Engineering	We study semiconductor nanodevices, micro mechanical electrical systems (MEMS), and their applications. Resonant tunneling devices and terahertz integrated circuits based on them are among the most active research subjects. We also study fabrication processes, epitaxial crystal growth, and characterization technologies for semiconductor devices in order to realize next-generation high-performance integrated circuits.	Advanced Solid State Electronics 1 Advanced Solid State Electronics 2
Electron Device Engineering	We conduct education and research in the physics and electro-optical properties of organic materials, the basic science and technology of electron devices and displays, and their applications, e.g., in liquid crystal devices, organic light-emitting devices, organic-based transistors, organic sensing devices, organic-based solar cells, and novel multi-functional devices.	Advanced Electronic Devices 1 Advanced Electronic Devices 2

Educational field	Overview	Specialized subjects
Basic Material Engineering	Education and research of the structure, physical property, and application of single crystals, thin films, and nanomaterials of semiconductors and ferroelectrics are conducted. In particular, gas sensors made of oxide semiconductor nanomaterials formed by sputtering or thermal vapor deposition are studied. Electric property and atomic structure of ferroelectric single crystals grown in aqueous solution are also investigated.	Fundamental Material Engineering 1 Fundamental Material Engineering 2

(2) Intellectual Information Engineering

We offer education and perform research on information and communication technologies, including software, hardware, communication, internet, multimedia, artificial intelligence, medical applications, and quantum information. The education and research of our division also address the science of recognition, human senses, and sensibility, such as vision and hearing, computation of the brain and nerves, and technology for building a ubiquitous society.

Educational field	Overview	Specialized subjects
Computer Software System	We conduct education and research on digital signal processing and its applications. Signals of interest include audio, imaging, economics, finance, cosmic rays, biological signal, and, many others. The processing of such signals includes denoising, compression, visualization techniques, and brain-computer interfaces.	Advanced System Engineering 1 Advanced System Engineering 2
Medical Information Sensing	We conduct education and research on the sensing of morphological and functional information of biological bodies for biomedical applications. In particular, we develop signal- and image-processing techniques for ultrasonic measurements. We also conduct education and research on pattern recognition and its applications, such as image analysis, character recognition, person finding, person identification, object recognition, vehicle safety tasks, and industrial inspections.	Advanced Pattern Information Processing Advanced Medical Information Sensing 1
Media Information Communication Technology	We conduct education and research on media information communication technology. Our aims are to elucidate the basis of the quality of experience for visual media using signal processing techniques. We also work to develop intelligent transport system applications.	Advanced Media Information Communication 1 Advanced Media Information Communication 2 Advanced Media Information Communication 3

Educational field	Overview	Specialized subjects
Simulation Engineering	We conduct education and research on simulations of physical processes by computational means. Our aim is to develop software to confirm the performance and quality of industrial products, driving and traffic simulators, and educational gaming software. We also perform particle simulations for plasmas.	Advanced Simulation Engineering 1 Advanced Simulation Engineering 2
Visual Information Processing Engineering	We conduct education and research on visual information processing engineering, color engineering, evaluation and analysis of CG/3-D visible images, optical and visual environment engineering, traffic visual environment engineering, urban landscape lighting, and the development of universal designs for elderly persons and people with synesthesia.	Advanced Visual Information Processing
Neural Information Technology	We conduct education and research in bioinformatics. We investigate the relationship between gene sequence, protein structure and function, neural/cardiac function, behavior, disease using computer protein structure modeling, in-silico pathogenicity prediction, and electrophysiological and behavioral measurements.	Advanced Medical Information Sensing 2
Information Communication Networks	We conduct education and research on optical signal processing, transmission systems for the signals of emergency events such as earthquakes, modulation systems, transmission systems, optical communication systems, information communication networks, communication quality, and solitons.	Advanced Communication Theory 1 Advanced Communication Theory 2
Artificial Intelligence	We conduct education and research on the design, analysis, and evaluation of various artificial intelligent methodologies, including the artificial neural networks which are inspired by the human brain's architecture and information processing mechanisms, the deep learning which is able to learn by itself, particle swarm optimization, ant colony optimization, error back-propagation method, genetic algorithm, evolutionary strategy, and other machine learning technologies.	Advanced Artificial Intelligence 1 Advanced Artificial Intelligence 2
Quantum Information	We are working on quantum information where application of quantum mechanics offers revolutionary improvements to information processing. In particular, we are aiming at the realization of quantum communication, such as quantum key distribution and quantum repeaters. We also apply Shannon's classical information theory to modern sensing and communications issues.	Modern Statistical Sciences Quantum Information Processing

(3) Mechanical and Intellectual Systems Engineering

In this department, research is focused on the global topics of energy conservation, environmental load reduction, and the realization of a safe, secure, and comfortable society infrastructure. This includes ongoing research on the structure and performance of machinery and its efficiency, the development of consistent production systems with optimized cycles from design to value-added machinery with improved reliability. The field involves experimental and numerical analyses of a range of fluid mechanics phenomena from high-efficiency energy conversion to its effective utilization, as well as the analysis of combined heat and fluid phenomena with the aim of producing low-energy-loss machinery from the micro-to macro-scale. Education and research are also conducted on the strength evaluation and analysis of physical phenomena related to high machine intelligence, the development of micro-scale mechanisms, design of control systems, non-destructive measurement technologies, and computing and simulation technologies.

Educational field	Overview	Specialized subjects
Solid Mechanics	We focus on mechanical structures under complex physical conditions. Their behaviors are linked to stresses, displacements, and fracture thresholds of the structures. We conduct education and research based on the quantitative evaluation of the fracture process and the investigation of fracture mechanisms using experimental methods, observations, and numerical analysis.	Advanced Physics of Elasticity Advanced Physics of Plasticity
Strength and Fracture of Materials	Based on theory that combines micro- and macro-scale approaches to the strength and fracture mechanisms of machinery, education and research on reliability design methods is conducted for structural and functional materials, including new materials. The construction of a database on strength design is performed together with the development of environmental strength design methods.	Advanced Strength Design Engineering Advanced Element Design Engineering
Advanced Materials and Forming	We conduct education and research on the optimal design and applications of machining tools, based on improving the required plasticity characteristics and working processes of various structural and functional materials, involving the control of materials compositions and the analysis of plastic deformation.	Advanced Mechanical Material Processing Advanced Technology of Plasticity
Thermal Engineering	We conduct education and research on the basics and applications of thermal energy, concentrating on micro- and macro-scale thermodynamics, heat engine engineering, and understanding the combustion process in terms of its application. The thermal physical properties of various materials are measured and analyzed and mathematical analyses of heat conduction are performed. In applications to the global environment, heat transfer phenomena with phase changes, latent heat storage, and energy utilization from natural sources are studied.	Advanced Technical Thermodynamics Advanced Heat Transfer Engineering

Educational field	Overview	Specialized subjects
Fluid Engineering	We conduct education and research on fluid flow and the micro- or macro- structures of turbulence formed in the internal flow around various objects in fluid devices, aiming to elucidate and reduce turbulence associated with energy transfer for technological applications. We also investigate by experimental and numerical analysis the unsteady flow phenomena in aerodynamic noise.	Advanced Fluid Engineering Advanced Fluid Dynamics
Intelligent Machine	For the development of advanced mechatronics intended to create high-precision, high-speed, high-response machinery, we conduct education and research on dynamical analysis and the configuration and design of new mechanical systems.	Advanced Dynamics of Mechanical Systems Advanced Robotics
Control System	We conduct education and research on development of control systems such as human cooperation robot systems considering human emotion, visual servo systems based on image processing technology, and swarm systems using evolution and learning approaches.	Advanced Control Interfaces Advanced Control Equipment
Mechanical Information and Instrumentation	Our aim is image-position measuring of large-scale environments and force sensing for micro-handling. We conduct education and research on the development of new measuring methods, systems, and sensors.	Advanced Measurement Systems Advanced Image Measurement Systems
Applied Mechano-Informatics	We conduct education and research on numerical analysis and simulation technology utilizing computers, addressing mechanical engineering problems based on the control of physical phenomena, ranging from the micro-scale level of elucidating molecular and atomic mechanisms to macro-scale levels such as analyzing aircraft aerodynamics.	Advanced Computational Mechanics Advanced Nano-mechanical Systems Advanced Mathematical and Numerical Analysis for Environment

(4) Life Sciences and Bioengineering

The development of technology for human health care and for promoting happy human living is an important endeavor for science, anytime and anywhere in the world. Issues such as overcoming incurable diseases, including cancers, or aiding in the treatment of brain dysfunctions and physical disabilities due to aging or disease are the areas to which science is expected to contribute the most in the 21st century. The University of Toyama Department of Life Science and Bioengineering endeavors to clarify bio-functional and pathophysiological phenomena from the molecular, genetic, protein, and cellular levels to the biological system level. This will be done in collaboration with and through the application of expertise and technology from related scientific fields such as organic synthesis, genetic engineering, bioelectrical and bioelectronic engineering, biomaterials engineering, behavioral pharmacology, regenerative medicine and engineering, and biochemical process science. The department also seeks to develop useful medical products, to create and produce bio-functional materials, to design new analytical tools and bio-medical equipment, and finally, to create production apparatus or large-scale processing plants in order to supply the materials we develop to society. The Department of Life Science and Bioengineering conducts education and research regarding the manufacture of products that support the life and medical sciences and contribute to

their progress, thus providing human resource development that enables graduates to succeed as engineering specialists in both the life and medical sciences.

Educational field	Overview	Specialized subjects
Engineering based on Genetic Information	We conduct education and research to understand the molecular bases of human diseases from molecular-genetic and immunological viewpoints. We apply this knowledge to the development of biotechnology.	Advanced Molecular Biology Advanced Radiation Bioengineering
Pharmacology	Our aim is to provide researchers and engineers with the knowledge and technology of pharmacology and genetic engineering. Our research group aims to elucidate the mechanisms of chronic pain and neuropsychiatric disorders and develop new medications against them.	Advanced Pharmacology and Genetic Engineering
Biological Chemistry	We investigate the relationship between the metabolism of a drug or toxin and the expression of drug efficacy or toxicity, the purification of metabolic enzymes, the conversion of environmental pollutants to useful materials using enzymes or microorganisms, and the application of enzymes to organic syntheses and analytical chemistry.	Advanced Metabolic Engineering
Bioelectronics and Bioelectrical Engineering	Research and education concerning the interdisciplinary region between bioscience and electrochemical or electrical engineering are conducted. Enzyme sensors and cell-based biosensors for medical diagnostics and pharmaceutical tests are studied. Basic and applied research of various electrical treatments of microorganisms and mammalian cells are also studied.	Advanced Bioinformation Engineering
Brain and Neural Systems Engineering	From a biophysical view, we research the rules underlying the functions of the brain and neural system and utilize these rules for engineering applications. Focusing on the mechanisms of learning and memory, we investigate network dynamics using neural recording and pharmacological techniques and conduct education and research on engineering applications of neural network dynamics.	Advanced Neural Systems
Tissue Engineering and Regenerative Medicine	We have developed bioprinting and biofabrication methodologies to construct complicated 3D tissues. We aim to develop additional innovative multi-scale processing engineering methods, using biomaterial, biofabrication, and industrial technologies, for next-generation engineering of tissues and organs as well as for regenerative medicine. We explore multi-disciplinary approaches to generate tissue and organ models for basic investigations of molecular/cell/tissue biology and therapeutic biomedical research.	Advanced Biomedical Engineering

Educational field	Overview	Specialized subjects
Bio-functional Molecule Engineering	The principal focus of this group is the development of the design and synthesis procedure of small molecules, as well as their biological evaluation as candidates in drug discovery.	Advanced Synthetic Organic Chemistry
Biomaterial Engineering	Using the self-organizing mechanism essential to organisms, this major conducts educational research on biomaterial engineering for the design of biocompatible medical materials and the application of the mechanism to functional material synthesis processes.	Advanced Biomaterial Engineering
Biochemical Reaction Engineering	We conduct education and research on the understanding of metabolic mechanisms, the biochemical reaction functions of biocatalysts such as microorganisms, plants, and animals and the industrial production of useful metabolites and biochemicals for human life.	Advanced Biochemical Reaction Engineering
Process Systems Engineering	We conduct education and research on process systems engineering, which addresses the optimal design, operation, and control of complex systems, such as chemical, biochemical, petrochemical, and pharmaceutical processes.	Advanced Process Systems Engineering
Protein System Engineering	Proteins are necessary for virtually every activity in the human body. Our goal is to understand how proteins are produced and degraded in the cell in terms of protein science and biophysics. Based on the above knowledge, we also aim to develop novel technologies that can regulate the lifespans of proteins for various practical applications.	Advanced Protein System Engineering

(5) Environmental Applied Chemistry

Chemistry is an academic discipline that aims to create and design new materials and systems based on chemical reactions and elucidate the properties of these materials from atomic and molecular perspectives. Applied chemistry is an academic field derived from chemistry that aims to produce new technologies. A broad range of chemical education and research related to physics and biology is conducted in this major to cultivate human resources capable of creating new functional materials and the technology to produce these materials. The research subjects listed below cover a wide range of chemistry specialties, including the syntheses of highly functional materials and molecules and the elucidation of their reaction mechanisms, development of complicated biofunctions and elucidation of their mechanisms, environmental assessment of chemical materials, and novel energy science.

Educational field	Overview	Specialized subjects
Catalysis, Energy and Material Engineering	We research the development of environmentally friendly catalysis processes, the green utilization of natural resources including biomass and sunlight, the development of alternative energy instead of petroleum, and novel nanomaterials.	Catalysis and Surface Science Industrial Organic Chemistry

Educational field	Overview	Specialized subjects
Environmental and Functional Molecular Chemistry	Education and research are conducted on the following: 1) synthesis of materials containing functional molecules and polymers, 2) establishment of techniques using these materials for separation and preconcentration of elements, and 3) application of the techniques to environmental analysis, treatment of wastewater, and recovery of rare elements. Research on the adsorption and desorption behaviors of materials at the solid-liquid interface, including the development of surface modification techniques and antifouling materials, is also conducted.	Advanced Environmental Analytical Chemistry Advanced Interfacial Analytical Chemistry
Applied Inorganic Chemistry	Physiological and pharmacological studies have revealed the sophisticated functions of metal complexes, which may be related to their atomic structures and electronic states. From the perspective of the engineering applications of such functions, education and research are performed to develop highly functionalized materials and chemicals produced with metal complexes and their aggregates.	Reaction of Coordination Compounds Advanced Crystallography for Molecular Solid State Materials
Computers and Applied Chemistry	The recent rapid development of computer technology has enabled us to analyze and predict various chemical reactions and molecular dynamics based on computational chemistry. This class summarizes the basic theory of ab initio electronic structure calculations, such as molecular orbital and density functional methods.	Advanced Computational Molecular Science
Biomolecular Chemistry	Organic chemistry has been vigorously applied to molecular biology. Our objectives are to reveal the properties of biomolecules using various methods based on chemical biology. We also engage in the development of new techniques for the analysis of intermolecular interactions, such as protein-protein interactions.	Biochemical Engineering
Synthetic and Medicinal Chemistry	This field focuses on creation of novel “functional organic molecules” based on the advanced synthetic organic chemistry. The newly designed organic molecules possess some potential to contribute to various fields of science such as discovery of novel medicines and agrichemicals. Research in our group is primarily aimed toward the development of catalytic reactions and methods for organic synthesis for the functional organic molecules.	Advanced Synthetic Chemistry for Drug Discovery Advanced Organic Reaction
Environmental Analytical Chemistry	We conduct educational research on the design and synthesis of highly functional optical sensor molecules for the sensing of metabolites, such as glucose or lactate, and ions, such as potassium or sodium, in the human body, and the application of such molecules to a novel optical sensing system for the minimally invasive monitoring of vital ions and metabolites as a tool for biochemical and clinical analyses.	Advanced Electroanalytical Chemistry

Educational field	Overview	Specialized subjects
Colloid and Interface Chemistry	We focus on teaching the basic theory on the interfaces that form common boundaries between two phases, such as gas/liquid, liquid/solid, and solid/gas. Basic studies investigating unknown phenomena in dispersions of nanometer- to micrometer-sized particles and applied research in the development of new optical materials and porous materials are conducted.	Colloid and Interface Chemistry
Biomaterial Designing and Engineering	Education and research are conducted on the design of biomaterials for contributing to regenerative medicine, based on protein engineering, polymer science, cell biology, and molecular biology. We aim to construct functional biomaterials such as screening devices for various diseases and supporting materials for cell transplantation to cure otherwise intractable disorders.	Biomaterial Engineering and Biomedical Science

(6) Materials Science and Engineering

Our purpose for education in the acquisition of extensive knowledge and the improvement of problem-solving abilities for society through educational research from fundamentals to the advanced development of new functional materials.

Educational field	Overview	Specialized subjects
Materials Forming and Engineering	We conduct education and research related to the processing and design of fabricated materials based on the phase transition from liquid to solid, through the development and application of melting, casting, and solidification techniques of metal and the forming of materials, to produce high-performance and high-function fabricated materials.	Materials Forming and Engineering
Microstructure Control Engineering	The microstructure control engineering course is focused on establishing and designing new metallic materials for energy saving and environmental conservation. Research topics also include advanced microstructure control technologies using high-resolution transmission electron microscopy and scanning electron microscopy.	Materials Science for Controlling of Micro- and Nanostructures in Metals and Materials
Functional Material Design Engineering	Education and synthetic research and development are conducted on the functional materials of ceramics, metals, and new complex materials through designing, structural control, combining additives such as rare earth metals, improving fabrication processes, and evaluating their properties and applications.	Functional Material Design Engineering

Educational field	Overview	Specialized subjects
Materials Environment and Surface Processing	In order to improve the corrosion resistance of metal materials, we investigate and instruct about electrochemical methods in various alloys. We focus especially on the characterization of passivation films and functional films that are fabricated by electrochemical methods.	Materials Environment and Surface Engineering
Solid State Engineering	We conduct education and research on the electric, magnetic, and thermal properties of superconductors, magnetic materials, and cryogenic materials of alloys, intermetallic compounds, and conductive oxides to achieve improved performance and applications of the materials.	Solid State Engineering
Materials Processing Engineering	Targets of education and research in this laboratory are the key fundamental processes for industrial products, starting from the designing of materials addressing the control of phenomena in materials through elucidating their mechanisms, and optimizing their related production processes. The main subjects are 1)heat and mass transfer phenomena, 2)visualization techniques, 3)surfaces and interfaces, and 4)joining and welding.	Advanced Course of Materials Process Engineering
Surface Coatings and Engineering	This laboratory is managed for education and research of surface coating technologies. We focus on improvements or new additions to various properties such as the mechanical, electrical, or optical properties of materials by the addition of hard coatings of oxide, nitride, coatings of oxide, nitride, and carbide films and/or nano-composite films thereof on the surface of metal or inorganic materials, or by the deposition of functional films.	Advanced Course of Surface Modification and Engineering I Advanced Course of Surface Modification and Engineering II
Engineering for Reaction Design	We conduct education and research related to the design of reactions for the highly effective conversion and utilization of petroleum-derived materials from engineering perspective.	Reaction Design and Engineering

2. Supervisors and Educational field

Major	Educational field	Supervisors	Remarks
Electric and Electronic Engineering	Electric Power System Engineering	Prof. Hiroaki Ito Lecturer Hayato Ohashi	
	Intelligent Power System Engineering	Prof. Kazuyuki Tanaka	
	Energy Conversion Engineering	Prof. Takahisa Ohji Associate Prof. Kenji Amei	
	Intelligent Robotics Engineering	Associate Prof. Hideki Toda	
	Wave Communication Engineering	Prof. Akio Ando Associate Prof. Masafumi Fujii	
	Communication Systems Engineering	Prof. Koichi Ogawa Associate Prof. Tatsuo Nozokido Lecturer Kazuhiro Honda	
	Bio-Information Engineering	Prof. Kazuki Nakajima Lecturer Juhyon Kim	
	Measurement Systems Engineering	Prof. Masayasu Suzuki	
	Nanoelectronics Engineering	Prof. Koichi Maezawa Associate Prof. Masayuki Mori	
	Electron Device Engineering	Prof. Hiroyuki Okada Prof. Shigeki Naka	
	Basic Material Engineering	Associate Prof. Toshinari Yamazaki (※1) Associate Prof. Toshio Kikuta	
Intellectual Information Engineering	Computer Software System	Prof. Shigeki Hirobayashi Associate Prof. Tadanobu Misawa	
	Medical Information Sensing	Prof. Hideyuki Hasegawa Associate Prof. Mitsuru Sakai	
	Media Information Communication Technology	Prof. Yuukou Horita Lecturer Yasuhiro Inazumi Lecturer Keiji Shibata	
	Simulation Engineering	Prof. Masahiro Sato Lecturer Takayuki Haruki	
	Visual Information Processing Engineering	Associate Prof. Mamoru Takamatsu	
	Neural Information Technology	Associate Prof. Toshihide Tabata	
	Information Communication Networks	Prof. Koji Kikushima Lecturer Hiroshi Kakuhata	
	Artificial Intelligence	Prof. Zheng Tang Associate Prof. Shangce Gao	
	Quantum Information	Prof. Kiyoshi Tamaki Lecturer Tatsuto Murayama	
Mechanical and Intellectual Systems Engineering	Solid Mechanics	Prof. Katsuyuki Kida Lecturer Kenichi Masuda	
	Strength and Fracture of Materials	Prof. Noriyasu Oguma Associate Prof. Koichi Kasaba	
	Advanced Materials and Forming	Prof. Norio Takatsuji(※2) Associate Prof. Tetsuo Aida	
	Thermal Engineering	Prof. Atsumu Tezaki Prof. Yoshio Hirasawa(※2)	
	Fluid Engineering	Prof. Kiyoshi Kawaguchi Lecturer Daisuke Watanabe	
	Intelligent Machine	Prof. Hiroyuki Kimura Lecturer Masahiro Sekimoto	
	Control System	Prof. Mitsuru Jindai Associate Prof. Toshiyuki Yasuda	

Major	Educational field	Supervisors	Remarks
Mechanical and Intellectual Systems Engineering	Mechanical Information and Instrumentation	Prof. Tohru Sasaki Associate Prof. Kenji Terabayashi	
	Applied Mechano-Informatics	Prof. Kisa Matsushima(※2) Associate Prof. Takeshi Seta Lecturer Tatiana N. Zolotoukhina	
Life Sciences and Bioengineering	Engineering based on Genetic Information	Prof. Masaharu Isobe Prof. Nobuyuki Kurosawa	
	Pharmacology	Associate Prof. Ichiro Takasaki	
	Biological Chemistry	Lecturer Michio Sayama	☆
	Bioelectronics and Bioelectrical Engineering	Prof. Hiroaki Shinohara	
	Brain and Neural Systems Engineering	Prof. Shigenori Kawahara	
	Tissue Engineering and Regenerative Medicine	Prof. Makoto Nakamura	
	Bio-functional Molecule Engineering	Prof. Naoki Toyooka	
	Biomaterial Engineering	Prof. Hidetoshi Mori (※1)	
	Biochemical Reaction Engineering	Associate Prof. Kazuhiro Hoshino	
	Process Systems Engineering	Associate Prof. Taketoshi Kurooka	
Environmental Applied Chemistry	Protein System Engineering	Associate Prof. Tomonao Inobe	
	Catalysis, Energy and Material Engineering	Prof. Noritatsu Tsubaki Associate Prof. Yoshiharu Yoneyama	
	Environmental and Functional Molecular Chemistry	Prof. Shigehiro Kagaya Associate Prof. Makoto Gemmei	
	Applied Inorganic Chemistry	Prof. Senichi Aizawa Associate Prof. Akira Miyazaki	
	Computers and Applied Chemistry	Associate Prof. Tatsuya Ishiyama	
	Biomolecular Chemistry	Associate Prof. Masafumi Sakono	
	Synthetic and Medicinal Chemistry	Prof. Hitoshi Abe Associate Prof. Yoshikazu Horino	
	Environmental Analytical Chemistry	Prof. Koji Tohda	
	Colloid and Interface Chemistry	Associate Prof. Kensaku Ito	☆
Materials Science and Engineering	Biomaterial Designing and Engineering	Associate Prof. Tadashi Nakaji	
	Materials Forming and Engineering	Prof. Seiji Saikawa	
	Microstructure Control Engineering	Prof. Kenji Matsuda Associate Prof. Seungwon Lee	
	Functional Material Design Engineering	Prof. Atsushi Saiki	
	Materials Environment and Surface Processing	Prof. Satoshi Sunada Associate Prof. Masahiko Hatakeyama	
	Solid State Engineering	Prof. Katsuhiko Nishimura Associate Prof. Takahiro Namiki	
	Materials Processing Engineering Laboratory	Prof. Toshiya Shibayanagi Associate Prof. Masamichi Yoshida	
	Surface Coatings and Engineering	[UNDECIDED]	☆
Engineering for Reaction Design	Prof. Satoru Murata	☆	

(Notes)

1. The “field of education” filled in on the application form etc. should be chosen from this list.
2. We are not inviting applicants for the 2017 academic year for the fields of education marked with a star (☆) in the “Remarks” column.
3. The staff marked ※1 are due to retire in March 2018. The staff marked ※2 are due to retire in March 2019.
4. If you have any questions, please contact the person in charge of admissions at the Administration Department of the Faculty of Engineering of this University.

3. Degree Requirements and Completion

A master's degree will be conferred to those who have attended our graduate school for at least two years, earned more than 30 credits of compulsory subjects specified by each major, and passed the thesis review and final examinations. However, the term of residence may be reduced to a minimum of one year for those students who have showed excellent research performance.

4. Long-term Curriculum Program

A long-term curriculum program is a program intended for those who cannot complete the curriculum under the standard course term because the curriculum hours for classes and research instruction are limited due to reasons such as they are working (full-time) and they intend to complete educational courses in a planned manner during a certain period longer than the standard course term. In our Master's program, the student's school days are accepted up to a total of 4 years. If permitted at the time of admission, the total amount of tuition to be paid in the standard course term(2 years) can be paid evenly for each school term during the period accepted as a long-term curriculum period.

Note:

1. Details, including the method of application for this program, shall be notified to applicants when the documents for admission procedures are sent.
2. Please note that not every applicant is necessarily permitted to enter this program.

5. Courses and Credits

Major	Subjects (○ : Compulsory Subjects)	Credits
Electric and Electronic Engineering	Advanced Electric Power Engineering 1	2
	Advanced Electric Power Engineering 2	2
	Advanced Electric Power Engineering 3	2
	Advanced Energy Conversion 1	2
	Advanced Energy Conversion 2	2
	Advanced Theory of Robot Control 1	2
	Advanced Theory of Robot Control 2	2
	Selected Topics in Wave Communication Engineering 1	2
	Selected Topics in Wave Communication Engineering 2	2
	Advanced Communication Systems 1	2
	Advanced Communication Systems 2	2
	Advanced Biological Systems 1	2
	Advanced Biological Systems 2	2
	Measurement Systems 1	2
	Measurement Systems 2	2
	Advanced Solid State Electronics 1	2
	Advanced Solid State Electronics 2	2
	Advanced Electronic Devices 1	2
Advanced Electronic Devices 2	2	

Major	Subjects (○ : Compulsory Subjects)	Credits
Electric and Electronic Engineering	Fundamental Material Engineering 1	2
	Fundamental Material Engineering 2	2
	Special Lecture	4
	○Advanced Exercises for Creative Designing toward Problem Solving	1
	○Advanced Exercises in Electric and Electronic Engineering	3
	○Special Study of Electric and Electronic Engineering	10
	Internship I	1
	Internship II	2
	Cooperative and Interactive Internship Program for Creation	2
	Advanced Lecture for Intellectual Property	2
	Professional Education Lecture	4
Intellectual Information Engineering	Advanced System Engineering 1	2
	Advanced System Engineering 2	2
	Advanced Pattern Information Processing	2
	Advanced Media Information Communication 1	2
	Advanced Media Information Communication 2	2
	Advanced Media Information Communication 3	2
	Advanced Simulation Engineering 1	2
	Advanced Simulation Engineering 2	2
	Advanced Visual Information Processing	2
	Advanced Medical Information Sensing 1	2
	Advanced Medical Information Sensing 2	2
	Advanced Communication Theory 1	2
	Advanced Communication Theory 2	2
	Advanced Artificial Intelligence 1	2
	Advanced Artificial Intelligence 2	2
	Modern Statistical Sciences	2
	Outline of Electronics & Information Engineering	2
	Advanced Algorithms	2
	Quantum Information Processing	2
	Special Lecture	4
	○Advanced Exercises in Intellectual Information Engineering	3
	○Advanced Exercises for Creative Designing toward Problem Solving	1
	○Special Study of Intellectual Information Engineering	10
	Internship I	1
	Internship II	2

Major	Subjects (○ : Compulsory Subjects)	Credits
Intellectual Information Engineering	Cooperative and Interactive Internship Program for Creation	2
	Advanced Lecture for Intellectual Property	2
	Professional Education Lecture	4
Mechanical and Intellectual Systems Engineering	Advanced Physics of Elasticity	2
	Advanced Physics of Plasticity	2
	Advanced Strength Design Engineering	2
	Advanced Element Design Engineering	2
	Advanced Precision Machining	2
	Advanced Metal Machining Processes	2
	Advanced Mechanical Material Processing	2
	Advanced Technology of Plasticity	2
	Advanced Technical Thermodynamics	2
	Advanced Heat Transfer Engineering	2
	Advanced Fluid Engineering	2
	Advanced Fluid Dynamics	2
	Advanced Mathematical and Numerical Analysis for Environment	2
	Advanced Dynamics of Mechanical Systems	2
	Advanced Robotics	2
	Advanced Control Interfaces	2
	Advanced Control Equipment	2
	Advanced Measurement Systems	2
	Advanced Image Measurement Systems	2
	Advanced Computational Mechanics	2
	Advanced Nano-mechanical systems	2
	Special Lecture	4
	○Advanced Exercises in Mechanical and Intellectual Systems Engineering	2
	○Advanced Exercises for Creative Designing toward Problem Solving	2
	○Special Study of Mechanical and Intellectual Systems Engineering	10
	Internship I	1
	Internship II	2
Cooperative and Interactive Internship Program for Creation	2	
Advanced Lecture for Intellectual Property	2	
Professional Education Lecture	4	

Major	Subjects (○ : Compulsory Subjects)	Credits
Life Sciences and Bioengineering	Advanced Molecular Biology	2
	Advanced Radiation Bioengineering	2
	Advanced Pharmacology and Genetic Engineering	2
	Advanced Metabolic Engineering	2
	Advanced Bioinformation Engineering	2
	Advanced Neural Systems	2
	Advanced Biomedical Engineering	2
	Advanced Synthetic Organic Chemistry	2
	Advanced Biomaterial Engineering	2
	Advanced Biochemical Reaction Engineering	2
	Advanced Process Systems Engineering	2
	Protein System Engineering	2
	Special Lecture	4
	Special Seminar on Life Sciences and Bioengineering	4
	○Advanced Exercises of Life Sciences and Bioengineering I	2
	○Advanced Exercises for Creative Designing toward Problem Solving	2
	Advanced Exercises of Life Sciences and Bioengineering II	2
	○Special Study of Life Sciences and Bioengineering	10
	Internship I	1
	Internship II	2
Cooperative and Interactive Internship Program for Creation	2	
Advanced Lecture for Intellectual Property	2	
Professional Education Lecture	4	
Environmental Applied Chemistry	Catalysis and Surface Science	2
	Advanced Lecture for Fine Organic Synthesis	2
	Advanced Industrial Organic Chemistry	2
	Advanced Crystallography for Molecular Solid State Materials	2
	Reaction of Coordination Compounds	2
	Advanced Electroanalytical Chemistry	2
	Advanced Environmental Analytical Chemistry	2
	Colloid and Interface Chemistry	2
	Advanced Computational Molecular Science	2
	Advanced Technology for Synthetic and Medicinal Chemistry	2
	Advanced Analytical and Interfacial Chemistry	2
	Bioengineering	2
	Biomaterial Engineering and Biomedical Science	2

Major	Subjects (○ : Compulsory Subjects)	Credits
Environmental Applied Chemistry	Special Lecture	4
	Special Seminar on Environmental Applied Chemistry	4
	○Advanced Exercises of Environmental Applied Chemistry I	2
	Advanced Exercises of Environmental Applied Chemistry II	2
	○Advanced Exercises for Creative Designing toward Problem Solving	2
	○Special Study of Environmental Applied Chemistry	10
	Internship I	1
	Internship II	2
	Cooperative and Interactive Internship Program for Creation	2
	Advanced Lecture for Intellectual Property	2
	Professional Education Lecture	4
Materials Science and Engineering	Advanced Course of Materials Process Engineering	2
	Reaction Design and Engineering	2
	Materials Forming and Engineering	2
	Materials Science for Controlling of Micro- and Nanostructures in Metals and Materials	2
	Functional Material Design Engineering	2
	Materials Environment and Surface Engineering	2
	Solid State Engineering	2
	Advanced Course of Surface Modification and Engineering I	2
	Advanced Course of Surface Modification and Engineering II	2
	Special Lecture	4
	Special Seminar on Materials Science and Engineering	4
	○Advanced Exercises for Creative Designing toward Problem Solving	2
	○Advanced Exercises of Materials Science and Engineering I	2
	Advanced Exercises of Materials Science and Engineering II	2
	○Special Study of Materials Science and Engineering	10
	Internship I	1
	Internship II	2
	Cooperative and Interactive Internship Program for Creation	2
	Advanced Lecture for Intellectual Property	2
Professional Education Lecture	4	

II

Graduate School of Science and Engineering for Education

Master's Program

Application Guide for International Students

【Engineering Division】

April 2018 Enrollment

Electric and Electronic Engineering

Intellectual Information Engineering

Mechanical and Intellectual Systems Engineering

Life Sciences and Bioengineering

Environmental Applied Chemistry

Materials Science and Engineering

Master's Degree Program Admission Policy

Graduate School of Science and Engineering for Education (Engineering Division)

Our six majors have the admission policies set below.

Electric and Electronic Engineering

- ◆ Students who have acquired a basic knowledge of electric and electronic systems engineering.
- ◆ Students who are highly motivated with a strong interest in the study of electric and electronic systems engineering.
- ◆ Students who have a strong desire to develop new technologies with the aim of creating a sustainable society.

Intellectual Information Engineering

- ◆ Students who have acquired a basic knowledge of information engineering, and have a great interest in learning and researching.
- ◆ Students who can accomplish academic research projects with continuous effort, through cooperation with others.
- ◆ Students who can comprehend and logically analyze issues in the field, clearly present them to others, and solve problems.
- ◆ Students who aim to contribute to society as professional engineers or researchers with sophisticated skills and a wide view.
- ◆ Students who have a desire to improve their communication skills in order to contribute to international society.

Mechanical and Intellectual Systems Engineering

- ◆ Students who have acquired a basic knowledge of mechanical engineering.
- ◆ Students who have clear objectives, high motivation to learn, and strong intellectual curiosity.
- ◆ Students who have abilities to find problems and systematically solve these problems.
- ◆ Students who have a profound interest in issues of the natural environment and the social implications of research on the development of human society.
- ◆ Students who have a desire to contribute to society as engineers and researchers.

Life Science and Bioengineering

- ◆ Students who have acquired a basic knowledge of life sciences and bioengineering with high study consciousness.
- ◆ Students who show strong enthusiasm for research through their active involvement.
- ◆ Students who have a desire to contribute to social development.

Environmental Applied Chemistry

- ◆ Students who intend to acquire the knowledge and technology skills of advanced chemistry and related fields.
- ◆ Students who are eager to contribute to the realization of a sustainable and environmentally harmonized society through craftsmanship.
- ◆ Students who will be engaged in the study of chemistry and the development of new functions for chemical materials.

Materials Science and Engineering

- ◆ Students who have acquired a basic knowledge of materials science and engineering, and have a strong interest and high motivation in studying related fields.
- ◆ Students who have acquired the abilities to think logically, understand deeply, identify problems, and work well with others for conducting research.
- ◆ Students who intend to acquire communication and presentation skills to make international contributions.
- ◆ Students who are eager to contribute to both local and global societies as professional engineers or scientists, possess high technical skills and broad perspectives, and develop deep interest and problem consciousness in the natural environment.

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1. Admission quota

Major	Admission quota
Electric and Electronic Engineering	A few
Intellectual Information Engineering	A few
Mechanical and Intellectual Systems Engineering	A few
Life Sciences and Bioengineering	A few
Environmental Applied Chemistry	A few
Materials Science and Engineering	A few

2. Eligibility requirements

Applicants must have non-Japanese citizenship and hold the residence status of ‘College Student’ at the time of admission as stipulated by the Immigration Control and Refugee Recognition Act, and meet one of the following qualifications. Those who are expected to obtain the residence status of ‘College Student’ may also apply.

- (1) Those who have graduated from a Japanese university, or are expected to graduate by March 31, 2018.
- (2) Those who have received, or are expected to receive a bachelor’s degree from a Japanese university by March 31, 2018 according to the provisions of Article 104, Paragraph 4, Section 1 of the School Education Law.
- (3) Those who have completed, or are expected to complete 16 years of education in foreign countries by March 31, 2018.
- (4) Those who live in Japan and completed, or are expected to complete 16 years of education in correspondence courses from a foreign-affiliated educational institution by March 31, 2018.
- (5) Those who have been designated by the Minister of Education, Culture, Sports, Science and Technology (Ministry of Education Notification No.5,1953).
- (6) Those who have completed, or are expected to complete 15 years of education outside Japan and who have been recognized by the Graduates School of Science and Engineering for Education, University of Toyama as having the prescribed credits with excellent academic results by March 31, 2018.
- (7) Those who are from counties where it does not take 16 years to graduate from university, and meet the following two conditions and have been recognized by the Graduates School of Science and Engineering for Education, University of Toyama as having academic abilities equivalent or superior to those of university graduates.
 - a) Those who, after completing university education, have been engaged or are expected to be engaged in research as research students or researchers for at least one year at university or research institutes equivalent to inter-university research institute by March 31, 2018.
 - b) Those who will reach the age of 22 by March 31, 2018.
- (8) Those who will reach the age of 22, and have been recognized by individual screening in the Graduates School of Science and Engineering for Education, University of Toyama as having academic abilities equivalent or superior to those of university graduates.

- (9) Those who have completed, or are expected to complete by March 31, 2018, a program of a foreign university or a foreign educational institution (limited to which its comprehensive progress of education and research have been evaluated by an external personnel certified by its government or its related agency, or an institution designated as equivalent by the Minister of MEXT) which requires more than three years to graduate and have been awarded a degree equivalent to a bachelor's degree.
- (10) Those who have completed, or are expected to complete by March 31, 2018, a foreign university program offered at an educational facility in Japan that recognized as having foreign educational system and designated by the Minister of Education, Culture, Sports, Science and Technology. (only for those who are recognized as completing a 16-years of education of that country.)
- (11) Those who have completed a specialized course at a specialized training college designated by the Minister of Education, Culture, Sports, Science and Technology, after the date stipulated by the Minister of Education, Culture, Sports, Science and Technology, after the date stipulated by the Minister of Education, Culture, Sports, Science and Technology. (The terms of study must be four years or more, and must meet the other criteria stipulated by the Minister of Education, Culture, Sports, Science and Technology.)

Note 1: If you have any questions about eligibility requirement (2), please contact us in advance.

Note 2: Please refer to page 34 for more information about the certification of case (6),(7),or (8).

3. Selection methods

- (1) Students eligible to enroll are selected based on the results of the academic ability assessment (written and oral) and submitted documents.
- (2) Academic ability will be determined by a written examination (Short Essay must be written in Japanese or English.) and an oral examination.
- (3) Examination date and location

Date	Item	Examination Subject	Time	Location	Remarks
August 29 (Tuesday), 2017	Arrival time		8:30	Faculty of Engineering University of Toyama (Gofuku campus)	
	Written examination	Short essay	9:00-10:30		
	Oral examination	Oral examination	From 13:30		

4. Application period

**All the application documents must be received
between July 24 (Monday) to July 28 (Friday), 2017.**

Applications brought in person will be accepted between 9am and 4pm during the application period.

Applications sent by mail must arrive by 4pm, on July 28 (Friday).

5. Application procedure

Please prepare the following documents and submit them to the address below by the deadline of submission. Please note that documents must be sent by registered mail and marked ‘Graduate school application form enclosed’ in red on the envelope.

Address: Administration Division, Faculty of Engineering (admissions office)
University of Toyama
3190 Gofuku, Toyama City, Toyama 930-8555, Japan
Tel: 076-445-6701 (Int’l calls: +81-76-445-6701)

Application documents

Documents		Outline
①	Application form (prescribed form)	Please fill out the necessary information.
②	Certificate of graduation (or expected graduation)	Please submit the original certificate issued by a school official. Those who have graduated, or are expected to graduate from the Faculty of Engineering of the University of Toyama do not need to submit.
③	Academic transcript(s)	The transcript(s) should be certified by a school official and be officially sealed in a school envelope.
④	Examinee ID card / Photo ID card (prescribed form)	Please use the designated form by the university. Fill out the necessary information and attach a photo of the applicant (H4cm×W3cm, upper body with no head covering, headshot taken within the last 3 months).
⑤	Envelope for return	This will be used for sending an admission card for examination. Please clearly state your name, address, and postal code on the envelope (23.5cm×12cm) and attach a 362-yen stamp to the envelope.
⑥	Certificate of Payment of Examination Fee	Examination fee: 30,000yen After making a bank transfer payment, please affix the certificate of payment issued by the bank to the “Certificate of Payment of Examination Fee”. (The applicant needs to pay a transfer fee separately.)
⑦	Mailing label (prescribed form)	Please fill out your postal code, address, and name in the form.
⑧	Certificate of approval for taking examination (free form)	If you are currently enrolled in the Master's programs of another university, or employed by a company or public office, please submit a letter from you manager / head of department giving approval for you to take the examination.
⑨	Statement of purpose (prescribed form)	Must be written by the applicant himself / herself.
⑩	Research plan (prescribed form)	Must be written in Japanese or English by the applicant himself / herself.

⑪	Copy of the certificate of residence	For a foreigner who currently lives in Japan, please submit a copy of the certificate of residence issued at the city hall of your residence. The document must clearly show your status of residence.
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Note:

- (1) Applicants who are eligible for requirement (2) in item 2, is required to submit the documents indicated separately (degree certificate, document certifying that you have applied to be awarded degree, etc.)
- (2) To make a request for application documents by mail, please enclose a return envelope (H33.2cm ×W24cm) clearly stating your name, address, and postal code with a 250-yen postage stamp affixed.

6. Payment of examination fee

Please pay the examination fee of 30,000 yen within the following period.

Between July 24 (Monday) to July 28 (Friday), 2017 (by 3:00pm)

Please pay the examination fee at the teller counter of a nearby financial institution (except for Japan Post Bank) that offers wire transfers using the “Request Form for Transfer” attached to this guideline. A separate transfer fee will be required. Transfer using an ATM is not accepted. Transfer cannot be made at a post office.

No refund of fees is given for any reason except in the following cases:

- ① The applicant paid the examination fee, but did not apply for admission to the University of Toyama (did not submit the application documents or the application documents were not accepted).
- ② The applicant paid the examination fee twice.
- ③ The applicant paid more than the designated examination amount.

Note:

IF you need to claim for a refund of the examination fee, please be sure to attach the “Certificate of Payment (Examination Fee)” to the “Request Refund Form” attached to this guideline and send it to the University of Toyama by mail.

Address: Accounting Division of Financial Affairs Department
University of Toyama
3190 Gofuku, Toyama City, Toyama 930-8555
TEL: (076)-445-6053

7. Approval of eligibility for application

For a person who applies based on the eligibility requirements (6), (7), or (8) in item 2, we will conduct a preliminary review. Please prepare the documents relating to the certification of eligibility qualifications in advance, and submit with necessary documents (academic transcripts, letter of recommendation, etc.) by the deadline below.

Application deadline: Must arrive by 4 pm on July 7 (Friday), 2017.
Applications brought in person will be accepted between 9am and 4pm.
Applications sent by mail must arrive by 4 pm on July 7 (Friday), 2017.

8. Announcement of successful applicants

Successful applicants' ID numbers will be posted at the Faculty of Engineering at 4 p.m. on September 8 (Friday), 2017 and the successful applicants will be notified individually.

The Faculty of Engineering will not accept any inquiries regarding the examination results by phone, fax, etc..

9. Admission procedures for successful applicants

The admission procedures are as follows. More details will be notified to each successful applicant.

(1) Deadline for admission procedures (April 2018 Enrollment)

Middle of December 2017 (subject to change)

(2) Expenses required for admission procedures

- ① Admission fee: 282,000yen (subject to change)

The above enrollment fee is the scheduled amount. If the admission fee is revised at the time of admission, a new admission fee will be applicable from the time of revision.

- ② Other expenses such as Personal Accident Insurance for Students Pursuing Education and Research will be required separately.

Note:

1. The tuition may be paid after admission. The exact amount of the fees and detailed method of payment will be explained at the time of the admission procedures. The tuition of academic year 2017 was 535,800 yen.

To cancel your admission to the University of Toyama, you must notify us in writing.

2. Individuals who have difficulty making payment of the admission fee and tuition fees due to financial problems or some other unavoidable circumstances, may apply for exemption or postponement of payment. Individuals may also apply for a scholarship loan from organizations such as the Japan Student Services Organization.

- (3) **Caution:** If you do not complete the admission procedures by the deadlines, you will be considered to have declined admission.

10. Policy on personal information protection

The personal information possessed by the University of Toyama shall be handled based on the “Act on the Protection of Personal Information Held by Independent Administrative Agencies, etc.” and “University of Toyama Personal Information Protection Policy”.

- (1) The names, addresses, and other personal information of applicants obtained through the application shall be used for ① admission and selection procedure, ② announcement of successful applicants, ③ admission procedure, ④ survey/study in the selection method of enrolled students, and ⑤ operations associated with these purposes.

- (2) Personal information obtained through the application, only of those who completed the admission procedure, shall be used for graduate school preparation programs prior to admission and/or post-admission operations related to ① academic affairs (school register, study guidance, etc.), ② student support (health care, application for tuition waiver/scholarship, career support), and ③ collection of tuition. ④ statistical survey and data analysis.

- (3) Only the applicant ID numbers, names and addresses of successful applicants may be used for contact with the

Alumni Association and Cooperative Association which are affiliated organizations. NOTE: If you do not wish to have any contact with these organizations, please inform our Administration Division, Faculty of Engineering (in charge of admission).

- (4) In the use of personal information for various types of operations, some of the operations may be conducted by a vendor contracted with the relevant operations from our university (hereinafter referred to as “contractor”). When contracting the operations, all or part of the personal information obtained shall be provided to the contractor within the limit necessary to perform the contracted operations. We supervise the use of information to ensure compliance with confidentiality.

11. IMPORTANT

- (1) Application may not be accepted if applicants fail to submit any of the required documents.
- (2) Application documents cannot be changed once they have been submitted.
- (3) Application documents will not be returned in any circumstances once they have been submitted.
- (4) Be sure to bring the examination admission card to the exam.
- (5) Applicants who do not take all the required examination will be automatically disqualified from the selection process.
- (6) Any information found to be incorrect at any stage will automatically lead to cancellation of the admission.
- (7) Please forward any inquiry about the application or other matters to the following address.

Address: Administration Division, Faculty of Engineering (admissions office)
University of Toyama
3190 Gofuku, Toyama City, Toyama 930-8555
Tel: 076-465-6701

12. Applicants with special needs

The University provides consultation for applicants with special needs who may require special arrangements during the entrance examinations or in classes after enrollment. Please contact our Administration Division, Faculty of Engineering prior to the application process.

Applicants with special needs may submit a medical certificate issued by a doctor and supporting documents specifying following information.

- Type(s) of disabilities, and the degree of severity
- Request for special arrangements required during the entrance examinations
- Request for special arrangements required in class
- Situation of daily life and other related information

- ① Consultation deadline: July 7 (Friday), 2017
- ② Contact: Administration Division, Faculty of Engineering (admissions office)
University of Toyama
3190 Gofuku, Toyama City, Toyama 930-8555
TEL: 076-445-6701

Master's Programs of Graduate School of Science and Engineering for Education 【Engineering Division】

1 Major Overview

(1) Electric and Electronic Engineering

The Master's Program in Electric and Electronic Engineering is composed of three divisions: (1) Electric Systems Engineering, (2) Communication and Control Engineering, and (3) Electronic Materials and Device Engineering. The curriculum covers a wide range of topics on electric and electronic engineering. Research topics include the generation and control of electric energy, communication and control engineering, development of new electronic materials and devices, and computer simulation. The latest trends in electric and electronic engineering, such as communication and broadcasting, assistive robotics for aging societies, nano- and bioelectronics, and neuroscience, are also part of our research. The mission of the Master's Program in Electric and Electronic Engineering is to provide students with an advanced education and research opportunities, thereby preparing future engineers to address new challenges. The Master's Program will increase your employment prospects in leading companies in the fields of electric, mechanical, and chemical engineering.

Educational field	Overview	Specialized subjects
Electric Power System Engineering	Based on high-voltage and plasma engineering, we conduct education and research on pulsed-power technology and its application to high-power pulsed beams and high-energy plasmas for inertial fusion and materials processing, atmospheric and laser-produced plasmas for environmental and biological treatments, lightning discharge observations, and emission spectroscopy of multiply charged heavy ions for short-wavelength light sources.	Advanced Electric Power Engineering 1
Intelligent Power System Engineering	We conduct education and research about advanced analytical techniques required for the secure operation and planning of future electric power systems. Recent interests have included the investigation of the effect of renewable energy sources (RESs) on the power system operations and stability and the development of countermeasures for the integration of RESs while maintaining secure power system operation.	Advanced Electric Power Engineering 2 Advanced Electric Power Engineering 3
Energy Conversion Engineering	We conduct education and research on applied electromagnetic technologies such as magnetic levitation, magnetic bearings, linear motors and actuators, and power electronics technologies, which are indispensable for natural energy generation and high-efficiency power conversion in the interconversion of electrical energy and mechanical energy.	Advanced Energy Conversion 1 Advanced Energy Conversion 2
Intelligent Robotics Engineering	We conduct education and research on topics such as robotic systems, autonomous mobile robots, biorobotics, rehabilitation robotics, intelligent control, and soft computing.	Advanced Theory of Robot Control 1 Advanced Theory of Robot Control 2

Educational field	Overview	Specialized subjects
Wave Communication Engineering	Education and research on communication engineering, focused on the properties of waves and their propagation, are conducted. The main research topics are 1) sound technologies for ultra-realistic communication including sound pick up, coding, transmission, and reproduction, and 2) computer simulation of electromagnetic wave propagation for the prediction of earthquakes.	Selected Topics in Wave Communication Engineering 1 Selected Topics in Wave Communication Engineering 2
Communication Systems Engineering	We conduct education and research on the advanced utilization of computers and the development of new frequency resources and communication systems, such as electromagnetic field analysis, signal processing, network connection techniques, and millimeter-wave and terahertz engineering.	Advanced Communication Systems 1 Advanced Communication Systems 2 Advanced Communication Systems 3
Bio-Information Engineering	We conduct education and research in a wide range of bio-information systems, such as the methods of analyzing and measuring biological information and the development of health-care devices, considering both hardware and software, which are based on measurement, control, information processing, and system engineering.	Advanced Biological Systems 1 Advanced Biological Systems 2
Measurement Systems Engineering	We conduct education and research on small and integrated measurement systems developed using advanced technologies in biotechnology and electronics, such as integrated miniature biosensors, biochips, and microarrayed chips for medical diagnostics and environmental monitors.	Measurement Systems 1 Measurement Systems 2
Nanoelectronics Engineering	We study semiconductor nanodevices, micro mechanical electrical systems (MEMS), and their applications. Resonant tunneling devices and terahertz integrated circuits based on them are among the most active research subjects. We also study fabrication processes, epitaxial crystal growth, and characterization technologies for semiconductor devices in order to realize next-generation high-performance integrated circuits.	Advanced Solid State Electronics 1 Advanced Solid State Electronics 2
Electron Device Engineering	We conduct education and research in the physics and electro-optical properties of organic materials, the basic science and technology of electron devices and displays, and their applications, e.g., in liquid crystal devices, organic light-emitting devices, organic-based transistors, organic sensing devices, organic-based solar cells, and novel multi-functional devices.	Advanced Electronic Devices 1 Advanced Electronic Devices 2

Educational field	Overview	Specialized subjects
Basic Material Engineering	Education and research of the structure, physical property, and application of single crystals, thin films, and nanomaterials of semiconductors and ferroelectrics are conducted. In particular, gas sensors made of oxide semiconductor nanomaterials formed by sputtering or thermal vapor deposition are studied. Electric property and atomic structure of ferroelectric single crystals grown in aqueous solution are also investigated.	Fundamental Material Engineering 1 Fundamental Material Engineering 2

(2) Intellectual Information Engineering

We offer education and perform research on information and communication technologies, including software, hardware, communication, internet, multimedia, artificial intelligence, medical applications, and quantum information. The education and research of our division also address the science of recognition, human senses, and sensibility, such as vision and hearing, computation of the brain and nerves, and technology for building a ubiquitous society.

Educational field	Overview	Specialized subjects
Computer Software System	We conduct education and research on digital signal processing and its applications. Signals of interest include audio, imaging, economics, finance, cosmic rays, biological signal, and, many others. The processing of such signals includes denoising, compression, visualization techniques, and brain-computer interfaces.	Advanced System Engineering 1 Advanced System Engineering 2
Medical Information Sensing	We conduct education and research on the sensing of morphological and functional information of biological bodies for biomedical applications. In particular, we develop signal- and image-processing techniques for ultrasonic measurements. We also conduct education and research on pattern recognition and its applications, such as image analysis, character recognition, person finding, person identification, object recognition, vehicle safety tasks, and industrial inspections.	Advanced Medical Information Sensing 1 Advanced Medical Information Sensing 2
Media Information Communication Technology	We conduct education and research on media information communication technology. Our aims are to elucidate the basis of the quality of experience for visual media using signal processing techniques. We also work to develop intelligent transport system applications.	Advanced Media Information Communication 1 Advanced Media Information Communication 2 Advanced Media Information Communication 3

Educational field	Overview	Specialized subjects
Simulation Engineering	We conduct education and research on simulations of physical processes by computational means. Our aim is to develop software to confirm the performance and quality of industrial products, driving and traffic simulators, and educational gaming software. We also perform particle simulations for plasmas.	Advanced Simulation Engineering 1 Advanced Simulation Engineering 2
Visual Information Processing Engineering	We conduct education and research on visual information processing engineering, color engineering, evaluation and analysis of CG/3-D visible images, optical and visual environment engineering, traffic visual environment engineering, urban landscape lighting, and the development of universal designs for elderly persons and people with synesthesia.	Advanced Visual Information Processing
Neural Information Technology	We conduct education and research in bioinformatics. We investigate the relationship between gene sequence, protein structure/function, neural/cardiac function, behavior, and disease using computer protein structure modeling, in-silico pathogenicity prediction, and electrophysiological/behavioral measurements.	Advanced Neural Information Processing
Information Communication Networks	We conduct education and research on optical signal processing, transmission systems for the signals of emergency events such as earthquakes, modulation systems, transmission systems, optical communication systems, information communication networks, communication quality, and solitons.	Advanced Communication Theory 1 Advanced Communication Theory 2
Artificial Intelligence	We conduct education and research on the design, analysis, and evaluation of various artificial intelligent methodologies, including the artificial neural networks which are inspired by the human brain's architecture and information processing mechanisms, the deep learning which is able to learn by itself, particle swarm optimization, ant colony optimization, error back-propagation method, genetic algorithm, evolutionary strategy, and other machine learning technologies.	Advanced Artificial Intelligence 1 Advanced Artificial Intelligence 2
Quantum Information	We are working on quantum information where application of quantum mechanics offers revolutionary improvements to information processing. In particular, we are aiming at the realization of quantum communication, such as quantum key distribution and quantum repeaters. We also apply Shannon's classical information theory to modern sensing and communications issues.	Quantum Information Processing 1 Quantum Information Processing 2

(3) Mechanical and Intellectual Systems Engineering

In this department, research is focused on the global topics of energy conservation, environmental load reduction, and the realization of a safe, secure, and comfortable society infrastructure. This includes ongoing research on the structure and performance of machinery and its efficiency, the development of consistent production systems with optimized cycles from design to value-added machinery with improved reliability. The field involves experimental and numerical analyses of a range of fluid mechanics phenomena from high-efficiency energy conversion to its effective utilization, as well as the analysis of combined heat and fluid phenomena with the aim of producing low-energy-loss machinery from the micro-to macro-scale. Education and research are also conducted on the strength evaluation and analysis of physical phenomena related to high machine intelligence, the development of micro-scale mechanisms, design of control systems, non-destructive measurement technologies, and computing and simulation technologies.

Educational field	Overview	Specialized subjects
Solid Mechanics	We focus on mechanical structures under complex physical conditions. Their behaviors are linked to stresses, displacements, and fracture thresholds of the structures. We conduct education and research based on the quantitative evaluation of the fracture process and the investigation of fracture mechanisms using experimental methods, observations, and numerical analysis.	Advanced Physics of Elasticity Advanced Physics of Plasticity
Strength and Fracture of Materials	Based on theory that combines micro- and macro-scale approaches to the strength and fracture mechanisms of machinery, education and research on reliability design methods is conducted for structural and functional materials, including new materials. The construction of a database on strength design is performed together with the development of environmental strength design methods.	Advanced Strength Design Engineering Advanced Element Design Engineering
Advanced Materials and Forming	We conduct education and research on the optimal design and applications of machining tools, based on improving the required plasticity characteristics and working processes of various structural and functional materials, involving the control of materials compositions and the analysis of plastic deformation.	Advanced Mechanical Material Processing Advanced Technology of Plasticity
Thermal Engineering	We conduct education and research on the basics and applications of thermal energy, concentrating on micro- and macro-scale thermodynamics, heat engine engineering, and understanding the combustion process in terms of its application. The thermal physical properties of various materials are measured and analyzed and mathematical analyses of heat conduction are performed. In applications to the global environment, heat transfer phenomena with phase changes, latent heat storage, and energy utilization from natural sources are studied.	Advanced Technical Thermodynamics Advanced Heat Transfer Engineering

Educational field	Overview	Specialized subjects
Fluid Engineering	We conduct education and research on fluid flow and the micro- or macro- structures of turbulence formed in the internal flow around various objects in fluid devices, aiming to elucidate and reduce turbulence associated with energy transfer for technological applications. We also investigate by experimental and numerical analysis the unsteady flow phenomena in aerodynamic noise.	Advanced Fluid Engineering Advanced Fluid Dynamics
Intelligent Machine	For the development of advanced mechatronics intended to create high-precision, high-speed, high-response machinery, we conduct education and research on dynamical analysis and the configuration and design of new mechanical systems.	Advanced Dynamics of Mechanical Systems Advanced Robotics
Control System	We conduct education and research on development of control systems such as human cooperation robot systems considering human emotion, visual servo systems based on image processing technology, and swarm systems using evolution and learning approaches.	Advanced Autonomous Systems Engineering Advanced Control Equipment
Mechanical Information and Instrumentation	Our aim is image-position measuring of large-scale environments and force sensing for micro-handling. We conduct education and research on the development of new measuring methods, systems, and sensors.	Advanced Measurement Systems Advanced Image Measurement Systems
Applied Mechano-Informatics	We conduct education and research on numerical analysis and simulation technology utilizing computers, addressing mechanical engineering problems based on the control of physical phenomena, ranging from the micro-scale level of elucidating molecular and atomic mechanisms to macro-scale levels such as analyzing aircraft aerodynamics.	Advanced Computational Mechanics Advanced Nano-mechanical Systems Advanced Mathematical and Numerical Analysis for Environment

(4) Life Sciences and Bioengineering

The development of technology for human health care and for promoting happy human living is an important endeavor for science, anytime and anywhere in the world. Issues such as overcoming incurable diseases, including cancers, or aiding in the treatment of brain dysfunctions and physical disabilities due to aging or disease are the areas to which science is expected to contribute the most in the 21st century. The University of Toyama Department of Life Science and Bioengineering endeavors to clarify bio-functional and pathophysiological phenomena from the molecular, genetic, protein, and cellular levels to the biological system level. This will be done in collaboration with and through the application of expertise and technology from related scientific fields such as organic synthesis, genetic engineering, bioelectrical and bioelectronic engineering, biomaterials engineering, behavioral pharmacology, regenerative medicine and engineering, and biochemical process science. The department also seeks to develop useful medical products, to create and produce bio-functional materials, to design new analytical tools and bio-medical equipment, and finally, to create production apparatus or large-scale processing plants in order to supply the materials we develop to society. The Department of Life Science and Bioengineering conducts education and research regarding the manufacture of products that support the life and medical sciences and contribute to

their progress, thus providing human resource development that enables graduates to succeed as engineering specialists in both the life and medical sciences.

Educational field	Overview	Specialized subjects
Engineering based on Genetic Information	We conduct education and research to understand the molecular bases of human diseases from molecular-genetic and immunological viewpoints. We apply this knowledge to the development of biotechnology.	Advanced Molecular Biology Advanced Radiation Bioengineering
Pharmacology	Our aim is to provide researchers and engineers with the knowledge and technology of pharmacology and genetic engineering. Our research group aims to elucidate the mechanisms of chronic pain and neuropsychiatric disorders and develop new medications against them.	Advanced Pharmacology and Genetic Engineering
Biological Chemistry	We investigate the relationship between the metabolism of a drug or toxin and the expression of drug efficacy or toxicity, the purification of metabolic enzymes, the conversion of environmental pollutants to useful materials using enzymes or microorganisms, and the application of enzymes to organic syntheses and analytical chemistry.	Advanced Metabolic Engineering
Bioelectronics and Bioelectrical Engineering	Research and education concerning the interdisciplinary region between bioscience and electrochemical or electrical engineering are conducted. Enzyme sensors and cell-based biosensors for medical diagnostics and pharmaceutical tests are studied. Basic and applied research of various electrical treatments of microorganisms and mammalian cells are also studied.	Advanced Bioinformation Engineering
Brain and Neural Systems Engineering	From a biophysical view, we research the rules underlying the functions of the brain and neural system and utilize these rules for engineering applications. Focusing on the mechanisms of learning and memory, we investigate network dynamics using neural recording and pharmacological techniques and conduct education and research on engineering applications of neural network dynamics.	Advanced Neural Systems
Tissue Engineering and Regenerative Medicine	We have developed bioprinting and biofabrication methodologies to construct complicated 3D tissues. We aim to develop additional innovative multi-scale processing engineering methods, using biomaterial, biofabrication, and industrial technologies, for next-generation engineering of tissues and organs as well as for regenerative medicine. We explore multi-disciplinary approaches to generate tissue and organ models for basic investigations of molecular/cell/tissue biology and therapeutic biomedical research.	Advanced Biomedical Engineering

Educational field	Overview	Specialized subjects
Bio-functional Molecule Engineering	The principal focus of this group is the development of the design and synthesis procedure of small molecules, as well as their biological evaluation as candidates in drug discovery.	Advanced Synthetic Organic Chemistry
Biomaterial Engineering	Using the self-organizing mechanism essential to organisms, this major conducts educational research on biomaterial engineering for the design of biocompatible medical materials and the application of the mechanism to functional material synthesis processes.	Advanced Biomaterial Engineering
Biochemical Reaction Engineering	We conduct education and research on the understanding of metabolic mechanisms, the biochemical reaction functions of biocatalysts such as microorganisms, plants, and animals and the industrial production of useful metabolites and biochemicals for human life.	Advanced Biochemical Reaction Engineering
Process Systems Engineering	We conduct education and research on process systems engineering, which addresses the optimal design, operation, and control of complex systems, such as chemical, biochemical, petrochemical, and pharmaceutical processes.	Advanced Process Systems Engineering
Protein System Engineering	Proteins are necessary for virtually every activity in the human body. Our goal is to understand how proteins are produced and degraded in the cell in terms of protein science and biophysics. Based on the above knowledge, we also aim to develop novel technologies that can regulate the lifespans of proteins for various practical applications.	Advanced Protein System Engineering

(5) Environmental Applied Chemistry

Chemistry is an academic discipline that aims to create and design new materials and systems based on chemical reactions and elucidate the properties of these materials from atomic and molecular perspectives. Applied chemistry is an academic field derived from chemistry that aims to produce new technologies. A broad range of chemical education and research related to physics and biology is conducted in this major to cultivate human resources capable of creating new functional materials and the technology to produce these materials. The research subjects listed below cover a wide range of chemistry specialties, including the syntheses of highly functional materials and molecules and the elucidation of their reaction mechanisms, development of complicated biofunctions and elucidation of their mechanisms, environmental assessment of chemical materials, and novel energy science.

Educational field	Overview	Specialized subjects
Catalysis, Energy and Material Engineering	We research the development of environmentally friendly catalysis processes, the green utilization of natural resources including biomass and sunlight, the development of alternative energy instead of petroleum, and novel nanomaterials.	Catalysis and Surface Science Industrial Organic Chemistry

Educational field	Overview	Specialized subjects
Environmental and Functional Molecular Chemistry	Education and research are conducted on the following: 1) synthesis of materials containing functional molecules and polymers, 2) establishment of techniques using these materials for separation and preconcentration of elements, and 3) application of the techniques to environmental analysis, treatment of wastewater, and recovery of rare elements. Research on the adsorption and desorption behaviors of materials at the solid-liquid interface, including the development of surface modification techniques and antifouling materials, is also conducted.	Advanced Environmental Analytical Chemistry Advanced Interfacial Analytical Chemistry
Applied Inorganic Chemistry	Physiological and pharmacological studies have revealed the sophisticated functions of metal complexes, which may be related to their atomic structures and electronic states. From the perspective of the engineering applications of such functions, education and research are performed to develop highly functionalized materials and chemicals produced with metal complexes and their aggregates.	Reaction of Coordination Compounds Advanced Crystallography for Molecular Solid State Materials
Computers and Applied Chemistry	The recent rapid development of computer technology has enabled us to analyze and predict various chemical reactions and molecular dynamics based on computational chemistry. This class summarizes the basic theory of ab initio electronic structure calculations, such as molecular orbital and density functional methods.	Advanced Computational Molecular Science
Biomolecular Chemistry	Organic chemistry has been vigorously applied to molecular biology. Our objectives are to reveal the properties of biomolecules using various methods based on chemical biology. We also engage in the development of new techniques for the analysis of intermolecular interactions, such as protein-protein interactions.	Biochemical Engineering
Synthetic and Medicinal Chemistry	This field focuses on creation of novel “functional organic molecules” based on the advanced synthetic organic chemistry. The newly designed organic molecules possess some potential to contribute to various fields of science such as discovery of novel medicines and agrichemicals. Research in our group is primarily aimed toward the development of catalytic reactions and methods for organic synthesis for the functional organic molecules.	Advanced Synthetic Chemistry for Drug Discovery Advanced Organic Reaction
Environmental Analytical Chemistry	We conduct educational research on the design and synthesis of highly functional optical sensor molecules for the sensing of metabolites, such as glucose or lactate, and ions, such as potassium or sodium, in the human body, and the application of such molecules to a novel optical sensing system for the minimally invasive monitoring of vital ions and metabolites as a tool for biochemical and clinical analyses.	Advanced Electroanalytical Chemistry

Educational field	Overview	Specialized subjects
Colloid and Interface Chemistry	We focus on teaching the basic theory on the interfaces that form common boundaries between two phases, such as gas/liquid, liquid/solid, and solid/gas. Basic studies investigating unknown phenomena in dispersions of nanometer- to micrometer-sized particles and applied research in the development of new optical materials and porous materials are conducted.	Colloid and Interface Chemistry
Biomaterial Designing and Engineering	Education and research are conducted on the design of biomaterials for contributing to regenerative medicine, based on protein engineering, polymer science, cell biology, and molecular biology. We aim to construct functional biomaterials such as screening devices for various diseases and supporting materials for cell transplantation to cure otherwise intractable disorders.	Biomaterial Engineering and Biomedical Science

(6) Materials Science and Engineering

Our purpose for education in the acquisition of extensive knowledge and the improvement of problem-solving abilities for society through educational research from fundamentals to the advanced development of new functional materials.

Educational field	Overview	Specialized subjects
Materials Forming and Engineering	We conduct education and research related to the processing and design of fabricated materials based on the phase transition from liquid to solid, through the development and application of melting, casting, and solidification techniques of metal and the forming of materials, to produce high-performance and high-function fabricated materials.	Materials Forming and Engineering
Microstructure Control Engineering	The microstructure control engineering course is focused on establishing and designing new metallic materials for energy saving and environmental conservation. Research topics also include advanced microstructure control technologies using high-resolution transmission electron microscopy and scanning electron microscopy.	Materials Science for Controlling of Micro- and Nanostructures in Metals and Materials
Functional Material Design Engineering	Education and synthetic research and development are conducted on the functional materials of ceramics, metals, and new complex materials through designing, structural control, combining additives such as rare earth metals, improving fabrication processes, and evaluating their properties and applications.	Functional Material Design Engineering

Educational field	Overview	Specialized subjects
Materials Environment and Surface Processing	In order to improve the corrosion resistance of metal materials, we investigate and instruct about electrochemical methods in various alloys. We focus especially on the characterization of passivation films and functional films that are fabricated by electrochemical methods.	Materials Environment and Surface Engineering
Solid State Engineering	We conduct education and research on the electric, magnetic, and thermal properties of superconductors, magnetic materials, and cryogenic materials of alloys, intermetallic compounds, and conductive oxides to achieve improved performance and applications of the materials.	Solid State Engineering
Materials Processing Engineering	Targets of education and research in this laboratory are the key fundamental processes for industrial products, starting from the designing of materials addressing the control of phenomena in materials through elucidating their mechanisms, and optimizing their related production processes. The main subjects are 1)heat and mass transfer phenomena, 2)visualization techniques, 3)surfaces and interfaces, and 4)joining and welding.	Advanced Course of Materials Process Engineering
Surface Coatings and Engineering	This laboratory is managed for education and research of surface coating technologies. We focus on improvements or new additions to various properties such as the mechanical, electrical, or optical properties of materials by the addition of hard coatings of oxide, nitride, coatings of oxide, nitride, and carbide films and/or nano-composite films thereof on the surface of metal or inorganic materials, or by the deposition of functional films.	Advanced Course of Surface Modification and Engineering I Advanced Course of Surface Modification and Engineering II
Engineering for Reaction Design	We conduct education and research related to the design of reactions for the highly effective conversion and utilization of petroleum-derived materials from engineering perspective.	Reaction Design and Engineering

2. Supervisors and Educational field

Major	Educational field	Supervisors	Remarks
Electric and Electronic Engineering	Electric Power System Engineering	Prof. Hiroaki Ito Lecturer Hayato Ohashi	
	Intelligent Power System Engineering	Prof. Kazuyuki Tanaka	
	Energy Conversion Engineering	Prof. Takahisa Ohji Associate Prof. Kenji Amei	
	Intelligent Robotics Engineering	Associate Prof. Hideki Toda	
	Wave Communication Engineering	Prof. Akio Ando Associate Prof. Masafumi Fujii	
	Communication Systems Engineering	Prof. Koichi Ogawa Associate Prof. Tatsuo Nozokido Lecturer Kazuhiro Honda	
	Bio-Information Engineering	Prof. Kazuki Nakajima Lecturer Juhyon Kim	
	Measurement Systems Engineering	Prof. Masayasu Suzuki	
	Nanoelectronics Engineering	Prof. Koichi Maezawa Associate Prof. Masayuki Mori	
	Electron Device Engineering	Prof. Hiroyuki Okada Prof. Shigeki Naka	
	Basic Material Engineering	Associate Prof. Toshio Kikuta	
Intellectual Information Engineering	Computer Software System	Prof. Shigeki Hirobayashi Associate Prof. Tadanobu Misawa	
	Medical Information Sensing	Prof. Hideyuki Hasegawa Associate Prof. Mitsuru Sakai	
	Media Information Communication Technology	Prof. Yuukou Horita Lecturer Yasuhiro Inazumi Lecturer Keiji Shibata	
	Simulation Engineering	Prof. Masahiro Sato Lecturer Takayuki Haruki	
	Visual Information Processing Engineering	Associate Prof. Mamoru Takamatsu	
	Neural Information Technology	Associate Prof. Toshihide Tabata	
	Information Communication Networks	Prof. Koji Kikushima Lecturer Hiroshi Kakuhata	
	Artificial Intelligence	Prof. Zheng Tang Associate Prof. Shangce Gao	
	Quantum Information	Prof. Kiyoshi Tamaki Lecturer Tatsuto Murayama	
Mechanical and Intellectual Systems Engineering	Solid Mechanics	Prof. Katsuyuki Kida Lecturer Kenichi Masuda	
	Strength and Fracture of Materials	Prof. Noriyasu Oguma Associate Prof. Koichi Kasaba	
	Advanced Materials and Forming	Prof. Norio Takatsuji (※) Associate Prof. Tetsuo Aida	
	Thermal Engineering	Prof. Atsumu Tezaki Prof. Yoshio Hirasawa(※)	
	Fluid Engineering	Prof. Kiyoshi Kawaguchi Lecturer Daisuke Watanabe	
	Intelligent Machine	Prof. Hiroyuki Kimura Lecturer Masahiro Sekimoto	
	Control System	Prof. Mitsuru Jindai Associate Prof. Toshiyuki Yasuda	

Major	Educational field	Supervisors	Remarks
Mechanical and Intellectual Systems Engineering	Mechanical Information and Instrumentation	Prof. Tohru Sasaki Associate Prof. Kenji Terabayashi	
	Applied Mechano-Informatics	Prof. Kisa Matsushima(※) Associate Prof. Takeshi Seta Lecturer Tatiana N. Zolotoukhina	
Life Sciences and Bioengineering	Engineering based on Genetic Information	Prof. Masaharu Isobe Prof. Nobuyuki Kurosawa	
	Pharmacology	Associate Prof. Ichiro Takasaki	
	Biological Chemistry	Lecturer Michio Sayama	☆
	Bioelectronics and Bioelectrical Engineering	Prof. Hiroaki Shinohara	
	Brain and Neural Systems Engineering	Prof. Shigenori Kawahara	
	Tissue Engineering and Regenerative Medicine	Prof. Makoto Nakamura	
	Bio-functional Molecule Engineering	Prof. Naoki Toyooka	
	Biomaterial Engineering	[UNDECIDED]	☆
	Biochemical Reaction Engineering	Associate Prof. Kazuhiro Hoshino	
	Process Systems Engineering	Associate Prof. Taketoshi Kurooka	
Environmental Applied Chemistry	Protein System Engineering	Associate Prof. Tomonao Inobe	
	Catalysis, Energy and Material Engineering	Prof. Noritatsu Tsubaki Associate Prof. Yoshiharu Yoneyama	
	Environmental and Functional Molecular Chemistry	Prof. Shigehiro Kagaya Associate Prof. Makoto Gemmei	
	Applied Inorganic Chemistry	Prof. Senichi Aizawa Associate Prof. Akira Miyazaki	
	Computers and Applied Chemistry	Associate Prof. Tatsuya Ishiyama	
	Biomolecular Chemistry	Associate Prof. Masafumi Sakono	
	Synthetic and Medicinal Chemistry	Prof. Hitoshi Abe Associate Prof. Yoshikazu Horino	
	Environmental Analytical Chemistry	Prof. Koji Tohda	
	Colloid and Interface Chemistry	Associate Prof. Kensaku Ito	☆
Materials Science and Engineering	Biomaterial Designing and Engineering	Associate Prof. Tadashi Nakaji	
	Materials Forming and Engineering	Prof. Seiji Saikawa	
	Microstructure Control Engineering	Prof. Kenji Matsuda Associate Prof. Seungwon Lee	
	Functional Material Design Engineering	Prof. Atsushi Saiki	
	Materials Environment and Surface Processing	Prof. Satoshi Sunada Associate Prof. Masahiko Hatakeyama	
	Solid State Engineering	Prof. Katsuhiko Nishimura Associate Prof. Takahiro Namiki	
	Materials Processing Engineering Laboratory	Prof. Toshiya Shibayanagi Associate Prof. Masamichi Yoshida	
	Surface Coatings and Engineering	[UNDECIDED]	☆
Engineering for Reaction Design	Prof. Satoru Murata	☆	

(Notes)

1. The “field of education” filled in on the application form etc. should be chosen from this list.
2. We are not inviting applicants for the 2018 academic year for the fields of education marked with a star (☆) in the “Remarks” column.
3. The staff marked ※ are due to retire in March 2019.
4. If you have any questions, please contact the person in charge of admissions at the Administration Department of the Faculty of Engineering of this University.

3. Degree Requirements and Completion

A master's degree will be conferred to those who have attended our graduate school for at least two years, earned more than 30 credits of compulsory subjects specified by each major, and passed the thesis review and final examinations. However, the term of residence may be reduced to a minimum of one year for those students who have showed excellent research performance.

4. Long-term Curriculum Program

A long-term curriculum program is a program intended for those who cannot complete the curriculum under the standard course term because the curriculum hours for classes and research instruction are limited due to reasons such as they are working (full-time) and they intend to complete educational courses in a planned manner during a certain period longer than the standard course term. In our Master's program, the student's school days are accepted up to a total of 4 years. If permitted at the time of admission, the total amount of tuition to be paid in the standard course term(2 years) can be paid evenly for each school term during the period accepted as a long-term curriculum period.

Note:

1. Details, including the method of application for this program, shall be notified to applicants when the documents for admission procedures are sent.
2. Please note that not every applicant is necessarily permitted to enter this program.

5. Courses and Credits

Major	Subjects (○ : Compulsory Subjects)	Credits
Electric and Electronic Engineering	Advanced Electric Power Engineering 1	2
	Advanced Electric Power Engineering 2	2
	Advanced Electric Power Engineering 3	2
	Advanced Energy Conversion 1	2
	Advanced Energy Conversion 2	2
	Advanced Theory of Robot Control 1	2
	Advanced Theory of Robot Control 2	2
	Selected Topics in Wave Communication Engineering 1	2
	Selected Topics in Wave Communication Engineering 2	2
	Advanced Communication Systems 1	2
	Advanced Communication Systems 2	2
	Advanced Communication Systems 3	2
	Advanced Biological Systems 1	2
	Advanced Biological Systems 2	2
	Measurement Systems 1	2
	Measurement Systems 2	2
	Advanced Solid State Electronics 1	2
	Advanced Solid State Electronics 2	2
	Advanced Electronic Devices 1	2
	Advanced Electronic Devices 2	2

Major	Subjects (○ : Compulsory Subjects)	Credits
Electric and Electronic Engineering	Fundamental Material Engineering 1	2
	Fundamental Material Engineering 2	2
	Special Lecture	4
	○Advanced Exercises for Creative Designing toward Problem Solving	1
	○Advanced Exercises in Electric and Electronic Engineering	3
	○Special Study of Electric and Electronic Engineering	10
	Internship I	1
	Internship II	2
	Cooperative and Interactive Internship Program for Creation	2
	Advanced Lecture for Intellectual Property	2
	Professional Education Lecture	4
Intellectual Information Engineering	Advanced System Engineering 1	2
	Advanced System Engineering 2	2
	Advanced Medical Information Sensing 1	2
	Advanced Medical Information Sensing 2	2
	Advanced Media Information Communication 1	2
	Advanced Media Information Communication 2	2
	Advanced Media Information Communication 3	2
	Advanced Simulation Engineering 1	2
	Advanced Simulation Engineering 2	2
	Advanced Visual Information Processing	2
	Advanced Neural Information Processing	2
	Advanced Communication Theory 1	2
	Advanced Communication Theory 2	2
	Advanced Artificial Intelligence 1	2
	Advanced Artificial Intelligence 2	2
	Quantum Information Processing 1	2
	Quantum Information Processing 2	2
	Outline of Electronics & Information Engineering	2
	Advanced Algorithms	2
	Special Lecture	4
	○Advanced Exercises in Intellectual Information Engineering	3
	○Advanced Exercises for Creative Designing toward Problem Solving	1
	○Special Study of Intellectual Information Engineering	10

Major	Subjects (○ : Compulsory Subjects)	Credits
Intellectual Information Engineering	Internship I	1
	Internship II	2
	Cooperative and Interactive Internship Program for Creation	2
	Advanced Lecture for Intellectual Property	2
	Professional Education Lecture	4
Mechanical and Intellectual Systems Engineering	Advanced Physics of Elasticity	2
	Advanced Physics of Plasticity	2
	Advanced Strength Design Engineering	2
	Advanced Element Design Engineering	2
	Advanced Precision Machining	2
	Advanced Metal Machining Processes	2
	Advanced Mechanical Material Processing	2
	Advanced Technology of Plasticity	2
	Advanced Technical Thermodynamics	2
	Advanced Heat Transfer Engineering	2
	Advanced Fluid Engineering	2
	Advanced Fluid Dynamics	2
	Advanced Mathematical and Numerical Analysis for Environment	2
	Advanced Dynamics of Mechanical Systems	2
	Advanced Robotics	2
	Advanced Autonomous Systems Engineering	2
	Advanced Control Equipment	2
	Advanced Measurement Systems	2
	Advanced Image Measurement Systems	2
	Advanced Computational Mechanics	2
	Advanced Nano-mechanical systems	2
	Special Lecture	4
	○Advanced Exercises in Mechanical and Intellectual Systems Engineering	2
	○Advanced Exercises for Creative Designing toward Problem Solving	2
	○Special Study of Mechanical and Intellectual Systems Engineering	10
	Internship I	1
	Internship II	2
	Cooperative and Interactive Internship Program for Creation	2
	Advanced Lecture for Intellectual Property	2
	Professional Education Lecture	4

Major	Subjects (○ : Compulsory Subjects)	Credits
Life Sciences and Bioengineering	Advanced Molecular Biology	2
	Advanced Radiation Bioengineering	2
	Advanced Pharmacology and Genetic Engineering	2
	Advanced Metabolic Engineering	2
	Advanced Bioinformation Engineering	2
	Advanced Neural Systems	2
	Advanced Biomedical Engineering	2
	Advanced Synthetic Organic Chemistry	2
	Advanced Biomaterial Engineering	2
	Advanced Biochemical Reaction Engineering	2
	Advanced Process Systems Engineering	2
	Protein System Engineering	2
	Special Lecture	4
	Special Seminar on Life Sciences and Bioengineering	4
	○Advanced Exercises of Life Sciences and Bioengineering I	2
	○Advanced Exercises for Creative Designing toward Problem Solving	2
	Advanced Exercises of Life Sciences and Bioengineering II	2
	○Special Study of Life Sciences and Bioengineering	10
	Internship I	1
	Internship II	2
Cooperative and Interactive Internship Program for Creation	2	
Advanced Lecture for Intellectual Property	2	
Professional Education Lecture	4	
Environmental Applied Chemistry	Catalysis and Surface Science	2
	Advanced Lecture for Fine Organic Synthesis	2
	Advanced Industrial Organic Chemistry	2
	Advanced Crystallography for Molecular Solid State Materials	2
	Reaction of Coordination Compounds	2
	Advanced Electroanalytical Chemistry	2
	Advanced Environmental Analytical Chemistry	2
	Colloid and Interface Chemistry	2
	Advanced Computational Molecular Science	2
	Advanced Technology for Synthetic and Medicinal Chemistry	2
	Advanced Analytical and Interfacial Chemistry	2
	Bioengineering	2
	Biomaterial Engineering and Biomedical Science	2

Major	Subjects (○ : Compulsory Subjects)	Credits
Environmental Applied Chemistry	Special Lecture	4
	Special Seminar on Environmental Applied Chemistry	4
	○Advanced Exercises of Environmental Applied Chemistry I	2
	Advanced Exercises of Environmental Applied Chemistry II	2
	○Advanced Exercises for Creative Designing toward Problem Solving	2
	○Special Study of Environmental Applied Chemistry	10
	Internship I	1
	Internship II	2
	Cooperative and Interactive Internship Program for Creation	2
	Advanced Lecture for Intellectual Property	2
	Professional Education Lecture	4
Materials Science and Engineering	Advanced Course of Materials Process Engineering	2
	Reaction Design and Engineering	2
	Materials Forming and Engineering	2
	Materials Science for Controlling of Micro- and Nanostructures in Metals and Materials	2
	Functional Material Design Engineering	2
	Materials Environment and Surface Engineering	2
	Solid State Engineering	2
	Advanced Course of Surface Modification and Engineering I	2
	Advanced Course of Surface Modification and Engineering II	2
	Special Lecture	4
	Special Seminar on Materials Science and Engineering	4
	○Advanced Exercises for Creative Designing toward Problem Solving	2
	○Advanced Exercises of Materials Science and Engineering I	2
	Advanced Exercises of Materials Science and Engineering II	2
	○Special Study of Materials Science and Engineering	10
	Internship I	1
	Internship II	2
	Cooperative and Interactive Internship Program for Creation	2
	Advanced Lecture for Intellectual Property	2
Professional Education Lecture	4	



Instructions for application documents

1. Overall

- (1) Use a black ballpoint pen. Write characters in block style. Please leave the sections with *(asterisk mark) blank.
- (2) Circle the appropriate item for multiple-choice questionnaires.
- (3) Indicate numbers in Arabic numerals.
- (4) The descriptions on the application documents cannot be changed after submission.
- (5) If any fact that is different from the description in the submitted documents is found, the admission of the successful applicant may be cancelled even after the acceptance of admission.

2. Application form, examination admission ticket, and photo ID card

- (1) Names of applicant
Write exactly the same names as those on the “Certificate of Residence (foreigner residents only)” or “Passport.”
- (2) Major and field of education
Please enter the preferred major and field of education, indicated in the “Admission Quota” and “Overview of Master’s program of Graduate School of Science and Engineering for Education”, respectively. You can fill in the columns of the second- and third-choice field of education in the same major. If you do not have more than a preferred field of education, draw a diagonal stroke in other columns.
- (3) Graduating educational institution
Please enter the names of the department (school) and faculty of the graduating university or other educational institution as well as the month and year of (expected) graduation / (expected) completion and circle the corresponding item (s).
- (4) Period of enrollment
Please circle the corresponding period on the admission form, examination admission ticket, and photo ID card.
- (5) Curriculum vitae
Please write the academic and work history of the applicant. As for the academic background, please enter the names of all the schools attended, including elementary school, in chronological order. As for university or equivalent educational institute, please enter the names of the graduate course (department and faculty.)
- (6) Contact address
Please enter the address, telephone number, where the applicant can receive the documents for the admission exam without fail from the time of application to the time of determination of admission. If any change occurs after submitting the application, please immediately notify the Graduate School of the change.
- (7) Examinee ID card/Photo ID card
Please circle the corresponding item (s).