



Hokkaido University
Graduate School of Engineering
Graduate School code : 7

Web site: <http://www.eng.hokudai.ac.jp/e3/>

1. Graduate School code	7	
2. Maximum number of participants	5 Participants per year	
3. Fields of Study	Engineering	
Sub Fields	Civil Engineering, Environmental Engineering, Geology and Mining Engineering, Mechanical Engineering, Materials Science, Applied Physics, Other Engineering Fields	
4. Program and Degree	Program	English Engineering Education program (e3)
	Degree	Master of Engineering
5. Standard time table (Years needed for graduation)	2 years as a Master's Student OR Starting as a Research Student up to 6 months, then 2 years as a Master's Student after passing the exam. (Depend on the capacity of the applicants)	
6. Language of Program	<p>(1) Lecture: All lectures are conducted in English.</p> <p>(2) Text: English</p> <p>(3) Laboratory work: Research is instructed by the supervisor in English.</p> <p>(4) Seminar: Seminars including Japanese students are generally in Japanese, but Japanese students are asked to prepare slides in English, and graduate students often make their presentations in English. Some laboratories conduct seminars fully in English.</p> <p>(5) Thesis Guidance by academic supervisor is regularly conducted in English.</p>	
7. Desirable English level and Necessary Academic background	Linguistic Ability	TOEFL IBT:79, PBT:550, TOEIC 670 or IELTS 6 is required to apply for the regular Master's program. Participant starting as research students can take test during his/her study period as a research student (6 month).
	EJU, IELTS, GRE or else	<ul style="list-style-type: none"> • At least 16 years of academic background or equivalent • GPA 3/4, 80% grades or equivalent
8. Prior Inquiry From Applicants (Before Submission of Application Documents)	Not mandatory (see information of no.10)	
9. Website	(1) English Engineering Education Program (e3) http://www.eng.hokudai.ac.jp/e3/ Graduate School of Engineering http://www.eng.hokudai.ac.jp/english/	
	(2) Hokkaido University	

	https://www.global.hokudai.ac.jp/	
10. Professors and Associated Professors	Name	Research Subject, Contact (e-mail), Special message for the Future students
	Contact Address	E-mail Address for inquiries: eprogram@eng.hokudai.ac.jp If you would like to contact us with any question, please make sure to include the following information in your inquiry. <ul style="list-style-type: none"> • First name, Last name • Email address • Nationality • Field of study • Title of your research plan
	Finding potential supervisor	An important step towards your admission is finding a supervisor whose research topic matches your research interests. Nearly all professors of Graduate School of Engineering participate in the English Engineering Education program. You should look for one or two professors who are doing research that you are interested in conducting and fill their names in in the application form. The best way to find out laboratories' current research activities is to look at their thesis titles during the past five years. List of divisions and laboratories and links to their web-pages, laboratory search by key-word: http://www.eng.hokudai.ac.jp/e3/e3study/divisions *Please note that due to their business some professors may not directly reply to your inquiry. After you have chosen a laboratory of your interest you may contact e3 office, eprogram@eng.hokudai.ac.jp
11. Features of University	<p>Hokkaido University is one of the oldest, largest, and most prestigious universities in Japan. Boasting the largest number of faculties of Japan's national universities, we cover almost all areas of the humanities and social and natural sciences and are leader in research activities in Japan and the world.</p> <p>Our alumni include a Nobel laureate, business leaders, research pioneers, artists, and writers. Our graduates benefit from the University's determination to develop curious minds that are ready to embrace challenges and acquire knowledge, reveal new global perspectives and find solutions which change society for the better.</p> <p>We offer a broad-based educational experience, world-class research facilities, and all the attractions of living in the cosmopolitan city of Sapporo.</p> <p>The atmosphere is warm and welcoming, our campuses clean and safe, and we are located in a breath-takingly beautiful setting.</p>	
12. Features of Graduate School	<p>Engineering has an important role to enrich the future of this planet through the creation and development of science and technology, and significantly contributes to the happiness and welfare of mankind. Faculty of Engineering and Graduate School of Engineering contributes to construction of a safe and peaceful society and to the development of local, domestic and worldwide communities, through the creation of scientific technologies well</p>	

	<p>by our society, technological innovation for the creation of a highly developed society, that is an environmentally harmonized, a high recycling oriented and an advanced information dependent society, and development of new fields in science and technology. The aim of Faculty of Engineering and Graduate School of Engineering is to educate students to be excellent engineers and researchers in the future.</p>
<p>13. Features and Curriculum of Program</p>	<p>English Engineering Education program extends over 12 divisions of Graduate School of Engineering and offers a curriculum of nearly 150 courses in English. Students can enroll in one of the Divisions in April or October. They can carry out their study entirely in English. The usual time to obtain a master's degree and a doctoral degree is two and three years respectively. e3 Student organization with the support of e3 office organizes various academic and leisure extracurricular activities to promote students' communication and to enrich their life in Japan.</p> <p>【Division of Field Engineering for the Environment】</p> <p>This civil engineering division supports the development of engineers and researchers capable of formulating solutions to environmental and natural disaster issues that threaten human societies. Through a well-designed approach with world-class technologies offered by field surveys, wide-area measurement and assessment, experiments with sophisticated equipment and facilities, and numerical simulation, students will graduate with specialized knowledge and skill in related civil engineering subjects.</p> <p>Research Fields:</p> <p>Geotechnical and Material Engineering for Disaster Prevention Cement, sustainability, concrete durability, mineral additives, soil mechanics, geotechnics, geodisaster, soil testing, geodynamics, foundations, numerical simulation, frost geotechnics</p> <p>Hydraulic and Aquatic Environment Engineering Environmental fluid mechanics, hydrometeorology, climate model, coastal hydrodynamics, coastal disaster, renewable energy, fluvial geomorphology, watershed hydrology, river management, turbulence</p> <p>【Division of Engineering and Policy for Sustainable Environment】</p> <p>The Division of Engineering and Policy for Sustainable Environment aims to produce future leaders capable of solving complex environmental and social problems from global perspectives while building consensus with local residents and using methods including system-engineering and socioeconomic approaches. These are intended to create the spaces and environments essential for safe, comfortable and well-developed human activities and harmonization with nature.</p> <p>Research Fields:</p> <p>Engineering for Sustainable Infrastructure System Structural mechanics, structural dynamics, bridge engineering, steel structures, concrete structures, hybrid structures, seismic engineering, life time engineering, life cycle management</p> <p>Policy for Engineering and Environment Infrastructure planning, national and regional planning, urban economics, transportation planning, traffic engineering, public involvement, mathematical programming, traffic information, construction management</p>

【Division of Architectural and Structural Design 】

We aim at fostering human resources who can put the new sophisticated policy and design for social safety-and-sustainability into practice based on acquired skills and field works related to safety mechanisms that support structural and urban spaces, by acquiring critical-thinking and problem-solving abilities on issues related to principles of symbiosis in the environmental spaces of buildings and cities and their design.

Research Fields:

Human Settlement Design

Design concept, modern architecture, documentation preservation, architectural planning, environment behavior, community design, disaster recovery and reconstruction, city planning, sustainable design, design simulations

Structural and Urban Safety Design

Steel structures, seismic protective systems, seismic isolation, seismic retrofit, OpenSees, seismic response analysis, seismic input estimation, vulnerability analysis, human behavioral monitoring, social economic impact analysis

【Division of Human Environmental Systems 】

The human environment consists of the built environment and partly of the natural environment. The human environment, such as residence space, indoor climates, forests and cities, is important for our lives and symbiosis with nature. Building envelopes, building facilities, urban green spaces, city facilities and so on are systems designed to improve properties of the built environment. We carry out research concerning the performance of that environment and systems to heighten the quality level. We also verify the properties under actual service conditions.

Research Fields:

Planning and Performances for Built Environment

Building construction, building material, energy & environment

Building Science and Space Planning

Indoor environment, architectural environment, landscape

【Division of Environmental Engineering】

The Division of Environmental Engineering aims to produce highly specialized professionals with special capabilities essential to build sustainable social systems by conserving the environment and creating safe and comfortable living spaces based on the sound circulation and metabolism of water, air and substances. Such professionals should be furnished with the ability to engage in specialized work and R&D on environment.

Research Fields:

Water Metabolic System

Environmental biotechnology, biofilms, microbial ecology, public health, water quality standard, microsensor, fluoroionophore, lake Mashu, environmental risk engineering, innovative water treatment technology, drinking water guideline

Environmental Management Systems

Solid waste, landfill, thermal treatment, recycling, system optimization, air pollution,

noise pollution, EIA, environmental health, sound material-cycle, bioenergy, soil and groundwater contamination, risk communication

【Division of Sustainable Resources Engineering】

The main research and educational topics of our division is mining engineering including geology, rock mechanics, mineral processing, and extractive metallurgy. We also provide excellent opportunities to study environmental protection and remediation technologies, resources recycling of urban mine, and application of IT and biotechnology, which are needed for sustainable extraction and supply of mineral resources to our society.

Research Fields:

Geoenvironmental Engineering

Rock slope stability, tunnel deformation, acid mine drainage, environmental fluid mechanics, beachrock, biocatalyst, biogrout, microbial fuel cell

Resources Engineering

Mineral processing, resources recycling, environmental mineralogy, water-rock interaction, ore deposit, inorganic material, soft matter, green chemistry, humic substances, CO₂ conversion

【Division of Applied Physics】

Striking advances in nanotechnology, materials science and ultrafast physics are being made regularly in the world today, often ushering in new physical processes. We are boldly riding this scientific wave of the 21st century to investigate phenomena with practical applications ranging from microscopic scales down to molecular and atomic scales.

Research Fields:

Quantum Matter Physics

Complex systems, networks, superconductors, topological materials, topological crystals, graphene, nanotubes, molecular junctions, quantum wells, semiconductors, low dimensional systems, quantum matter, charge density waves, acoustics, phonons, nanotechnology and microscopy, picosecond laser ultrasonics, optics, metamaterials

Complex Material Physics

Nanotechnology, imaging, graphene, neural networks, clathrates, hydrates, cell biology, soft matter, polymers, liquid crystals, colloids, emulsions, rheology, new materials, microstructure, solid state physics, crystals, quasicrystals, diffraction

Optical Science and Technology

Femtosecond, ultrafast, vortex, optical vortex, nanostructures, nanoscience, spin, spectroscopy, condensed matter physics, optical polarization, polarimetry, astronomical optics, extrasolar planets, interferometry

Solid State Physics and Engineering

Semiconductors, nanostructures, quantum computers, spin, interferometry, spectroscopy, crystals, lasers, condensed matter physics, waves, phonons, acoustics, NEMS, metamaterials

【Division of Materials Science and Engineering】

The division provides professional education in cutting-edge materials science, including

material design based on related modeling, material production methods spanning the scale from nano to macro application, ecological processes as environmental system, and ecological and energy materials serving as new functional materials. The division also supports the development of materials science researchers and engineers with the capacity to work independently.

Research Fields:

Ecological Materials

Electromagnetic and novel material processing, CO₂ decomposition, novel nanostructure fabrication, materials recycling by electrochemical process, fuel cell

Materials Design

Strength of ferrous and non-ferrous metals, dendrite growth, phase-field simulation, nanoparticle science for electronic Materials, inorganic-organic nanohybrid materials phase diagram

Energy Materials

High-temperature strength, oxidation resistance alloys and coating, structure materials for fusion reactor, hydrogen storage materials, computational approach, nano-cluster

Energy Conversion Materials

Integration of deterioration of material properties, new feature finding, combustion synthesis of nonstoichiometric compounds, design of new ironmaking system

【Division of Mechanical and Space Engineering】

Students in this division take course subjects in space engineering and cutting-edge mechanical engineering. These subjects, along with research activities in a laboratory the student belongs to, support the development of capability of sound judgment based on problem identification and resolution ability, presentation skills to communicate their ideas, the capacity to independently promote research and technology development, a strong sense of ethics and an international perspective.

Research Fields:

Space Systems Engineering

Space system, space propulsion, spacecraft, hybrid rocket, thermal design, space utilization, International space station, combustion, computational fluid mechanics, aerodynamic design, multi-physics flow simulation

Materials and Fluid Mechanics

Fluid dynamics, two-phase flow dynamics, molecular fluid dynamics, interfacial transport phenomena, mechanical and functional materials, fatigue, surface modification, strength of materials, elasticity and plasticity, instability in solid mechanics

【Division of Human Mechanical Systems and Design】

The division of human mechanical systems and design aims to conduct advanced research on "man-machine" systems that support new life and living by using bioengineering, robotics and control engineering, which are based on mechanical engineering, as well as offering specialized education related to these fields.

Research Fields:

Biomechanics and Robotics

Tissue biomechanics, human movement, medical engineering, assistive technology, motion and vibration control, robot navigation, mobile robot, smart structure, structural health monitoring

Micromechanical Systems

Fluid and solid mechanics, thermal conductivity, composites, functional material, stent, cell mechanics, MEMS, mechanobiology, optimization, static and dynamic analysis, kansei engineering

【Division of Energy and Environmental Systems】

Our division is engaged in research and education on advanced energy systems through research on hydrogen fuel cells, next-generation engine systems, and innovative device for measurement and control of thermo-fluid phenomena, together with research and education on the evolution and development of future nuclear energy technologies including innovative nuclear systems, nuclear power plant safety, reactor physics, and radioactive waste management.

Research Fields:

Applied Energy Systems

Applied energy systems, energy conversion systems, flow control, applied thermal engineering engine system engineering, internal combustion engine

Nuclear and Environmental Systems

Nuclear and environmental systems, nuclear reactor, nuclear safety and system engineering, nuclear waste management, boiling heat transfer

【Division of Quantum Science and Engineering】

The research activities of this division cover a wide area of physics and engineering for the quantum beam science and the plasma. Based on the fundamental study of these research fields, we are aiming for state-of-the-art materials characterization and fabrication techniques, medical-care and cancer therapy equipment, new devices for energy generation and saving, environmental monitoring technique, etc.

Research Fields:

Applied Quantum Beam Engineering

Neutron generation, neutron scattering / imaging, quantum beam, radiation detection / measurement, nuclear instrumentation, medical physics, proton therapy, neutron capture therapy

Plasma Science and Engineering

Plasma processing, plasma diagnostics, laser ablation, laser processing, plasma-surface Interactions, fusion engineering, vacuum engineering, simulation of electro-magnetic field in plasma

Nanomaterials Science

Quantum beam irradiation effects, in-situ observation, nuclear materials, transmission electron microscope, synchrotron radiation, surface science, well defined catalysis

<p>14 . Academic Schedule</p>	<p>(Spring semester)</p> <ul style="list-style-type: none"> • Late March/Early April <p>New students arrival in Japan</p> <ul style="list-style-type: none"> • April <p>Orientation for new students Course registration for Spring semester Spring semester/1st quarter classes begin Students regular health check-up</p> <ul style="list-style-type: none"> • Beginning of June <p>Hokkaido University Festival (3 days) 1st quarter classes end 2nd quarter classes begin</p> <ul style="list-style-type: none"> • August <p>Spring semester/2nd quarter classes end, summer break begins < Entrance Examination for October admission > Thesis defenses of Master's and PhD students graduating in September E3 field trip</p> <ul style="list-style-type: none"> • September <p>E3 sports festival Graduation ceremony E3 graduation party Summer break ends</p> <p>(Autumn Semester)</p> <ul style="list-style-type: none"> • Late September/Early October <p>New students arrival in Japan</p> <ul style="list-style-type: none"> • September <p>Orientation for new students Course registration for Autumn semester Autumn semester/3rd quarter classes begin</p> <ul style="list-style-type: none"> • October <p>E3 Welcome trip Engineering Faculty Cultural Festival (1 day) E3 Career Orientation</p> <ul style="list-style-type: none"> • November <p>Graduate School of Engineering International Students Welcome party</p> <ul style="list-style-type: none"> • Beginning of December <p>3rd quarter classes end 4th quarter classes begin</p> <ul style="list-style-type: none"> • End of December <p>E3 New Year party</p>
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	<ul style="list-style-type: none"> • End of December - Beginning of January Short winter break • January Career seminar • February Autumn semester/4th quarter classes end, spring break starts < Entrance Examination for April admission > Thesis defenses of Master's and PhD students graduating in March • End of March Graduation ceremony E3 graduation party Spring break ends
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15. Supporting service to International Students

<p>International Students Support Center for Consulting or counseling about daily life, campus life, cross-cultural adjustment etc.</p>	<ul style="list-style-type: none"> ◆ Institute for International Collaboration In 2016, Hokkaido University launched the Institute for International Collaboration(IIC) in an organizational restructuring effort designed to further promote internationalization in education and research. The office is now a ‘one-stop shop’ to get information and guidance on a wide range of issues that were previously separate in location and authority. For further information, please visit <https://www.global.hokudai.ac.jp/international-affairs/institute-for-international-collaboration/> ◆ Health Care Center The Health Care Center, located in the center of campus serves students primary health care needs. The staff includes physicians, nurses, counselors and administrative staff members. For further information, please visit <https://www.global.hokudai.ac.jp/about/facilities/hospitals-and-health-and-childcare/health-care-center/> ◆ International Student Support Desk Institute for International Collaboration (IIC) provides a support desk with International students who can answer questions. If international students have trouble reading Japanese documents or do not understand procedures at the ward office or just want to know where to go shopping, they can talk to multilingual staff at the Support Desk. For further information, please visit <https://www.global.hokudai.ac.jp/prospective-students/discover-campus-life/keep-informed/> ◆ IIC Counselling Room The Institute for International Collaboration (IIC) provides counseling services to international students. To meet the unique needs of international students, counseling sessions deal with wide ranging issues. The IIC counselor will help students make their own decisions to resolve these difficulties. For further information, please visit https://www.global.hokudai.ac.jp/current-students/health-and-wellness-2/counselling/ ◆ e3 coordinator Designated coordinator provides advisory to e3 students and monitors they study and research environment.
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	<p>◆International Affairs Office of Engineering Friendly English-speaking staff assist students with administrative procedures and everyday life matters.</p> <p>◆Student Support Desk At the Student Support Desk, experienced international students provide consultation and can answer any questions you may have. Support provided in Japanese, English, and other languages.</p> <p>◆Counselling Service The IIC counselor can help you resolve your difficulties and provide you with professional advice.</p> <p>Language : Japanese or English</p>
<p>Provision of Student Dormitory</p>	<p>Hokkaido University has 757 rooms in 7 dormitories in Sapporo, and 30% of international student lives in a dormitory. All new students can live in a dormitory at least six months, so that students do not have to worry about looking for a place to stay upon arrival in Sapporo. All of Hokkaido University's dormitories are located within walking distance from Sapporo Campus, and are fully furnished with internet access.</p> <p>Hokkaido University has seven dormitories, five of which are located in and near Sapporo Campus. Most students live in single rooms, however accommodation for married couples as well as families is also available. Some dormitories are single-sex; others unisex, some mix Japanese students with international students, others are purely for international students. All dormitory rooms are fully furnished; high speed internet access is provided.</p> <p>https://www.global.hokudai.ac.jp/prospective-students/accommodation/dormitories/</p> <p>Housing Information</p> <p>◆Guarantor System Generally, a guarantor is required when renting a house or apartment in Japan. Hokkaido University can become the guarantor, if international students have difficulties in finding a personal guarantor when applying to rent an apartment. Please refer to the website for details.</p> <p>https://www.global.hokudai.ac.jp/prospective-students/accommodation/renting-privately/</p>
<p>Japanese Language Education Program for International Students</p>	<p>The Center for International Education and Research offers a General Japanese Course for international students. Classes are offered at 8 levels: Introductory 1-4, Intermediate 1-3 and Advanced and each level contains the following subjects:</p> <ul style="list-style-type: none"> - Introductory: Grammar, Oral Skills, Kanji/ Vocabulary - Intermediate: Interaction (Basic and Practical), Expression (Basic and Practical), Comprehension (Basic and Practical), - Advanced: Interaction, Expression, Comprehension <p>Students are free to choose the unit of study according to their needs; however, class levels will be determined on the basis of a placement test and on the previous study of Japanese. Application and placement test can be done online.</p> <p>The Center for International Education and Research offers Japanese Language classes in various levels from introductory level for beginner to advanced level aiming for job hunting. Classes are offered at 8 levels: Introductory 1/2/3/4, Intermediate 1/2/3 and Advanced. At Introductory level, there are following classes; Grammar, Kanji & Vocabulary, Oral Skills. At Intermediate level, there are following classes; Comprehension, Interaction, Expression. At Advanced level, there are following classes; Comprehension, Interaction, Expression, and Business Japanese. International students are free to choose the unit of study according to their needs, but class levels will be determined based on the placement test score.</p> <p>Please refer to the website for details.</p>

<p>Cultural Activities</p>	<p>“e3 field trip” is academic and recreational activity organized once a year by e3 office and e3 student’s organization. During the 2-3 days trip international and Japanese students of e3 program visit various locations in Hokkaido and learn about Hokkaido industry, history and culture and interact between each other. In Autumn, e3 also organizes a one day welcome trip for new comers to interact with current students.</p> <p>The Institute for International Collaboration offers many kinds of cross-cultural events and cultural exchange opportunities which are open to international students, international researchers, their families, Japanese students, and University staff.</p> <p>‘Zen Seminar’ is a cross-cultural program, conducted by the Institute for International Collaboration in spring and autumn. In this program, international students and Japanese students from Hokkaido University spend two days together at a temple and hold various group activities, focusing on cross-cultural understanding. In addition, students also take part in Zen meditation and Japanese culture experiences.</p> <p>The Institute for International Collaboration also offers a two-day trip called ‘Holiday in Hidaka’. It aimed at international communication between Japanese and International students of Hokkaido University, in the relaxed and beautiful setting of Hidaka.</p>
<p>Any special attention to Religious Practice</p>	<ul style="list-style-type: none"> ◆Halal foods available at the cafeteria. ◆Prayer room in Institute for International Collaboration.
<p>facilities (Library etc)</p>	<ul style="list-style-type: none"> ◆Libraries Hokkaido University has two main libraries: Main (Central) Library, and North Library, as well as departmental libraries. For more information click here (https://www.global.hokudai.ac.jp/current-students/academic-support/libraries/) or go directly to the library website (http://www.lib.hokudai.ac.jp/en/) . For further information, please visit : http://www.lib.hokudai.ac.jp/en/ ◆Opening of Sports Facilities While the sports facilities are used mainly for curricular and extracurricular activities, they are also open to students and faculty members of the university. For details, please contact the person in charge of extracurricular activities of the Student Support Division (Office of the Student Center for Extracurricular Activities). For further information, please visit < https://www.global.hokudai.ac.jp/current-students/sport-and-recreation-2/>
<p>Please state other particular supporting service you are endeavoring, if any.</p>	<ul style="list-style-type: none"> ◆Career Support e3 organizes English career orientation for new coming international students in October, and invites e3 alumni students to introduce their career passes and job-hunting experience (in January). The Career Center provides various job search support including resume critique, mock interviews, career advice, and seminars. For further information, please visit < https://www.global.hokudai.ac.jp/current-students/career-2/> ◆e3 Student’s Organization (Only for English Engineering Education Program) Every year students of English Engineering Education program elect their own representatives, who are in charge of organizing cultural and academic events for the students. Traditional events organized by students are: welcome parties, graduation parties, sports festival, field trip, workshops with invited speakers, cooking contest and others. Most of the students are involved in the activities of the Student’s organization as members of working groups. “SO” promotes cultural exchange and mutual understanding, and also creates a platform for the development of student’s leadership skills. ◆Supporter System

	The International Student Supporter System is designed to provide assistance to first-comers to Sapporo to ensure that International Students commence their lives in Hokkaido smoothly.
16. Message to Prospective International Students	
Message from University	https://www.global.hokudai.ac.jp/about/presidents-welcome/
Voice of International Students	<p>Thanks to e3 program, I can study in the country, which culture always fascinated me, in English. My research is related to the conservation efforts for heritage buildings in Malioboro Street, Yogyakarta, Indonesia. Applying Japan's successful experience in protecting their cultural heritage, I hope to contribute to the improvement of the cultural heritage regulation in Indonesia.</p> <p>During the laboratory projects, team work is very important. At first, it wasn't easy to adapt to my Japanese lab mates' working style and way of communication, but I could learn how to see things from a different perspective. (Safiera Nur Septirina / Indonesia)</p> <p>Besides having classes and doing research, the campus life is very colorful, like field trips, parties, culture salon. The best is that e3 and Hokkaido University provides many chances for international students to communicate with each other and experience culture of different countries. I really enjoy living and studying here. (Ma Yan / China)</p>