



For Students Taking Liberal Arts and Common Subjects

Center for General Education



Toward the Realization of a Sustainable Society

In order to work in the real world where we face the various challenges of humanity, engineers are required to have a well-balanced combination of "well-rounded education" and "high-level professional skills."

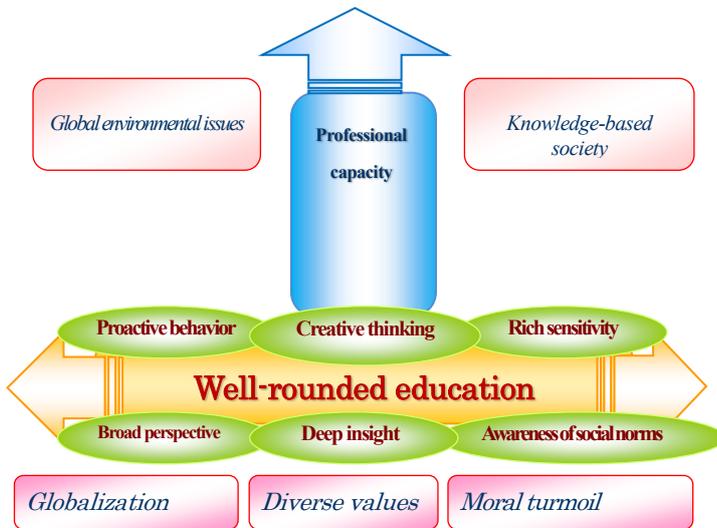


Figure 1: Importance of liberal arts education in today's society

- Various human activities have become increasingly complex and grown in scale, supported by science and technology. Additionally, globalization of every aspect of our lives is under way. This has given rise to the crisis of global warming, conflicts among diverse values, regional conflicts, and the threat of terrorism.

- In the 21st century, new knowledge and information technology are becoming increasingly important as the basis for activities in all areas of society. In this knowledge-based society, human beings are required to pool their wisdom, establish social morality, live in harmony with nature, and cooperate with the international community.

In these times, it is necessary to have a **well-rounded education that supports self-establishment by clearly indicating what new morals our future society, and the individuals who will live in it, will have.**

The liberal arts of the new age must enable us to develop an awareness of social norms and ethics, a rich sensibility, the ability to think creatively and to act independently, and physical and mental strength, in addition to a broad perspective and deep insight backed by knowledge. In general, we aim to cultivate and nurture a well-balanced combination of "intellect, virtue, and body" and "intellect, emotion, and will."

Liberal arts education is one of the two pillars of university education.

The enrichment of expertise is the primary focus of graduate school education, while undergraduate education puts emphasis on liberal arts and fundamental education in preparation for their specialization.

Liberal arts education not only provides a wide range of knowledge, but also cultivates the foundation of interpersonal and social skills.



Figure 2: Position of liberal arts education in universities

Our university aims to **foster highly-skilled engineers who will be leaders in their field** through an integrated education that spans six years from undergraduate to graduate levels (or four years from the third year of undergraduate school). We have put in place a **unique curriculum for liberal arts education** (including language education), which **enables students to acquire the following skills throughout these years.**

- Knowledge to understand the various circumstances surrounding technical science, including human beings, society, industry, and nature.
- Awareness of social responsibility as an engineer
- A variety of skills required for engineers in a globalized and information-oriented society
- Ability to constantly train and improve oneself amid important social changes
- Ability to explore new fields based on a deep understanding of natural science
- Skills required for leading high-level engineers in companies and society

Goals of Liberal Arts Education at the University: From the Perspective of Developing Leading High-Level Engineers

The university's liberal arts education aims to develop the following abilities (3 x 3) in leading engineers. The following is a list of goals and the corresponding subjects, so that you can take them systematically throughout your undergraduate and graduate studies.

Ability to create new ideas in technological science flexibly from many perspectives	A. Acquisition of the concepts and techniques of science, mathematics and data science that support technology
	B. Understanding technology from the perspectives of life, humanity, and society
	C. Ability to understand and conceive technologies that integrate multiple areas of expertise
Strategic technology management	D. Acquisition of language and logical thinking abilities that form the foundation of understanding, thinking, expression, and dialogue
	E. Ability to consider the effects of technology on safety, environment, and culture
	F. Ability to support penetration into global trends of society and industry and which support strategic technology management
Leading international engineer	G. Acquisition of the basic ability of technical communication in English
	H. Development of a cosmopolitan mode of thinking and the ability to cooperate on an international team
	I. Acquisition of the ability to engage in international competition in a fair manner as a leading international engineer

In particular, in order to achieve the sustainable development goals (SDGs), we develop human resources in STEM (Science, Technology, Engineering, Mathematics → to train engineers capable of making effective use of data science and artificial intelligence (AI) and equipped with cross-disciplinary and interdisciplinary knowledge), STEAM (STEM + Art/Arts → to develop engineers capable of responding to social change from a broader perspective and demonstrating management skills), and other subjects in “Information,” “Economics and Management,” “Environment,” and “Safety” categories. Related courses are indicated by color (required courses, elective courses, and recommended courses).

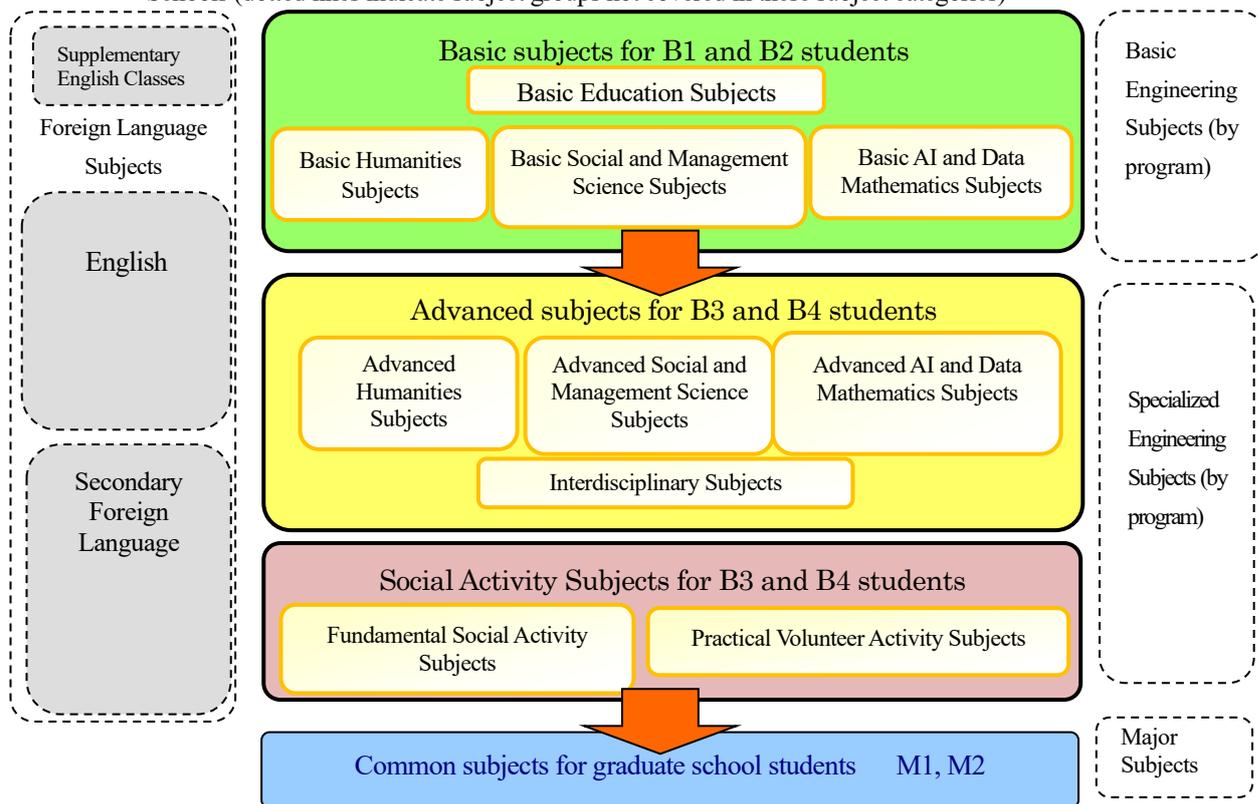
	Education Contents	Master' s Program	B3,B4	B1,B2
A	Mathematics Science AI, Mathematical & Data Science	Modern Mathematics Theory of Mathematical Analysis	Data Science A ~ EI • II	Exercise in Basic Mathematics 1,2 Basic Physics, Basic Chemistry, Basic Biology Introduction to Mathematical Modeling, Data Science, and Artificial Intelligence Information Processing
B	Life, Body and Technology Humanity and Technology Society and Technology	Sports Bio-mechanics Social Welfare Introduction of Cognitive Science Language and Thought Advanced Psychology	Sports Methodology for Total Fitness SDGs in the latest high performance sport science Introduction to Social Welfare Interactive System Design Introduction to Psychology Introduction to Design History of Art Theory of Art	Physical Education 1,2
C	Multidisciplinary Technology			
D	Power of Expression and Composition Reporting, Presentation and Debate Knowledge, Thought and Information		Japanese Technical Writing Logic and Thought Newspapers in the Information Age	Exercises in Japanese writing and speaking Exercises in Writing Research Papers Introduction of Information Retrieval Language and Communication
E	Technology and Safety Technology and Environment Technology and Culture Engineering Ethics	Advanced Safety Engineering Science and technology in modern society	Earth Environment and Technology Engineering Ethics	Introduction to Global Environmental Studies Life and Ethics
F	Economy and Management Industry and Entrepreneurship Innovation, Scientific and Technological Society Intellectual Property	Energy and Economy in Japan Advanced Business Management Practical work on venture flotation training 1 Practice of Idea Development Japanese Industrial Development and SDGs Gigaku Innovation and Creativity An outline of Intellectual Property	Macroeconomic Analysis Management Engineering Introduction to Marketing Business and Management Regional Management Local Industry and Globalization History of Science History studies from technological perspective Special Lectures for GIGAKU Innovation 1, 2 Technology Development and Intellectual Property Right	Micro Economics
G	English Reading and Writing Reporting, Presentation and Debate in English Business English for Engineers	Technological English English for Academic Purposes Analytical Reasoning and Presentation Professional Discourse and Presentation Fundamental English for Graduate Students English for Science and Technology		
H	Societies and Cultures in Japan and in the World Multicultural and Multilateral Understanding Teams, Leaders and Practical Skills	Language and Understanding of Other Culture Cross-cultural Mapping: Developing Your Cultural Awareness Characters in modern Japanese literature Social Skills Considering from Diversity Role of Creativity and Leadership Development in Enterprise and Business	Introduction to EU Cultural Affairs Society and Culture History of the East Japanese Modernization and Western Civilization Japanese Philosophical Development History of Cultural Exchange History of international Relations of Japan Global Communication Foundation of Volunteer Activity Practical Volunteer Activity Working adults necessity learned from education within enterprise Practical ability developed through Go Engineering Design	History and Culture History of Social Developments Philosophy and Value Literature and Human Image Education and Learning Construction and Change in Modern Society
I	Law and Justice Organization and Problem Solving	Compliance of Corporation International Relations	Introduction to Legal Mind Politics	The Constitution of Japan and Modern Society
J	(Multiple contents)	SDGs -recognizing limitations and challenges Introduction to the SDG Practice	Introduction to the SDGs	

About the Curriculum

Undergraduate liberal arts subjects are categorized according to disciplines and subject levels as shown below.

Subject category	Target year of study	Number of subjects	Goals and examples of subjects or subject areas
(1) Basic Education Subjects	B1, B2	9	The aim is to acquire the fundamental skills to understand the various circumstances surrounding the technical sciences. The subjects consist of basic lectures and practical sessions in mathematics, physics, chemistry, and biology, exercises in Japanese language expression and report writing, and physical education.
(2) Basic Humanities Subjects	B1, B2	7	We provide students with a basic knowledge of human nature and ways of being, with a focus on cultural activities. The subjects include philosophy, ideas, history, literature, and pedagogy.
(3) Basic Social and Management Science Subjects	B1, B2	5	Students are encouraged to acquire basic knowledge, etc., to consider social systems, order, and social norms, with a focus on social and economic activities. The fields of study include law, economics, sociology, environmental studies, and informatics.
(4) Basic AI and Data Mathematics Subjects	B1, B2	2	The goal is to acquire basic knowledge in the field of AI and information technology that supports social, economic, and cultural activities. Students take courses such as AI and information processing.
(5) Advanced Humanities Subjects	B3, B4	14	In addition to learning advanced subjects in the humanities, students will cultivate their methods of thinking and expression, deepen their understanding of various cultures, and develop the ability to play an active role in international society. Courses include art and design, cultural theory, media theory, and psychology.
(6) Advanced Social and Management Science Subjects	B3, B4	9	In addition to taking subjects in advanced social and management science, students will develop the ability to apply technical science to society and to explore new technical science fields that society needs. This includes political science, business administration, intellectual property rights, and social welfare.
(7) Advanced AI and Data Mathematics Subjects	B3, B4	6	In view of the basic understanding of AI and information technology, students acquire the knowledge and skills to apply these technologies in their specialized fields through data science subjects in each field.
(8) Interdisciplinary Subjects	B3, B4	13	We aim to foster creativity and practical skills to develop new fields of technical science through complex and interdisciplinary approaches. The courses cover engineering ethics, global environment and technology, history of science, health and sports science, and cognitive science.
(9) Fundamental Social Activity Subjects	B3, B4	2	Students are expected to be aware of their responsibilities as members of society, and to acquire practical knowledge regarding volunteerism and business skills, which will be the basis for being proactively involved in social activities.
(10) Practical Volunteer Activity Subjects	All students	1	Students cultivate independence, proactivity, and the ability to find and solve problems by contributing to society through volunteer activities.

Figure 3: Curriculum for Liberal Arts and Common Subjects in Undergraduate and Graduate Schools (dotted lines indicate subject groups not covered in these subject categories)



B1, first year undergraduates; B2, second year undergraduates; B3, third year undergraduates; B4, fourth year undergraduates; M1, first year Master's students; M2, second year Master's students

Advice for Liberal Arts and Common Subjects



For first-year undergraduate students

- **The number of credits in liberal arts subjects that must be earned during the first and second academic years**
Students acquire 14 credits from the subjects of the Basic Subjects Group: Basic Education Subjects, Basic Humanities Subjects, Basic Social and Management Science Subjects, and Basic AI and Data Mathematics Subjects.
- **There are two compulsory subjects in the first and second academic years: Physical Education I and Introduction to Information Processing**
Physical Education I is offered in the first semester of the first academic year. Physical Education II, offered in the second semester of the second year, is an elective course. Introduction to Information Processing is offered in the first semester of the second year.
- **If you are worried about your basic skills in science and mathematics or the Japanese language, pay attention to Basic Education Subjects**
Each subject corresponds to one credit and is offered in the first semester (or second semester in some cases) of the first academic year. There are subjects in mathematics, physics, chemistry, biology, and basics of the Japanese language, and up to four credits, including the compulsory Physical Education I, can be counted toward graduation requirements.
- **Be careful when taking elective compulsory subjects related to economics and management**
Students must earn two credits (one subject) from subjects related to economics and management before graduation. One course (Micro Economics) is offered as a basic subject, and six courses are offered as advanced subjects. There is a limit to the number of advanced subjects that students can take. Please check the contents of each subject and consider the year and semester it would be best for you to take the subject to ensure that you can complete it.
- **When selecting subjects, consider a balanced and multifaceted approach**
Students should be aware of the skills they need to acquire during their school years for their future, and should select subjects in a well-balanced manner from among Basic Education Subjects, Basic Humanities Subjects, Basic Social and Management Science Subjects, and Basic AI and Data Mathematics Subjects.
- **Be conscious of STEM/STEAM learning**
There has been an increasing emphasis on learning, in Science, Technology, Engineering, and Mathematics (STEM) as well as the Art/Arts (STEAM), to help students discover new, practical, concrete problems and develop solutions. This is important for taking on the challenges related to SDGs as proposed by the United Nations for the realization of a sustainable society. Let's be aware of this kind of learning.
- **Plan your course of study, including intensive lectures**
In addition to the regular weekly courses, some courses are offered in the form of intensive lectures, depending on the availability of external lecturers. When planning your course of study, please make use of the intensive lectures in addition to earning credits from the weekly courses.
- **Students can take courses offered in the third and fourth academic years ahead of time**
Students may take Advanced Subjects and Social Activity Subjects during the first and second years with the approval of the course instructor in charge (advanced subjects shown above designated as subjects related to economics and management cannot be taken ahead of time). The credits earned will not be included in the 14 credits required to advance to the third academic year, but can be included in the 14 credits of the liberal arts subjects to be taken in the third and fourth academic years.
- **Participate in volunteer activities**
In today's society, various social activities are increasingly supported by volunteers from NPOs and NGOs. In addition, there is a growing tendency in society, including at the time of employment examinations, to appreciate volunteer activities. At the University, students can receive credits for their participation in organized volunteer activities (outside of graduation requirements). As a general rule, students are required to declare their participation at the beginning of each academic year, but in the case of disaster recovery volunteer activities, for example, it is possible to receive credits after participation.

For first-year Master's/Doctoral (Technology Innovations) course students

- **The number of credits in common subjects that must be acquired during the first and second years (Master's and Doctoral Schools [Department of Science of Technology Innovation])**
All common subjects are elective, except for subjects for course students, and a minimum of 6 credits must be earned.
- **Earn credits for overseas experience related to education and research activities**
Credits for "Cross-cultural Mapping: Developing Your Cultural Awareness" will be awarded based on a total of 2 months or more of overseas experience (applicable only to educational and research activities conducted at a graduate school). In order to acquire credits, students must attend 3 lectures (intensive) and submit a report before departing for the overseas experience. Therefore, students intending to acquire credits for this subject should take these lectures in advance. The course schedule will be posted.

Notice for both undergraduate and graduate school students

- **Note that the number of students enrolled in some courses may be limited by lottery**
The number of students enrolled in some classes will be limited for reasons such as ensuring educational and student capacity standards during classes. Selection will be done by lottery, so please check the bulletin board.
- **Acquisition of Teacher's License Certification**
Please ask the Section of Educational Exchange of the Division of Academic Affairs.

