This is an English translation of 「学修案内」. If there is a difference between the original Japanese version and the English version, the Japanese version will take precedence.

Study Guide

1. Introduction

(1) Schools and undergraduate majors

Here at Tokyo Tech, the undergraduate majors in each School are as follows.

School	Undergraduate major
School of Science	Undergraduate Major in Mathematics
	Undergraduate Major in Physics
	Undergraduate Major in Chemistry
	Undergraduate Major in Earth and Planetary Sciences
School of Engineering	Undergraduate Major in Mechanical Engineering
	Undergraduate Major in Systems and Control Engineering
	Undergraduate Major in Electrical and Electronic Engineering
	Undergraduate Major in Information and Communications Engineering
	Undergraduate Major in Industrial Engineering and Economics
School of Materials and Chemical Technology	Undergraduate Major in Materials Science and Engineering
	Undergraduate Major in Chemical Science and Engineering
School of Computing	Undergraduate Major in Mathematical and Computing Science
	Undergraduate Major in Computer Science
School of Life Science and Technology	Undergraduate Major in Life Science and Technology
School of Environment and Society	Undergraduate Major in Architecture and Building Engineering
	Undergraduate Major in Civil and Environmental Engineering
	Undergraduate Major in Transdisciplinary Science and Engineering

(2) Courses and studies

Course categories

The courses here at Tokyo Tech can be divided into the liberal arts course group and the core course group. The categories of those courses are as shown in the table below.

Course group	Course categories	Course content, etc. in bachelor's degree program	Course number
Liberal arts course group	Humanities and Social Science Courses	Humanities, Social Studies, and Transdisciplinary Studies Courses	100–300-level
	English Language Courses	English	100–300-level
	Second Foreign Language courses	German, French, Russian, Chinese, Spanish, Italian, Korean, Classical Greek, Classical Latin	200–300-level (Some courses are numbered 100–199)
	Japanese Language and Culture Courses	Courses for the education of international exchange students	100–200-level
	Teacher Education Courses	Teacher education courses for acquisition of teaching certificate under the Educational Personnel Certification Law	100–300-level
	Breadth Courses	Wellness Courses, Global Awareness and other Breadth Courses	100–300-level
	Basic Science and Technology Courses	Mathematics, Physics, Chemistry, Life Sciences, Earth and Space Sciences, Descriptive Geometry, Computing and Information Science, Environmental Education, Frontiers of Science and Technology, Creativity Development	100-level
Core course group	Major Courses	Creative Process Courses, First-Year Courses	100-level
		Common Courses, Undergraduate Major Courses	200–300-level
	Research-Related Courses	Research Opportunity Courses, Independent Research Project for bachelor's degree, Advanced Independent Research Project for bachelor's degree	300-level

Course numbering and course numbers

Every course is assigned a course number to indicate the level of study, its order in a sequence, etc., as well as to clarify the systematic structure of the educational program. This is the course numbering. Bachelor's degree program courses have 100-level, 200-level, and 300-level course numbers. (In graduate school, courses for the master's degree program are at the 400-level and 500-level, while courses for the doctoral second-stage program are at the 600-level.) (See p. 19)

Achievement-based assessment

Following the curriculum organized systematically by this course numbering system, you will be taking courses that embody the progress of your achievement. Students receive an achievement-based assessment for each course (a passing score is 60 points or more out of a perfect score of 100 points) and checks will also be made at every stage from department affiliation, to the start of an independent research project for a bachelor's degree, to graduation, to check their achievement in terms of necessary credits and other requirements satisfied.

Competencies to acquire

Tokyo Tech has defined five competencies that students are to acquire in line with the model image of the competent person being developed and in accordance with educational policy. Those five competencies are shown in the syllabi for each undergraduate major.

・Specialist skills

Fundamental specialist skills

Fundamental expertise to conduct research and development

・Liberal arts skills

Cultural skills and independent study

Broad knowledge and language skills necessary to comprehensively grasp matters

Ability to learn and think for oneself

Willingness to challenge the unknown

Understanding of ethical issues

・Communication skills

Logical explanations and mutual respect

Skills necessary to provide logical explanations

Ability to achieve mutual respect and understanding among team members

・Applied skills (inquisitive thinking and/or problem-finding skills)

Organization and analysis

Ability to organize phenomena from a multifaceted perspective and analyze them logically

・Applied skills (practical and/or problem-solving skills)

Basic problem solving

Ability to solve fundamental problems using knowledge, skills, and creativity

Academic semesters and quarters

The academic year at Tokyo Tech starts on April 1 and ends on March 31 of the following year. That part of the year from April to a day in the fourth or fifth week of September that is determined every academic year by the president is the spring semester. From the day after the end of the spring semester to March is the fall semester. Each semester is further divided into a first half and second half, which are quarters. As a rule, courses are held by quarter, with most courses ending in one quarter.

The courses and final exams in a quarter are generally held from early April to early June in the first quarter, from early June to early August in the second quarter, from late September to late November in the third quarter, and from late November to early February of the following year in the fourth quarter. The specific dates are announced every academic year on the website and in other media.

Semesters	Spring semester		Fall semester	
	April to the fourth or fifth week in September		Day after the last day of spring semester to March	
Curriculum	First quarter (1Q)	Second quarter (2Q)	Third quarter (3Q)	Fourth quarter (4Q)
	Early April to early June	Early June to early August	Late September to late November	Late November to early February of the following year

You will advance in your studies by referring to this Study Guide and the timetable as you set up your study plans. Your course studies will generally proceed in the following order:

1st year of admission: (Before joining a department) All students alike mainly take 100-level humanities and social science courses, English language courses, basic science and technology courses, breadth courses, and First-Year Courses. The courses taken here have to satisfy the credit requirements for department affiliation one year after admission. Courses at the 200-level and higher cannot be taken during the year of admission.

2nd year of admission: (Study takes place by undergraduate major) 200-level humanities and social science courses, English language courses, second foreign language courses, and breadth courses are taken. Students also become affiliated with a department and take the major courses (basically 200-level courses) for the standard curriculum of the undergraduate major.

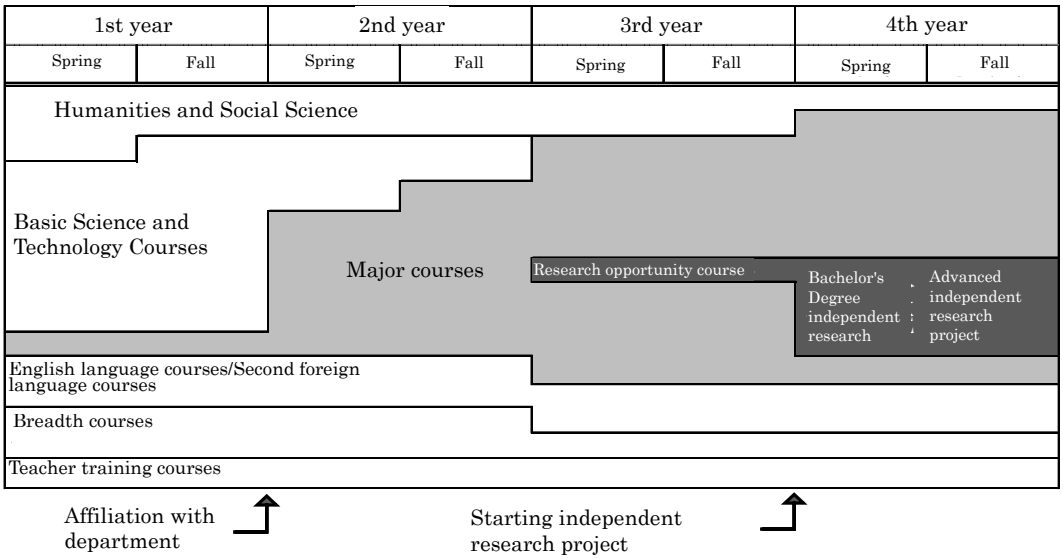
3rd year of admission: (Study takes place by undergraduate major) Students take further 200–300-level humanities and social science courses, English language courses, second foreign language courses, breadth courses, and major courses in the undergraduate major, and also take research opportunity courses. Students are also recommended to pursue Study Abroad or other such international experience from the second quarter into summer vacation.

4th year of admission: (Study takes place by undergraduate major, laboratory) Students mainly take major courses in the undergraduate major and also conduct an independent research project for a bachelor's degree. When there is a further period of enrollment left before graduation after completing an independent research project, students can proceed with an advanced independent research project for a bachelor's degree.

Note: In the case where students graduate one year early (see section 6. Early graduation), students must take research opportunity courses in the first quarter of their third year, and conduct an independent research project in the fall semester of the same year. To graduate in three years and six months, students must complete research opportunity courses by the end of the fall semester of their third year and conduct an independent research project in the spring semester of their fourth year.

Students wishing to acquire a teaching certificate for lower secondary school or upper secondary school must take separately prescribed teacher training courses. In graphic form, the courses taken above will generally be in the proportions shown in Table 1.

Table 1. Relationship between semester and main courses taken (wedge-shaped pattern of education)



Number of credits that should be earned before graduation

The minimum required number of credits that should be earned after admission and before graduation is shown in Table 2 and Table 3. The preferable numbers of required course credits to be earned by semester are shown in Table 4.

Earning the credits requires proceeding systematically with your studies, allocating courses by semester and quarter. The fourth year of admission, in particular, is when the independent research project for a bachelor's degree is conducted, so you must plan to fully acquire the specialized academic skills that will be required for the research by that time.

Consulting with your academic advisor should be useful for pursuing the studies described above.

Study Abroad, international experience, and English language proficiency

There are some major fields at Tokyo Tech that have a curriculum designed to include Study Abroad or international experience as a requirement to be met during the period from admission to a bachelor's degree program to the conclusion of a master's degree program. The period from July to September in particular is intended to facilitate Study Abroad. Therefore, the bachelor's degree program basically does not have any required courses assigned to the second quarter in the third year of admission. In a master's degree program, major courses are as a rule conducted in English. There are also courses or classes held in English in the curriculum of the bachelor's degree program. It is important, therefore, to take such courses and actively improve your English language proficiency while you are still in a bachelor's degree program.

Table 2. Minimum number of credits required by graduation

Category / Courses	Minimum number of credits required			
	Eligibility for department affiliation		Eligibility for independent research project for a bachelor's degree	Eligibility for graduation
Humanities and Social Science Courses	A total of 5 credits consisting of 2 credits in 100-level required courses 3 credits in 100-level restricted elective courses (1 credit each from the humanities, social studies, and transdisciplinary studies)	31 credits ・A total of 31 credits consisting of 17 credits from the total of 23 credits shown in the column to the left and, including those to the left, credits in 100-level courses (excluding separately prescribed courses)	9 credits ・2 credits in 100-level required courses ・3 credits in 100-level restricted elective courses (one credit each from humanities, social sciences, and transdisciplinary studies) ・4 credits from 200-level and 300-level required courses and restricted elective courses	13 credits ・2 credits in 100-level required courses ・3 credits in 100-level restricted elective courses (1 credit each from humanities, social sciences, and transdisciplinary studies) ・4 credits in 200-level restricted elective courses ・2 credits in 300-level required courses ・2 credits in 300-level restricted elective courses
English Language Courses	A total of 4 credits in 100-level required courses		6 credits ・4 credits in 100-level required courses ・2 credits in 200-level ~~and~~ 300-level required courses	9 credits ・4 credits in 100-level required courses ・4 credits in 200-level required courses ・~~2~~ 1 credits in 300-level required courses
Basic Science and Technology Courses	A total of 14 credits in 100-level required courses		14 credits ・14 credits in 100-level required courses	14 credits ・14 credits in 100-level required courses
Second Foreign Language Courses	—		2 credits ・200-level and 300-level restricted elective courses Students will be asked to choose one or two languages to study. 2 credits can be attained by learning the same language, or by learning two different languages (1 credit each).	4 credits ・200-level and 300-level restricted elective courses Students will be asked to choose one or two languages to study. 4 credits can be attained by learning the same language, or by learning two different languages (2 credits each).
Research-Related Courses	—		2 credits ・2 credits in research opportunity courses	8 credits ・2 credits in research opportunity courses ・6 credits in independent research project for a bachelor's degree

Other major courses	— 30	Determined for each standard curriculum	Determined for each standard curriculum
Total	~~31~~ credits above * The upper limit for the required courses and restricted elective courses in humanities and social science courses described above is 5 credits, the upper limit for required English language courses is 4 credits, and the upper limit for required basic science and technology courses is 14 credits.	110 credits or more that satisfy the above requirements	124 credits or more that satisfy the above requirements

Note: Credits attained from the Japanese language and culture courses, teacher education courses, and some global awareness and other breadth courses do not count toward the minimum of 31 credits required to be eligible for department affiliation. (Credits from the wellness courses can be counted as part of the required credits.)
Credits attained from the teacher education courses do not count toward the minimum of 110 credits required to be eligible for the independent research project or the minimum of 124 credits for graduation eligibility. (Credits from the wellness courses, global awareness and other breadth courses, and Japanese language and culture courses can be counted as part of the required credits.)

Table 3. Overview of numbers of required credits prescribed by standard curricula for the Application for Independent Research Project for Bachelor's Degree and for graduation

The numbers of credits shown in this table exclude the numbers of credits for the humanities and social science courses, English language courses, second foreign language courses, and basic science and technology courses shown in Table 2. Details can be found in each Standard Curriculum Guide so please be certain to refer to the Standard Curriculum Guide for the undergraduate major concerned.

Standard curriculum	Eligibility for Application for Independent Research Project for bachelor's degree (Research opportunity course is recorded as "Research Opportunity Project")	Eligibility for graduation (Research opportunity course is recorded as "Research Opportunity Project" and independent research project for the bachelor's degree is recorded as "Special Topic Research")
Undergraduate Major in Mathematics	32 (◎ 12, ○ 18, Research Opportunity Project 2) (When a department transfer occurs when the Application for Independent Research Project for bachelor's degree is submitted, this will be prescribed separately.)	38 (◎ 12, ○ 18, Research Opportunity Project 2, Special Topic Research 6) (When a department transfer occurs when the Application for Independent Research Project for bachelor's degree is submitted, this will be prescribed separately.)
Undergraduate Major in Physics	45 (◎ 24 (including for 4 Experiments in Physics A, B and 2 for Research Opportunity Project))	63 (◎ 33 (including 2 for Research Opportunity Project and 6 for Special Topic Research), ○ 4)
Undergraduate Major in Chemistry	◎ 14 (lectures), ◎ 12 (experiment), 2 Research Opportunity Project, 15 unlabeled	◎ 18 (lecture), ◎ 12 (experiment), 2 Research Opportunity Project, 6 Special Topic Research, 20 unlabeled
Undergraduate Major in Earth and Planetary Sciences	◎ 1, 3 from prescribed experiment courses, 2 Research Opportunity Project	◎ 1, ○ 25 (including 3 from prescribed experiment courses), 2 Research Opportunity Project, 6 Special Topic Research
Undergraduate Major in Mechanical Engineering	50 (◎ 18 (including 2 Research Opportunity Project), ○ 14)	55 (◎ 24 (including 2 Research Opportunity Project, 6 Special Topic Research), ○ 14)
Undergraduate Major in Systems and Control Engineering	54 (◎ 6 (including 2 Research Opportunity Project), ○ 11)	60 (◎ 12 (including 2 Research Opportunity Project, 6 Special Topic Research) , ○ 11)
Undergraduate Major in Electrical and Electronic Engineering	53 (including 27 ◎ (Research Opportunity Project 2))	65 (◎ 38 (including 2 Research Opportunity Project, 6 Special Topic Research))
Undergraduate Major in Information and Communications Engineering	50 (◎ 10, ○ 17 (9 A group, 8 B group), including 2 Research Opportunity Project)	60 (including ◎, 17 ○ (9 A group, 8 B group), 2 Research Opportunity Project, 6 Special Topic Research)
Undergraduate major in Industrial Engineering and Economics	46 (2 Research Opportunity Project, ○ 30 (excluding independent project courses))	70 (2 Research Opportunity Project, 6 Special Topic Research, 30 ○ (excluding independent project courses))

Undergraduate Major in Materials Science and Engineering	12 ◎, 2 Research Opportunity Project, 6 Materials Science Laboratory (M, P, C), 6 ○	40 (12 ◎, 2 Research Opportunity Project, 6 Special Topic Research, 6 Materials Science Laboratory (M, P, C), 6 ○), 20 including 6 prescribed 300-level courses from the same course group
Undergraduate Major in Chemical Science and Engineering	46 (21 ◎ (including 2 Research Opportunity Project), 4 ○ (same core course group))	56 (27 ◎ (including 2 Research Opportunity Project, 6 Special Topic Research), 4 ○ (same core course group))
Undergraduate Major in Mathematical and Computing Science	50 (5 A group, 5 B group, 8 C group), 2 Research Opportunity Project, 2 Basic Science and Technology Courses (mathematics), 2 (computing and information science)	50 (5 A group, 5 B group, 8 C group), 2 Research Opportunity Project, 6 Special Topic Research
Undergraduate Major in Computer Science	10 A group, 10 B group, 10 C group, 2 Research Opportunity Project, 2 Basic Science and Technology Courses (computing and information science)	10 A group, 10 B group, 10 C group, 2 Research Opportunity Project, 6 Special Topic Research
Undergraduate Major in Life Science and Technology	58 (12 ◎, 8 ○, 2 Research Opportunity Project)	64 (12 ◎, 8 ○, 2 Research Opportunity Project, 6 Special Topic Research)
Undergraduate Major in Architecture and Building Engineering	50 (6 ◎, 18 ○, 2 Research Opportunity Project), 5 Basic Science and Technology Courses (descriptive geometry)	59 (9 ◎, 21 ○, 2 Research Opportunity Project, 6 Special Topic Research)
Undergraduate Major in Civil and Environmental Engineering	46 (9 ◎ (including 2 Research Opportunity Project), 14 ○)	60 (19 ◎ (including 2 Research Opportunity Project, 6 Special Topic Research), 21 ○)
Undergraduate Major in Transdisciplinary Science and Engineering	44 (28 ◎, 2 Research Opportunity Project)	50 (~~31~~ ◎, 2 Research Opportunity Project, 6 Special Topic Research)

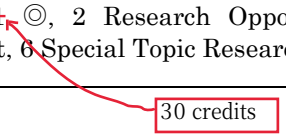


Table 4. Preferable numbers of required course credits to be earned by semester or quarter

This table presents numbers of required courses and restricted elective courses by semester and quarter to serve as a reference in setting up study plans.

The minimum numbers of credits required that are supposed to be earned by the time of graduation are as shown in Table 2 and Table 3, so please base your semester and quarter study plans on these tables.

	1st year				2nd Year				3rd year				4th year				Total
	Spring		Fall		Spring		Fall		Spring		Fall		Spring		Fall		
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	
Humanities and Social Science Courses	2 (*1)	3 (*2)			4				2		2 (*3)		—				13
English Language Courses	1	1	1	1	1	1	1	1	1 (*4)	—			—				9
Second Foreign Language Courses	—				1	1	2 (*5)				—		—				4
Basic Science and Technology Courses	14 or more				—				—				—				14
Research Opportunity Course	—				—				2 (*6)				—				2
Bachelor's degree independent research	—				—				—				6		—		6

(*1) Tokyo Tech Visionary Project

(*2) 1 credit each from Humanities, Social Studies, and Transdisciplinary Studies

(*3) Liberal Arts Final Report

(*4) English 9

(*5) Take in fall semester of second year or spring semester of third year

(*6) Take in 1Q, 3Q, or 4Q (Students who want to apply for early graduation have to take in 1Q.)

Note: In the undergraduate major in Mathematical and Computing Science, the undergraduate major in Computer Science, and the undergraduate major in Architecture and Building Engineering, there are separate requirements for basic science and technology credits that must be earned in order to submit an Application for Independent Research Project for Bachelor's Degree. Please check the standard curriculum for the undergraduate major concerned regarding applicable courses.

(3) Earning credits

Courses and credits

Every course taken will have its own specified number of credits, and the composition and meaning of those credits are as follows.

Take the example of 2-1-0 credits. This number means that the course is configured to provide 2 lecture credits, 1 exercise credit, and 0 (zero) experimentation/laboratory/etc. credit. The total of 3 lecture, exercise, and experimentation/etc. credits for this course is the number of credits for the course.

A course for 1 credit comprises content that requires 45 hours of coursework, including study outside of class hours. As a rule, that time is calculated following the below criteria in accordance with the particular course and taking into

consideration the preparation, review, and other such work outside of class that is necessary.

(1) For lecture and exercise courses, 15 hours of class work is taken as 1 credit.

(2) For experimental/laboratory work, practical exercises, drawing, and practical skill training, 30 hours of class work is taken as 1 credit.

* There are some courses that, in the case of criterion (1) above, take 30 hours of class work as 1 credit, and in the case of (2) above, take 45 hours of class work as 1 credit.

Upper limit on number of credits in application for registration (maximum credit load system)

One credit is granted for 45 hours of coursework, including study outside of class hours (Standards for the Establishment of Universities). In other words, students are required to work on learning before and after classes, apart from the time spent learning while attending classes. Courses are held on the assumption that learning will take place outside of class hours, as students study independently before their classes, engage in discussion or other activity regarding the content of what they have learned in class, have problems assigned for work after class, etc. This is why an upper limit is placed on the number of credits in courses that you apply to register for in an academic year (April to March). That limit is 48 credits. This is to assure that you have the time needed to gain a solid grasp of the course content through study outside of class hours. (This is called the maximum credit load, or cap system.)

However, if you have a GPA of 3.00 or higher for the academic year in question, your maximum credit load in the next academic year will be 56 credits. In the case of newly admitted students and students whose GPA was lower than 3.00 in the previous academic year, if their GPA for the spring semester of the current academic year is 3.00 or higher, then the upper limit on their number of credits for that academic year (April to March) will be 52 credits, which includes the credits for the courses they applied to register for in the spring semester of that same year. Credits for courses that do not meet graduation requirements (such as teacher education courses) are not counted toward the upper limit on number of credits.

Note: Students are not permitted to register for more than the stated maximum credit limit. Regardless of whether students succeed or fail to attain credits, the maximum number they can register for is 48, 56, or 52 as described above.

Courses with limits on enrollment

From the second year on, there may be some experimental/laboratory work, practical exercise, drawing, exercise, or other such courses that limit the number of students who can enroll because of limited facilities or other such circumstances. Even if you want to take such a course and you apply to register, in some cases you may not be admitted. There are also courses such as those in humanities and social science courses that are open to all students but that may also limit the number of enrolled students if the number will exceed the capacity of the lecture hall or for other such reason.

Courses with prerequisites for registration

There are some courses that are placed in a predetermined relationship and that are supposed to be taken in sequence, so that you cannot register for certain of those courses (courses with prerequisites for registration) until after you have earned credits in their prerequisite courses. Even if you have not earned credit in the prerequisite course, you will be able to register for a course with prerequisites if you obtain the permission of the instructor of the course with prerequisites. However, if you do not earn the credits in the prerequisite courses while an enrolled

student, the credits for those courses with prerequisites for registration cannot be counted toward the number of credits required for graduation. Courses with prerequisites for registration are listed in the appended tables of the standard curriculum for each undergraduate major.

Application for registration

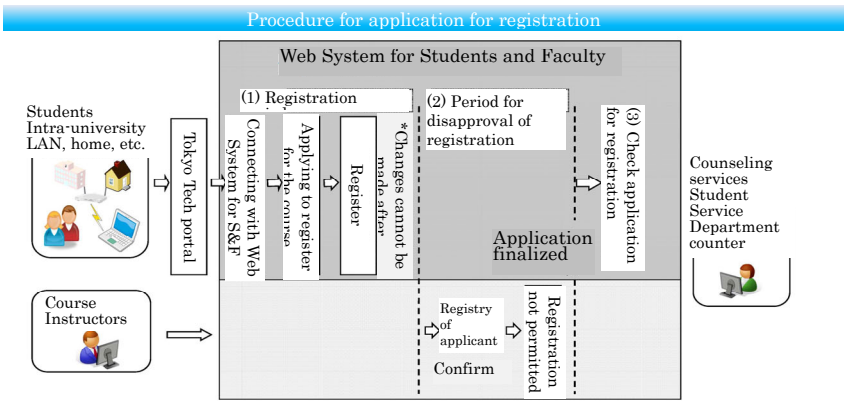
In order to earn course credits, you must obtain permission by applying to register for the course (submit an application for registration) within the determined period of time using the Web System for Students and Faculty.

Note: Unless you obtain permission by applying to register for the course, you will not be able to take the course, take exams, or earn credits for it.

1) Timing and procedure of application for registration

At the start of every semester, periods in which to apply for registration are set up for students by their year of admission. During that period, you must log in to the Tokyo Tech portal and use the Web System for Students and Faculty to register your application for registration.

Put into diagram form, the procedure for application for registration will look like the figure on the right.



Period for application for registration: From the start of the spring semester or the start of the fall semester (the start of the first quarter or third quarter) to the day that is the day of the week on which all the courses listed in the schedule of courses for that quarter have met two times. (The specific date will be shown in course timetables.)

Period for disapproval of registration: If your application for any course is disapproved by the instructor of the course, you will be notified by e-mail by the day that is the day of the week on which all the courses listed in the schedule of courses for that quarter have met three times. (The specific date will be shown in course timetables.) In that case, your application for registration for that course will be withdrawn.

Check application for registration: You will be notified by email from the Web System for Students and Faculty after completing the course registration process. Make sure that information regarding your courses and groups is correctly registered on the System. (Information on course(s) for which registration is disapproved (see the preceding item) will be deleted from the list of your courses.) There will be different deadlines set for course registration, cancelation, and addition procedures. Please complete necessary procedures by each deadline.

Note

(1) In the event that illness or some other unavoidable reason prevents you from following these procedures within the prescribed time, you must make certain to inform the Ookayama Student Division or the Suzukakedai Student Division before the deadline and follow their instructions.

(2) You may not apply to register for a course you have already passed. In order to register for a course that you failed, an Application for Registration (Reapplication) will be required.

(3) You may not apply to register for courses with class hours that partially or completely overlap.

2) Application for added course

In order to register for course(s) after the registration period has ended, you must take the "course addition" procedure on the Web System and obtain approval of the relevant course instructor(s). This must be done by the fifth scheduled class for every course offered in that quarter. (The exact date can be found on course timetables.)

3) Withdrawal of application

When you have submitted an application for registration for a course but then intend to withdraw it after the period for application for registration has ended, you must follow the procedure for withdrawal of application on the Web System for Students and Faculty by the day that is the day of the week on which all the courses listed in the schedule of courses for that quarter have met three times. (The specific date will be shown in course timetables.) No withdrawal will be possible after that date. In the event that illness or some other unavoidable reason prevents you from following these procedures within the prescribed time, you must make certain to inform the Ookayama Student Division or the Suzukakedai Student Division before the deadline and follow their instructions.

4) Application for added intensive lecture course and withdrawal of application

For intensive courses, the course addition and cancellation deadlines are the final class day of the course, irrespective of the deadlines stated in 2) and 3) above. To cancel registration, you must submit a cancellation request form to the Student Division by 17:30 on the final class day. If classes are scheduled for the 9th period, or if the final day falls on a Saturday, Sunday, or holiday, please submit the form on the next following weekday.

Exams and grades

1) Coursework certification and evaluation of learning

When you have submitted an application for registration for a course and pursued studies in it, your work for it will be evaluated by final exams or other such methods in accordance with the purpose of the course, its format, and its content. The evaluation will be comprehensive and will determine whether you pass or fail. Evaluation is conducted on the basis of a perfect score of 100 points, with 60 points or more counting as a passing grade for which credit will be granted. Once you have passed a course, you cannot cancel the credits from it and you cannot update the grades from it. Some courses are not graded with point scores but are instead evaluated as pass or fail.

2) Makeup exams and reexamination

The exams held for students who are unable to take final exams due to illness, accident, or other such unavoidable reason are called makeup exams. The exam held in the same term for students who failed an exam is called a

reexamination. The grade given to students who pass a reexamination will be 60 points in every case.

When a makeup exam or reexamination is to be held, it will be announced on a case-by-case basis by posted announcements, etc.

3) Grades and award of credit

Your grades for a course you took can be checked on the Web System for Students and Faculty after the end of each quarter when the processing of grade reports has been completed. However, credit is awarded each semester (spring semester and fall semester), not each quarter.

4) Confirming grades and filing complaints

When you have a question about your grade, you can confirm the grade directly with the instructor or through the Ookayama Student Division or the Suzukakedai Student Division. It is also possible to file a complaint regarding the result of confirmation. Requests to confirm grades will be received up to 10 days after grades have been announced or, when the grades are involved in determination of graduation or completion, up to three days. Complaints can be filed within three days after receiving confirmation results. For details, please refer to the Guide to Confirmation of Grades and Filing of Complaints at the Tokyo Institute of Technology (p. 217).

Requests can only be made to confirm grades or file complaints when there is a clear basis for doubting your grade. Requests made when you simply want your grade to be reevaluated and you do not show a specific substantial basis, or when you are seeking relief and your request is basically a petition in nature, will not be accepted. Specific examples are given below.

1. Example of acceptable request
   1) A grade that is misrecorded or otherwise clearly appears to be an error by the instructor of the course
   2) A grade that clearly appears to be in error in light of the standards or methods for grading stated in the syllabus
2. Example of unacceptable request
   1) A plea of need or extenuating circumstances addressed to the instructor (It affects graduation (i.e., if I receive this credit I can graduate), etc.)
   2) Appeal based on dissatisfaction by comparison with another student (My friend got 80 points, so why did I only get 70, etc.)
   3) Request without specific basis that inquires only about the reason for the evaluation received (I tried really hard, so why did I only get 60 points, etc.)

* Even requests under 2) and 3) can be accepted if clear grounds are given.

(4) Guidance on learning

Students in the circumstances described below are considered underachieving students and are subject to guidance on learning (individual interviews, etc.) from academic advisors, etc. For details, please refer to Arrangement of Guidance on Learning for Underachieving Students in the Tokyo Institute of Technology Bachelor's Degree Program (p. 223). This will not apply in the case of a leave of absence or other such circumstance.

- Students who did not register for any courses in the preceding semester
- Students who are not affiliated with a department and to whom any of the following apply

1) Students who earned fewer than 15 credits in the semester in question

2) Students with a GPA of lower than 1.25 for the semester, and the number of courses from which they earned credits during the semester in question is less than 60% of the number of courses for which they submitted applications for registration during the semester in question

3) Students who have spent one year enrolled as a current student but have not become affiliated with a department

・Students who are affiliated with a department but who have not qualified to apply for the independent research project for a bachelor's degree and to whom any of the following apply

1) Students who have had two or more consecutive semesters in which they earned fewer than 15 credits

2) Students with a GPA of lower than 1.25 for the semester, and the number of courses from which they earned credits during the semester in question is less than 60% of the number of courses for which they submitted applications for registration during the semester in question

3) Students who became affiliated with a department after which they spent two years enrolled as current students but who have not qualified to apply for the independent research project for a bachelor's degree

・Students who have spent one year enrolled as a current student after starting an independent research project for a bachelor's degree but who have not graduated

(5) GPA and GPT

GPA (Grade Point Average)

In 2016, Tokyo Tech introduced the Grade Point Average ("GPA") system to objectively indicate and evaluate students' academic performance. The GPA system, which is a stringent and transparent system, fosters proactive learning in students and enhances the quality of supervision by faculty, both of which improve the overall quality of learning at the Institute. The GPA is recorded in academic transcripts and in academic records. It is also used as a criterion for aggregating the upper limit on the number of credits in course registration, and as a benchmark for students subject to learning guidance. The Web System for Students and Faculty provides, in addition to the GPA score per quarter, GPA scores per semester, per year, and the overall score throughout the enrolled period.

Courses that do not count toward graduation requirements (teacher education courses and graduate courses), research-related courses (research opportunity courses, independent research projects for a bachelor's degree, and advanced independent research projects for a bachelor's degree), and courses that are graded on a pass/fail basis do not count toward the GPA. When students complete courses using credits earned at other universities, those courses are also excluded from GPA calculations.

Additionally, when a student passes a course that he or she previously failed, the GPA is modified accordingly (i.e., the old score is replaced with the newly attained score).

The following equations are used to calculate scores. Decimals are rounded off at the third decimal place. Course grades less than 60 are counted as 0 (GP = 0).

$$\mathrm{GP} = \frac{(\text{Course grade} - 55)}{10}$$

$$\text{Cumulative GPA} = \frac{\text{Sum of all (GP of registered course while enrolled} \times \text{number of credits the course awards)}}{\text{Total number of credits attained while enrolled}}$$

$$\text{Yearly GPA} = \frac{\text{Sum of all (GP of course registered in an academic year} \times \text{number of credits the course awards)}}{\text{Total number of credits attained in an academic year}}$$

$$\text{Semester GPA} = \frac{\text{Sum of all (GP of course registered in a semester} \times \text{number of credits the course awards)}}{\text{Total number of credits attained in a semester}}$$

$$\text{Quarter GPA} = \frac{\text{Sum of all (GP of course registered in a quarter} \times \text{number of credits the course awards)}}{\text{Total number of credits attained in a quarter}}$$

GPT (grade point total)

The GPT is an indicator that is used as a criterion for early graduation and early admission. Courses that do not count toward graduation requirements (such as teacher education courses) and courses with credits recognized by special arrangement do not count toward the GPT. Research-related courses and courses graded on a pass/fail basis do count toward the GPT, with a pass counted as GP=2.5 and a fail counted as GP=0. The GPT is shown on the Web System for Students and Faculty.

The formulas used to calculate the GPT are as follows.

If the result is not a whole number, it will be rounded off to the second decimal place.

A grade of 59 points or less for a course will be shown as GP=0.

$$\text{GP} = \frac{(\text{Evaluation in each course taken} - 55)}{10}$$

$$\text{GPT} = \frac{\text{Total of (number of credits} \times \text{grade points in courses applied for and taken while enrolled at Tokyo Tech)}}{110}$$

(6) Web System for Students and Faculty, OCW, OCW-i, and T2SCHOLA

The Web System for Students and Faculty is used for applications for registration, viewing grades, department affiliation procedures (preparatory inquiries, main application), information about cancelled classes, address change procedures, etc.

OCW stands for Tokyo Tech Open CourseWare, which operates a website to provide course syllabi, lecture notes, and other such material for access inside and outside the university. Please use this material for your reference when applying to register for courses and when studying.

OCW-i and T2SCHOLA are for exclusive use by students who have submitted applications for registration in particular courses. They can check the timetables, see information on cancelled classes, receive individual problems from faculty members, etc.

You can log in from the Tokyo Tech portal website (http://portal.titech.ac.jp/) to use the Web System for Students and Faculty, OCW-i, and T2SCHOLA. The T2SCHOLA mobile app can be installed on iOS and Android devices.

(7) Academic advisors

From the time of admission, students at Tokyo Tech will have two academic advisors each who consult with and give advice to them about their studies and options for advancing and provide other such finely tailored learning

support while taking into consideration the student's course registration status, grades, etc. New academic advisors may take over when students become affiliated with a department, when they start an independent research project for a bachelor's degree, or at other such junctures.

(8) Student Life Coaches

Student Life Coaches explain what study is for university students, the meaning of the Tokyo Tech educational system in terms of learning, and the significance of Tokyo Tech's distinctive educational system, and also provide information about arrangements for learning. They offer guidance and seminars, provide one-on-one sessions, and help new students adjust to learning at Tokyo Tech. Please consult them for any concerns or questions you may have at the start of university life.

(9) Learning portfolio system

This is a system that collects and records material for the learning process and results. You use it to scrutinize yourself, etc. Your academic advisors check the portfolio, enter comments, etc., and also use it for interviews. Use the learning portfolio system by logging in from the Tokyo Tech portal website.

The portfolio (1) is useful for recording your own learning and related activities to use for scrutinizing yourself and for deciding your objectives and your next steps, and (2) can also be put to effective use in your university life and in your own future and career. Mainly it serves in visualizing your university experience and helps sustain you in the future. The portfolio can help you gain an objective view of yourself, and we urge you to put it to good use for your independent study.

(10) Sending academic work and grade reports and notifications to the personal guarantor

At Tokyo Tech, your academic work and grade report is sent to your personal guarantor once a year (for students who are not affiliated with a department, this is done in October every year; for students who are affiliated with a department, it is done in June every year). The personal guarantor may also be notified of changes in your status, such as Study Abroad or leave of absence. For details, please refer to Handling of Personal Guarantor and Related Matters at the Tokyo Institute of Technology (p. 219).

(11) Taking courses at other universities

Credit transfers with Ochanomizu University, Keio University, and Tokyo University of Foreign Studies

Agreements have been concluded for the transfer of credits between Tokyo Tech and Ochanomizu University, between Tokyo Tech and Keio University, and between Tokyo Tech and Tokyo University of Foreign Studies. Students who wish to (this applies to students affiliated with a department, except in the case of Tokyo University of Foreign Studies) can therefore take certain courses as special auditing students at Ochanomizu University, Keio University, and Tokyo University of Foreign Studies and receive credits.

Credit transfer, etc. through the Confederation of the Four Universities (Tokyo Medical and Dental University, Hitotsubashi University, and Tokyo University of Foreign Studies)

Tokyo Tech concluded the Confederation of the Four Universities Charter with Tokyo Medical and Dental University, Hitotsubashi University, and Tokyo University of Foreign Studies. Students who are affiliated with the

Confederation of the Four Universities Multidisciplinary Program (see p. 24) can take designated courses and earn credits under this program. Some courses may also be open even to students who are not affiliated with the Multidisciplinary Program.

* Up to 60 credits earned at other universities can be counted toward the number of credits required for graduation.

Note: The 60 credits also includes credits earned at other universities before admission to Tokyo Tech and credits earned at other universities after admission (including universities at Study Abroad destinations).

* For methods of registration, courses that can be registered for, etc., please check posted announcements, websites, etc.

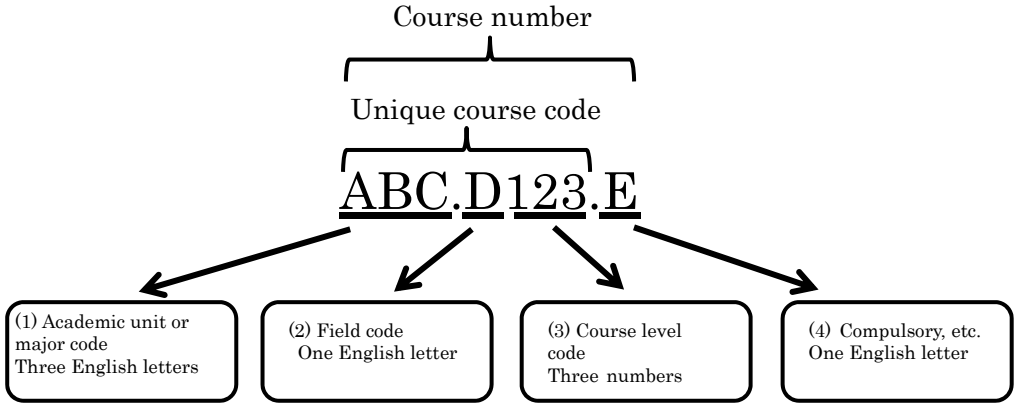
2. Course Numbering System

1. What are course numbers?

Course numbers are numbers that indicate the fields of study and levels of the courses. All courses are assigned course numbers, which allow students to create a systematic study plan.

2. Course number overview

Course numbers are composed of four distinct codes. Codes (1) to (3) of the course number below make up the unique course code.



(1) Academic unit or major code

This code indicates the department, undergraduate (or graduate) major, or course category of the liberal arts and basic science courses. See Tables 5 and 6 below.

(2) Field code

This code indicates the field within the academic unit or major. Information regarding field codes that are specified by departments and undergraduate majors is available in the standard curriculum of each department.

(3) Course level code

Course levels at Tokyo Tech are indicated by three digit numbers.

Courses whose last two digits range from 01 to 29 are basic courses and those whose last two digits are 30 and above are advanced and developmental courses. However, larger numbers do not necessarily mean higher level courses.

Course level	Competencies that will be developed	Target
100-level Introductory and Basic courses	◎Acquire knowledge and develop the mindset that is essential to study at Tokyo Tech regardless of the student's School.	Bachelor's Degree Program
200-level Foundation courses	◎Acquire basic knowledge, receive education, and develop linguistic skills that are generally required at the student's affiliated School and department. ◎Develop the creativity and imagination based on the student's field of expertise. ◎(+) Understand the relationship between required courses and acquire specialized knowledge using the English language.	
300-level Advanced courses	◎Acquire knowledge, receive education, and develop linguistic and expressive skills that are required at the student's School or department. ◎Acquire knowledge related to the student's field of expertise and in other fields of study.	

	◎(+) In addition to the major, acquire basic knowledge of a minor field in a systematic manner.	
400-level Advanced courses	◎Acquire a deep understanding and knowledge of the major field in English. ◎Receive education essential for graduate students.	Master's Degree Program, Professional Degree Program
500-level Independent courses	◎Acquire a deep understanding and knowledge of fields related to the major as well as in other fields of study in English. ◎(+) In addition to the major, acquire specialized knowledge of a minor field in a systematic manner.	
600-level Expert courses	◎Carry out research on advanced topics in specialized fields and present findings in an international stage. ◎Acquire skills to form research questions.	Doctoral Degree Program

(4) Compulsory, etc.

This code indicates whether a course is a required, restricted elective, or elective course for the specified department or graduate major.

Code	Meaning
R	Required course
A–K	Restricted elective course
L	Elective course

3. Recommended course numbers

Course numbers offer information regarding the academic unit or major of the respective Schools and departments. In addition, they indicate recommended courses to students who are affiliated with other Schools and departments. Recommended course numbers use the same course number structure as course numbers.

For instance, if Department A's XXX Course, whose course number is AAA.X111.R, is also a recommended course for students in Department B, the recommended course number might be BBB.Y125.E.

Note: Recommended course numbers are always shown together with the unique course code in the following way.

Recommended course number (Unique course code)

In the case of the above example, the recommended course number would be BBB.Y125.E (AAA.X111).

Table 5. Academic unit or major code (Core Courses)

School	Undergraduate major, etc.	Academic unit or major code
School of Science	Undergraduate Major in Mathematics	MTH
	Undergraduate Major in Physics	PHY
	Undergraduate Major in Chemistry	CHM
	Undergraduate Major in Earth	EPS

Table 6. Academic unit or major code (Liberal Arts and Basic Science Courses)

Course category	Academic unit or major code	Course subcategory	Field code
Humanities and Social Science Courses	LAH	——	
English Language Courses	LAE	——	
Second Foreign Language Courses	LAL	——	
Japanese Language and Culture Courses	LAJ	——	

	and Planetary Sciences						
School of Engineering	Undergraduate Major in Mechanical Engineering	MEC		Teacher Education courses	LAT	——	
	Undergraduate Major in Systems and Control Engineering	SCE		Breadth Courses	LAW	Wellness Courses	W
	Undergraduate Major in Electrical and Electronic Engineering	EEE				Global Awareness and other Breadth Courses	X
	Undergraduate Major in Information and Communications Engineering	ICT		Basic Science and Technology Courses	LAS	Mathematics Courses	M
	Undergraduate Major in Industrial Engineering and Economics	IEE				Physics Courses	P
School of Materials and Chemical Technology	Undergraduate Major in Materials Science and Engineering	MAT				Chemistry Courses	C
	Undergraduate Major in Chemical Science and Engineering	CAP				Life Sciences Courses	B
School of Computing	Undergraduate Major in Mathematical and Computing Science	MCS				Earth and Space Sciences Courses	A
	Undergraduate Major in Computer Science	CSC				Descriptive Geometry Courses	D
School of Life Science and Technology	Undergraduate Major in Life Science and Technology	LST				Computing and Information Science Courses	I
School of Environ-ment and Society	Undergraduate Major in Architecture and Building Engineering	ARC				Environmental Education Courses	E
	Undergraduate Major in Civil and Environmental Engineering	CVE				Frontiers of Science and Technology Courses	F

	Undergraduate Major in Transdisciplinary Science and Engineering	TSE
	Undergraduate Major in Social and Human Sciences	SHS
First-Year Courses, Creative Process Courses	School of Science	XIP
	School of Engineering	XEG
	School of Materials and Chemical Technology	XMC
	School of Computing	XCO
	School of Life Science and Technology	XLS
	School of Environment and Society	XES
Common Courses		XCO*

		Creativity Development Courses	R

* Some common courses use different codes.

3. Joining departments and bachelor's degree programs

1. Affiliation with departments and possible numbers of students accepted to departments

When advancing to the second year of studies, undergraduate students will join a department that offers their chosen major. To be admitted to a department, students must have spent at least a year at Tokyo Tech, completed designated courses, and fulfilled the credit requirements as per Table 8.

Each department has a maximum number of students to be admitted, which will be adjusted every year based on the number of students who have satisfied the stated requirements and the number of vacancies in each School. (Vacancies will be calculated by subtracting the number of students already enrolled from the enrollment capacity of each School.) Table 7 shows possible numbers of students accepted to departments per year.

The departments that students will join is determined based on academic grades in 100-level courses students take in the first year as well as their choice of undergraduate major. As such, please keep in mind the importance of first-year studies in beginning your undergraduate major studies.

Not all students will be able to join their department of choice, however, if the number of applicants exceeds the number of available places. Depending on their grades, students may have to join a department lower on their list of preferences.

Table 7. Possible number of students accepted to departments per year

School	Department	Possible number of students accepted per year
School of Science	Department of Mathematics	29
	Department of Physics	61
	Department of Chemistry	44
	Department of Earth and Planetary Sciences	32
School of Engineering	Department of Mechanical Engineering	144
	Department of Systems and Control Engineering	48
	Department of Electrical and Electronic Engineering	90
	Department of Information and Communications Engineering	49
	Department of Industrial Engineering and Economics	62
School of Materials and Chemical Technology	Department of Materials Science and Engineering	92
	Department of Chemical Science and Engineering	109
School of Computing	Department of Mathematical and Computing Science	37
	Department of Computer Science	64
School of Life Science and Technology	Department of Life Science and Technology	164
School of Environment and Society	Department of Architecture and Building Engineering	62
	Department of Civil and Environmental Engineering	40
	Department of Transdisciplinary Science and Engineering	45

Note: The numbers stated above will be used for pro rata allocation when calculating the actual number to be accepted to each department.

How students' departments are decided

(1) Students submit preferences for departments to join

To learn about procedures for joining a department, please attend orientation and information sessions held by Schools and/or departments around late September to November every year (exact dates will be announced separately). Students will later be asked to list intended departments in order of preference, which should cover all the departments belonging to their School. In principle, they are not permitted to choose departments outside of their School.

(2) Students fulfil the credit requirements

Students must have fulfilled the credit requirements (see Table 8) by the end of 4Q in their first year, in order to join a department upon advancing to their second year.

Table 8. Credit requirements to enter a department

<table>
<tr><td colspan="2">Course category, etc.</td><td colspan="2">Credit requirements for department affiliation
(Both conditions below must be met.)</td></tr>
<tr><td>Humanities and Social Science Courses</td><td>A total of 5 credits by completing 4 courses
・2 credits in "Tokyo Tech Visionary Project" among 100-level required courses
・3 credits in 100-level restricted elective courses (1 credit each from the humanities, social sciences, and transdisciplinary studies)</td><td rowspan="3">A total of 17 credits or more from the total of 23 credits available in the 20 courses shown in the left-hand columns</td><td rowspan="4">A total of 31 credits or more from the courses shown in the left-hand columns</td></tr>
<tr><td>English Language Courses</td><td>A total of 4 credits by completing 4 required 100-level courses</td></tr>
<tr><td>Basic Science and Technology Courses</td><td>A total of 14 credits by completing 12 required 100-level courses</td></tr>
<tr><td colspan="2">100-level courses other than those listed above
However, the following courses are excluded:
● Among Global Awareness and other Breadth Courses (Breadth Courses),
- Overseas Training for Global Scientists and Engineers Basic 1A to 4D, 1A', 1B'
- Introduction to Society and Technology
- Study Abroad Program for International Communication in Asia – Basic Course (Tokyo Tech-AYSEAS)
- Remote Learning Program for International Communication in Asia – Basic Course (Tokyo Tech-AYSEAS)
● Among English Language Courses,
- Study Abroad Program in English 1A and 2B</td><td>—</td></tr>
</table>

- Scientific Technical English Study Abroad Practicum I • Among Second Foreign Language Courses, - Study Abroad Program in Second Foreign Languages 1A and 1B • Teacher Education Courses • Japanese and Culture Courses		

(3) Decisions on students' departments made

Students' affiliations will be decided based on the following:

i. The maximum number of students accepted to departments

Each department determines the maximum number of second-year students to be accepted. It is calculated by multiplying the total number of students in the School who have fulfilled requirements for department affiliation by 1.1, then dividing the result in proportion to the numbers specified for each department in the same School (see Table 7) on a pro rata basis (rounded down). In addition, various matters concerning learning and teaching at each School and department will be taken into consideration in setting the maximum number.

ii. The number of students accepted to departments from within the same School

The number of second-year students to be accepted from within the same School is calculated by multiplying the result obtained in item i. by 100/110 (rounded up).

iii. The maximum number of students accepted to departments from other Schools

Each department can accept a limited number of second-year students from other Schools. The number is obtained by multiplying the result in item i. by 10/110 (rounded down).

iv. Students' grades and choice of major

Students who earned higher evaluation scores (see Table 9, I. Course credits, etc. considered for department affiliation, II. How to calculate evaluation scores for department affiliation) are given priority in deciding their affiliations.

Based on the above:

1. Affiliations of students who wish to enter a department that belongs to their current School are determined so that departments do not exceed the number they can accept from within the same School calculated in item ii.
2. Affiliations of students whose departments were not determined in the preceding process, and affiliations of students coming from other Schools, are determined so that departments do not exceed the maximum number they can accept from other Schools as calculated in item iii. When deciding students' affiliations, it must be ensured that departments do not exceed the maximum number of students they can accept (see item i.), and that the total number of enrollees in each School does not exceed its capacity. The number of second-year students accepted to each School cannot exceed the number of vacancies calculated by subtracting the number of students already enrolled from the enrollment capacity of the School.

First-year students who fail to attain all the credits required to enter a department must wait a year, during which they must attain the remaining credits and fulfil the requirements.

Note:

Students who have passed Admission Office entrance exams and enter the School of Environment and Society will join departments predetermined as follows, and do not need to take any procedures as long as they have completed

requirements for department affiliation.

- Admission Office entrance exam A (総合問題A): Department of Architecture and Building Engineering
- Admission Office entrance exam B (総合問題B): Department of Civil and Environmental Engineering
- Admission Office entrance exam C (総合問題C): Department of Transdisciplinary Science and Engineering

Choosing departments of other Schools

When advancing to the second year of studies, undergraduate students will join a department that belongs to their current School, in principle. If there are students wishing to enter a department outside of their School, the following points must be taken into consideration when deciding their affiliations.

i. Students are permitted to select only one department from among those outside of their School.
ii. Each School must ensure that the total number of students who go to other Schools to enter a department does not exceed the quota that is calculated by multiplying the number of students eligible for department affiliation by 10/100 (rounded down). If more students than the set quota wish to move to other Schools, students who score higher points are given priority.
iii. Each School must ensure that the number of students coming from other Schools to join a department does not exceed the quota determined in accordance with "(3) Decisions on students' departments made, item iii."

Regardless of the above, students will not be permitted to enter departments outside of their Schools in cases where their intended School does not accept or accepts only a limited number of students from other Schools.

In particular, the Department of Mathematical and Computing Science and the Department of Computer Science, both of which belong to the School of Computing, have only limited spots available for students coming from outside of the School in April 2022.

Students wishing to enter departments outside of their current Schools must consult chairs of first-year studies before submitting a list of preference for departments.

Changing departments

Changing departments may be possible based on the following conditions and when School deans approve the change.

- The student goes through the department affiliation procedure again.
- Both the student's intended department and the School to which the department belongs have available spots.
- Faculty councils of the Schools concerned review the academic performance and progress of the student and decide on the change of department.

In order to request department changes, students are required to obtain approval from department chairs, and submit a request to School deans by way of the Student Division by the designated deadline. Students considering a change of department must first consult their academic advisors and department chairs. Changing departments will not be permitted after a new semester starts.

Table 9

I. Course credits, etc. considered for department affiliation

A) Credits from required courses and restricted elective courses

	Course title		Number of credits
Humanities and Social Science Courses	Restricted elective course (humanities)	Philosophy A	1
	Restricted elective course (humanities)	Art A	1
	Restricted elective course (humanities)	Cultural Anthropology A	1
	Restricted elective course (humanities)	Literature A	1
	Restricted elective course (humanities)	History A	1
	Restricted elective course (humanities)	Religion A	1
	Restricted elective course (humanities)	Communication A	1
	Restricted elective course (humanities)	Special Lecture: Social and Cultural Diversity	1
	Restricted elective course (humanities)	Special Lecture: Language and Culture	1
	Restricted elective course (humanities)	Introduction to Foreign Languages 1	1
	Restricted elective course (humanities)	Introduction to Foreign Languages 2	1
	Restricted elective course (humanities)	Studies of Culture and Representation A	1
	Restricted elective course (humanities)	Human Studies A	1
	Restricted elective course (Social studies)	Law (Constitutional Law) A	1
	Restricted elective course (Social studies)	Law (Civil Law) A	1
	Restricted elective course (Social studies)	Political Science A	1
	Restricted elective course (Social studies)	International Relations A	1
	Restricted elective course (Social studies)	Psychology A	1
	Restricted elective course (Social studies)	Sociology A	1
	Restricted elective course (Social studies)	Special Lecture: Social Issues and Communication	1
	Restricted elective course (Social studies)	Economics A	1
	Restricted elective course (Social studies)	Special Lecture: History of Fashion	1
	Restricted elective course (Social studies)	Special Lecture: Southeast Asia	1
	Restricted elective course (Social studies)	Media Studies A	1
	Restricted elective course (Social studies)	Special Lecture: Introduction to Management	1
	Restricted elective course (Social studies)	Special Lecture: Disability Studies	1
	Restricted elective course (Transdisciplinary)	Statistics A	1
	Restricted elective course (Transdisciplinary)	History of Science A	1
	Restricted elective course (Transdisciplinary)	History of Technology A	1
	Restricted elective course (Transdisciplinary)	Science and Technology for Society A	1
	Restricted elective course (Transdisciplinary)	Ethics in Engineering A	1
	Restricted elective course (Transdisciplinary)	Philosophy of Science A	1

	Restricted elective course (Transdisciplinary)	Social Modeling A	1
	Restricted elective course (Transdisciplinary)	Decision Making A	1
	Restricted elective course (Transdisciplinary)	Linguistics A	1
	Restricted elective course (Transdisciplinary)	Learning Design	1
	Restricted elective course (Transdisciplinary)	Special Lecture: Technology and art	1
	Restricted elective course (Transdisciplinary)	Special Lecture: Thinking and learning through museums	1
	Restricted elective course (Transdisciplinary)	Special Lecture: Introduction to the Design of Future Society	1
English Language Courses	Required course	English 1	1
	Required course	English 2	1
	Required course	English 3	1
	Required course	English 4	1
Basic Science and Technology Courses	Required course	Calculus I / Recitation	2
	Required course	Linear Algebra I / Recitation	2
	Required course	Fundamentals of Mechanics 1	1
	Required course	Fundamentals of Mechanics 2	1
	Required course	Fundamentals of Electromagnetism 1	1
	Required course	Fundamentals of Electromagnetism 2	1
	Required course	Basic Inorganic Chemistry	1
	Required course	Basic Organic Chemistry	1
	Required course	Basic Quantum Chemistry	1
	Required course	Basic Chemical Thermodynamics	1
	Required course	Fundamental Life Science 1-1	1
	Required course	Fundamental Life Science 1-2	1

B) Credits from elective courses

	Course title	Number of credits
Humanities and Social Science Courses	Seminar on Humanities (Culture, Society and Humanity) Introduction 1	2
	Seminar on Humanities (Culture, Society and Humanity) Introduction 2	2
	Seminar on Humanities (Facilitating dialogue, collaboration, and bliss) Introduction 1	2
	Seminar on Humanities (Facilitating dialogue, collaboration, and bliss) Introduction 2	2
	Seminar on Humanities(Art workshop) Introduction 1	2
	Seminar on Humanities(Art workshop) Introduction 2	2

Humanities and Social Science Courses	Seminar on Humanities(Religion and Spirituality in Contemporary Society) Introduction 1	2
	Seminar on Humanities(Religion and Spirituality in Contemporary Society) Introduction 2	2
	Seminar on Humanities (Museum and History) Introduction 1	2
	Seminar on Humanities (Museum and History) Introduction 2	2
	Seminar on Social Studies (Japanese Law Study Seminar) Introduction 1	2
	Seminar on Social Studies (Japanese Law Study Seminar) Introduction 2	2
	Seminar on Social Studies(Sociology of media and governance) Introduction 1	2
	Seminar on Social Studies(Sociology of media and governance) Introduction 2	2
	Seminar on Social Studies(US-Japan Relations: Military Base Problem in Okinawa) Introduction 1	2
	Seminar on Social Studies(US-Japan Relations: Military Base Problem in Okinawa) Introduction 2	2
	Seminar on Social Studies (Psychology) Introduction 1	2
	Seminar on Social Studies (Psychology) Introduction 2	2
	Seminar on Social Studies (Politics and Society) Introduction 1	2
	Seminar on Social Studies (Politics and Society) Introduction 2	2
	Seminar on Transdisciplinary (Decision Making) Introduction 1	2
	Seminar on Transdisciplinary (Decision Making) Introduction 2	2
	Seminar on Transdisciplinary (Introduction to Quantitative Approach to Social Science) Introduction 1	2
	Seminar on Transdisciplinary (Introduction to Quantitative Approach to Social Science) Introduction 2	2
English Language Courses	Oral Expression in English 1	1
	Oral Expression in English 2	1
	Oral Expression in English 3	1
	Oral Expression in English 4	1
	English Presentation Seminar 1	1
	English Presentation Seminar 2	1
	English Presentation Seminar 3	1
	English Presentation Seminar 4	1
	TOEFL Seminar (Listening and Speaking) 1	1
	TOEFL Seminar (Listening and Speaking) 2	1
	TOEFL Seminar (Listening and Speaking) 3	1
	TOEFL Seminar (Listening and Speaking) 4	1
	TOEFL Seminar (Reading and Writing) 1	1
	TOEFL Seminar (Reading and Writing) 2	1
	TOEFL Seminar (Reading and Writing) 3	1

	TOEFL Seminar (Reading and Writing) 4	1
	TOEIC Seminar 1	1
	TOEIC Seminar 2	1
	TOEIC Seminar 3	1
	TOEIC Seminar 4	1
	Oral Expression in English GI	2
	Oral Expression in English GII	2
Breadth Courses	Health Science	1
	Wellness Exercise	1
	Advanced Wellness Exercise	1
	Laboratory of Health Science	1
	Introductory Course for Global Scientists and Engineers	2
Basic Science and Technology Courses	Calculus II	1
	Linear Algebra II	1
	Calculus Recitation II	1
	Linear Algebra Recitation II	1
	Exercises in Physics I	1
	Exercises in Physics II	1
	Experiments in Physics I	1
	Experiments in Physics II	1
	Chemistry Laboratory I	2
	Chemistry Laboratory II	2
	Fundamental Life Science 2-1	1
	Fundamental Life Science 2-2	1
	Fundamental Life Science Laboratory	1
	Earth and Space Sciences A	2
	Earth and Space Sciences B	2
	Earth and Space Sciences, Laboratory and Field Studies (Geophysics)	1
	Earth and Space Sciences, Laboratory and Field Studies (Earth Materials)	1
	Earth and Space Sciences, Laboratory and Field Studies (Astronomy)	1
	Descriptive Geometry & Computer Graphics 1	1
	Descriptive Geometry & Computer Graphics 2	1
	Descriptive Geometry for Space Design 1	2
	Descriptive Geometry for Space Design 2	2
	Descriptive Geometry and Drawing	1
	Information Literacy I	1
	Information Literacy II	1
	Computer Science I	1

	Computer Science II	1
	Environment and Safety	1
	Mono-Tsukuri (Craft and Design)	2
First-Year Courses	Processes for creation in science and technology【School of Science】	1
	Processes for creation in science and technology【School of Engineering】	1
	Processes for creation in science and technology【School of Materials and Chemical Technology】	1
	Processes for creation in science and technology【School of Computing】	1
	Processes for creation in science and technology【School of Life Science and Technology】	1
	Processes for creation in science and technology【School of Environment and Society】	1
	School of Science Literacy	1
	School of Science Basic Science	2
	Engineering Literacy I	1
	Engineering Literacy II	1
	Engineering Literacy Ⅲ	1
	Engineering Literacy Ⅳ	1
	Materials and Chemical Engineering Literacy	1
	Introduction of Materials and Chemical Engineering A	1
	Introduction of Materials and Chemical Engineering B	1
	Introduction of Materials and Chemical Engineering C	1
	Literacy of Computing	1
	Foundations of Computing 1	1
	Foundations of Computing 2	1
	Foundations of Computing 3	1
	Introduction to Bio-Frontier Research【School of Life Science and Technology】	1
	School of Life Science and Technology Literacy	2
	International Bio-Creative Design【School of Life Science and Technology】	1
	School of Environment and Society Academic Group Literacy	1
	School of Environment and Society Academic Group Basic Science 1	1
	School of Environment and Society Academic Group Basic Science 2	1
	School of Environment and Society Academic Group Basic Science 3	1

C) English proficiency test scores

English proficiency test scores are converted into points in the following way and are added to evaluation scores.

- EIKEN: Grade 1 = 100 points
- TOEFL iBT: 1 score = 1 point

  A score exceeding 100 is counted as 100 points.
- TOEFL ITP: (Test score − 500) / 2.5 + 60 = Points (rounded down)

  A calculation result exceeding 100 is counted as 100 points.

・ TOEIC (Listening & Reading Test or TOEIC IP): (Test score − 600) / 6.875 = Points (rounded down)
A calculation result exceeding 100 is counted as 100 points.

(1) Students can use only one of the tests listed above. By taking one English proficiency test, students are deemed to earn "one (1) course credit."

(2) For verification of test scores, students must submit either of the following:

- TOEFL iBT or TOEFL ITP score report
- TOEIC Listening & Reading Test Official Score Certificate
- TOEIC IP Official Score Report
- EIKEN Grade 1 certificate

Note: TOEFL and TOEIC test scores are accepted only if the test date is within 2 years of January 31 in the year students submit the scores.

II. How to calculate evaluation scores for department affiliation

Course credits are converted into points and added to evaluation scores.

(1) From the required and restricted elective courses listed in A), choose the top 17 course credits that earned more points granted in a course. Multiply the number of each credit by the points, then add the results together. The sum of the points will be added to the evaluation score.

(2) Choose the top 14 course credits that earned more points from among the elective courses listed in B), the rest of the required/restricted elective courses in A), and the English Proficiency test (see I, C) above). Multiply the number of each credit by the points, then add the results together. The sum of the points will be added to evaluation scores.

The total points obtained in (1) and (2) is the evaluation score. The maximum evaluation score students can receive is 3,100.

Important points to note:

1. Points granted in a course range from 0 to 100. Courses that students fail to complete are also considered in calculating evaluation scores.
2. Among the top 17 credits from required and restricted elective courses, students can include up to 3 credits attained from humanities and social science courses.
3. If the last of the top 17 credits in required/restricted elective courses was earned from a two-credit course, it must be counted as 1 credit in the calculation stated in (1). The remaining 1 credit can be included in the top 14 credits stated in (2).
   If the last of the top 14 credits was earned in a two-credit course, it must be counted as 1 credit in the calculation stated in (2).
4. In the top 14 credits, students can include up to 4 from among English language courses (English 1, English 2, English 3, and English 4) listed in A) and an English proficiency test. (The maximum total points is 400.)
5. Students who complete both Wellness Exercise and Advanced Wellness Exercise courses listed in B) can include 1 credit earned in either course in the top 14 credits.
6. Tables A) and B) do not include courses that were offered in AY 2020 or earlier and will not be offered from AY 2021 onwards.
7. Courses with course numbers beginning with "Z" (e.g., ZMA.C101) were offered before Tokyo Tech's education reform, and will not be considered when determining department affiliation.

2. Bachelor's degree programs

Students who are affiliated with a department set up study plans of their own, while also receiving guidance from their academic advisors and others, and take courses according to their plans. Every undergraduate major provides what is called a standard curriculum for this purpose, and it is practical and effective to work according to that plan. Depending on their purpose, however, there may be cases when students set up a program other than the standard curriculum.

Cases that follow the standard curriculum

The standard curriculum covers standard content that students should learn so they will be able to function in the world as researchers, engineers, etc. in their respective field when they embark on their careers. The timetable is organized so that it will not present obstacles to that learning. Table 10 shows the standard curricula for every undergraduate major.

Details of each standard curriculum will be given later. The conditions laid out in these study programs allow for a certain amount of freedom, so it is possible to some extent to take courses that are part of other study programs. If that is your objective, please set up your study plan in consultation with your department chair, your academic advisors, etc.

Table 10. Standard curricula for every undergraduate major

School	Undergraduate major	Standard curriculum
School of Science	Undergraduate Major in Mathematics	Standard curriculum for Undergraduate Major in Mathematics
	Undergraduate Major in Physics	Standard curriculum for Undergraduate Major in Physics
	Undergraduate Major in Chemistry	Standard curriculum for Undergraduate Major in Chemistry
	Undergraduate Major in Earth and Planetary Sciences	Standard curriculum for Undergraduate Major in Earth and Planetary Sciences
School of Engineering	Undergraduate major in Mechanical Engineering	Standard curriculum for Undergraduate Major in Mechanical Engineering
	Undergraduate Major in Systems and Control Engineering	Standard curriculum for Undergraduate Major in Systems and Control Engineering
	Undergraduate Major in Electrical and Electronic Engineering	Standard curriculum for Undergraduate Major in Electrical and Electronic Engineering
	Undergraduate Major in Information and Communications Engineering	Standard curriculum for Undergraduate Major in Information and Communications Engineering
	Undergraduate Major in Industrial Engineering and Economics	Standard curriculum for Undergraduate Major in Industrial Engineering and Economics

School of Materials and Chemical Technology	Undergraduate Major in Materials Science and Engineering	Standard curriculum for Undergraduate Major in Materials Science and Engineering
	Undergraduate Major in Chemical Science and Engineering	Standard curriculum for Undergraduate Major in Chemical Science and Engineering
School of Computing	Undergraduate Major in Mathematical and Computing Science	Standard curriculum for Undergraduate Major in Mathematical and Computing Science
	Undergraduate Major in Computer Science	Standard curriculum for Undergraduate Major in Computer Science
School of Life Science and Technology	Undergraduate Major in Life Science and Technology	Standard curriculum for Life Undergraduate Major in Science and Technology
School of Environment and Society	Undergraduate Major in Architecture and Building Engineering	Standard curriculum for Undergraduate Major in Architecture and Building Engineering
	Undergraduate Major in Civil and Environmental Engineering	Standard curriculum for Undergraduate Major in Civil and Environmental Engineering
	Undergraduate Major in Transdisciplinary Science and Engineering	Standard curriculum for Undergraduate Major in Transdisciplinary Science and Engineering

Cases that do not follow the standard curriculum

When students wish to pursue a program of study that does not follow the standard curriculum laid out by the undergraduate major, they are also able to set up study plans that are separate from standard curricula, choose appropriate courses, and take those courses.

In these cases, when students become affiliated with a department, at the same time they should also create a written plan with courses that correspond to those in the standard curriculum. They must receive the approval of the chair of their affiliated department as early as possible during the registration period in April, and submit the approved plan to the dean of the School.

The documentation can be submitted at the Student Division.

This plan will cover the entire period from department affiliation to graduation, and therefore requires care and deliberation. In any event, the plan is most likely to be generally in accord with the standard curriculum recommended in that undergraduate major up to the end of the second year. When setting up this kind of plan, it is also necessary to examine the timetable and arrange the plan so that it presents no obstacles to your studies.

Students who have passed the “B2D Special Selection (B2D Scheme)” will study under a tailored curriculum that is different from the standard curriculum set by each department.

4. Confederation of the Four Universities (Multidisciplinary Program)

In March 2001, Tokyo Medical and Dental University, Hitotsubashi University, Tokyo University of Foreign Studies, and Tokyo Institute of Technology concluded the "Confederation of the Four Universities" agreement for mutual academic exchange, and established multidisciplinary joint education courses. These courses provide our students with the opportunity to pursue advanced studies in a specialized field outside Tokyo Tech while continuing their professional and technological education at the Institute. When students have earned the required number of credits from each participating university in their chosen course, they will be awarded a certificate of completion.

Students who belong to a department are eligible to apply for the courses. Other students may be eligible if they will belong to a department the following academic year. Permission to enroll is granted after a selection process by Tokyo Tech's program office, etc.

Applications will be accepted from around late September to late November, and decisions on applications will be made around early April of the following year.

The following is a list of courses offered under the confederation. Detailed information is available at: http://www.gakumu.titech.ac.jp/kyoumu/yondai/english. Please also check the study guide to be released in late September on the web.

1. Courses with four participating universities
   - ① Overseas Cooperation Course (Tokyo Medical and Dental University, Tokyo University of Foreign Studies, Hitotsubashi University, and Tokyo Institute of Technology)
2. Courses with three participating universities
   - ② Comprehensive Life Sciences Course (Tokyo Medical and Dental University, Hitotsubashi University, and Tokyo Institute of Technology)
   - ③ Research on Living Spaces Course (Tokyo Medical and Dental University, Hitotsubashi University, and Tokyo Institute of Technology)
3. Courses with two participating universities
   - ④ Scientific Technology and Intellectual Property Course (Hitotsubashi University and Tokyo Institute of Technology)
   - ⑤ Technology and Management Course (Hitotsubashi University and Tokyo Institute of Technology)
   - ⑥ General Arts and Sciences Course (Hitotsubashi University and Tokyo Institute of Technology)
   - ⑦ Medical Engineering Course (Tokyo Medical and Dental University and Tokyo Institute of Technology)
   - ⑧ International Technical Writing Course (Tokyo University of Foreign Studies and Tokyo Institute of Technology)
   - ⑨ Course for comprehensive study of medical care, long-term care, and economic systems (Tokyo Medical and Dental University and Tokyo University of Foreign Studies)

     Note: This course is not available for Tokyo Tech students.

5. Global Scientists and Engineers Course

1. Course description and aims

The Global Scientists and Engineers Course (GSEC) focuses on providing a curriculum that enables bachelor's and master's degree program students to develop the necessary competencies to excel in the global arena. Students will possess fundamental assets such as (a) global mindset, (b) global practical skills, and (c) global collaboration skills. GSEC aims to foster scientists and engineers capable of making international contributions through science and technology and addressing unexplored issues of global society in ways that respect ethical values and diversity, while maintaining awareness of their own identity, knowledge, experience, and technical expertise.

The GSEC consists of the following three levels:

1. Global Scientists and Engineers Course – Basic
2. Global Scientists and Engineers Course – Intermediate
3. Global Scientists and Engineers Course – Advanced

At the basic and intermediate levels, GSEC aims to develop students' global awareness, English proficiency and communication skills, cross-cultural adaptability and teamwork ability, problem identification and solving ability, and practical skills pertaining to global competencies. In addition, students are expected to gain the following capabilities through international experience: a broader perspective, an appreciation of diversity and collaboration with people from other countries, and improved communication skills in foreign languages.

The Intermediate level is deemed as a standard course of study, and the Basic level is a preliminary level for Intermediate. The Advanced level is for students who have completed the Intermediate level.

GSEC acknowledges the acquisition of international experience as one of Tokyo Tech's key goals in education. After completing the Intermediate level, students will have gained the capabilities that Tokyo Tech expects its students to acquire through international experience.

2. Course information

For information such as course titles and numbers, refer to lists of completion requirements via http://www.ghrd.titech.ac.jp/en/.

3. Completion requirements

In order to complete each level of GSEC, students must obtain credits in the designated courses and satisfy the conditions below.

1. Global Scientists and Engineers Course – Basic
   Attain at least 9 credits from among the courses on the completion requirements list, and the minimum test score of one of the following to prove English proficiency: TOEFL iBT, 72 points; TOEFL ITP, 533 points; TOEIC, 680 points
2. Global Scientists and Engineers Course – Intermediate
   Attain at least 15 credits (including 9 required to complete the basic level) from among the courses on the

completion requirements list, and the minimum test score or level of one of the following to prove English proficiency: TOEFL iBT, 80 points; TOEFL ITP, 550 points; TOEIC, 750 points; IELTS 6.0 points; EIKEN Grade Pre-1

* For details, please refer to the Global Scientists and Engineers Course website (http://www.ghrd.titech.ac.jp/w/).

6. Early graduation

Students who earn excellent grades will be able to graduate after three years or more and less than four full years in a bachelor's degree program. In light of their abilities and the implementation of an appropriate education, students desiring early graduation and who are able to earn excellent grades in a large number of courses are not expected to spend a uniform four years as enrolled students. Instead, this system provides for students who are recognized by the university as being qualified to graduate early, advance to graduate school not only in Japan but in another country, or take their places as active members of society. The system therefore allows for graduation in fewer than four full years of enrollment.

Application for early graduation and the procedure for early graduation must meet the following conditions.

1. Students who are able to apply for early graduation (students eligible for early graduation)

   Students must have a GPT of 3.50 or higher at the end of the semester during which the day they reach a period of enrollment of two years and six months or three years occurs. They must have earned 110 credits or more in courses in accordance with Article 20 of the Academic Regulations, and must have satisfied the requirements to qualify to apply for the independent research project for a bachelor's degree.

2. Requirements for early graduation

   Students whose eligibility for early graduation has been recognized, who have taken the prescribed courses, who have earned the number of credits specified by the School as 124 credits or more, and who both have excellent grades and have passed the review of their independent research project for a bachelor's degree.

Note: Early graduation is applicable to students who enrolled at Tokyo Tech in or after April 2001. Students who were admitted by transfer from a junior college or a technical college are not eligible for this early graduation.

For further information regarding recognition of eligibility to apply for early graduation, graduation requirements, the independent research project for a bachelor's degree, graduation timing, and other such matters, please refer to the undergraduate major section in the Study Guide and to the Regulations Regarding Early Graduation at Tokyo Institute of Technology. If you are interested in applying for early graduation, please consult in advance with your academic advisors and department chair.

There is an early admission system that is different from the system for early graduation. Early admission to graduate school does not entail graduation in a bachelor's degree program.

7. Early admission to graduate school

A student who is recognized by the graduate school as having been enrolled at the university for three years or more, and having earned the prescribed credits with excellent grades in a bachelor's degree program will be granted eligibility for admission to graduate school and will be allowed to take entrance exams. This is called early admission.

The point of early admission is the notion that implementing graduate school education earlier will be more effective for students with excellent qualifications. Therefore, this system allows recognition of eligibility for admission to graduate school for students who have been enrolled at the university for three years or more and who have earned the designated credits prescribed by the graduate school, even if they have not graduated from a bachelor's degree program.

Students who apply for early admission to a master's degree program in graduate school here at Tokyo Tech must meet conditions like the following.

(1) Students are to have a GPT of 3.00 or higher at the point when they have been enrolled at Tokyo Tech for two years. As a rule, they are also to have earned 90 credits or more.
(2) By the time of admission to graduate school at Tokyo Tech, students as a rule are to have satisfied the graduation requirements for required courses in the core course group prescribed by the undergraduate major (excluding the independent research project for a bachelor's degree) and for restricted elective courses. They are also to have prospects for earning 60 credits or more from the core course group as well as the credits in the liberal arts courses group required for graduation (13 credits in humanities and social science courses, 9 credits in English language courses, 4 credits in second foreign language courses, and 14 credits in basic science and technology courses).

The question of whether students whose eligibility for admission has been recognized are actually appropriately qualified to receive a graduate education is judged by entrance exams and other such means. It is necessary to pay close attention to requirements, since in some cases, early admission to graduate school may also require applicants to have graduated from an undergraduate school of the university by means of various national exams or other qualifying exams.

Inquiries about early admission should be directed to the Admissions Division of the Suzukakedai Student Division.

If you are interested in applying for early admission, please consult in advance with your academic advisors and department chair.

Note: Early admission will entail withdrawal from Tokyo Tech. Students who take early admission and also want to acquire a bachelor's degree must first meet all requirements and then apply to the National Institution for Academic Degrees and University Evaluation for conferral of a degree. If those students pass the review, they will be granted a bachelor's degree by the National Institution for Academic Degrees and University Evaluation. However, please be aware that this does not constitute university graduation.

8. Advancing to graduate school

Tokyo Tech established a graduate school in order to provide, in addition to the general learning and specialized knowledge that students acquire in a bachelor's degree program, further deepening of scholarship and cultivation of research capabilities. The curriculum is systematically organized for the bachelor's degree program and master's degree program, and for the master's degree program and the doctoral second-stage program. After students advance to the graduate school master's degree program or to the doctoral second-stage program, they will be affiliated with a department in one of the Schools and will choose a graduate major provided by the undergraduate major for their educational program. Students who advance to a professional degree program will be affiliated with the School of Environment and Society.

There are also interdisciplinary educational programs set up as graduate majors that span multiple undergraduate majors in order to develop human resources in new academic fields that are needed in society. (These multidisciplinary graduate majors are marked with a ★ symbol in Table 11.)

Table 11 shows the admissions capacity of each undergraduate major, graduate major, and School.

In the master's degree program, students pursue focused options for learning in which they concentrate on their major field of specialization in the graduate major or professional degree program that they themselves choose. There are also programs offering interdisciplinary options in which students pursue considerable amounts of study in other fields of specialization in addition to the main courses in their major field of specialization. The purpose of the interdisciplinary options is not only for deeper learning in the major field, but also to broaden perspectives and to acquire a certain amount of knowledge in other specialized fields. It includes (1) graduate minor programs and (2) progressive graduate minor programs.

(1) Overview of graduate minor programs

・Every graduate major and professional degree program offers graduate minor programs.

On completion of a program, a certificate of completion is awarded at the time the master's degree program is completed.

・The core and essence of the minor field can be studied from foundation up.

・Application for a graduate minor program occurs after admission to a master's degree program. Depending on the program, the plan may be organized systematically starting with 200-level courses, in some cases, and **students can take such courses while they are still enrolled in a bachelor's degree program.**

Credits are handled as follows.

Program in which graduate minor courses are taken	Course level Code	Handling of credits acquired by completion of graduate minor courses	Whether or not credits can be included in program graduation or completion credits (bachelor's degree graduation credits or master's degree completion credits)
<Bachelor's degree program>	200	Handle as graduate minor	Bachelor's graduation credit: Yes Master's completion credit: No
	300		Bachelor's graduation credit: Yes Master's completion credit: No

<Bachelor's degree program (when requirements to start independent research project for the bachelor's degree have been satisfied)>	400	completion credits	Bachelor's graduation credit: No Master's completion credit: Yes if application made after admission to master's degree program
Reference: <Master's degree program>	200		Master's completion credit: No
	300		Master's completion credit: No
	400		Master's completion credit: Yes
	500		Master's completion credit: Yes

(2) Overview of progressive graduate minor programs

・A special program is configured to unite study that cuts across multiple specialized fields.

On completion of a program, a certificate of completion is awarded at the time the master's degree program is completed.

・The program is basically configured from 400-level or higher courses, so students will not be able to take the courses before they begin their independent research project for a bachelor's degree.

Table 11. Admissions capacity of Schools, etc.

(1) Master's degree program and Doctoral second-stage program

School	Undergraduate major or graduate major		Master's degree program Admissions Capacity (Number of students)	Doctoral second-stage program Admissions Capacity (Number of students)
School of Science	Undergraduate Major in Mathematics	Graduate Major in Mathematics	154	52
	Undergraduate Major in Physics	Graduate Major in Physics		
	Undergraduate Major in Chemistry	Graduate Major in Chemistry Graduate Major in Energy Science and Engineering★		
	Undergraduate Major in Earth and Planetary Sciences	Graduate Major in Earth and Planetary Sciences		
School of Engineering	Undergraduate Major in Mechanical Engineering	Graduate Major in Mechanical Engineering Graduate Major in Energy Science and Engineering★ Graduate Major in Engineering Sciences and Design★ Graduate Major in Human Centered Science and Biomedical Engineering★ Graduate Major in Nuclear Engineering★	477	169
	Undergraduate Major in Systems and Control Engineering	Graduate Major in Systems and Control Engineering Graduate Major in Engineering Sciences and Design★		

	Undergraduate Major in Electrical and Electronic Engineering	Graduate Major in Electrical and Electronic Engineering Graduate Major in Energy Science and Engineering★ Graduate Major in Human Centered Science and Biomedical Engineering★ Graduate Major in Nuclear Engineering★		
	Undergraduate Major in Information and Communications Engineering	Graduate Major in Information and Communications Engineering Graduate Major in Engineering Sciences and Design★ Graduate Major in Human Centered Science and Biomedical Engineering★		
	Undergraduate Major in Industrial Engineering and Economics	Graduate Major in Industrial Engineering and Economics Graduate Major in Engineering Sciences and Design★		
School of Materials and Chemical Technology	Undergraduate Major in Materials Science and Engineering	Graduate Major in Materials Science and Engineering Graduate Major in Energy Science and Engineering★ Graduate Major in Human Centered Science and Biomedical Engineering★ Graduate Major in Nuclear Engineering★	347	129
	Undergraduate Major in Chemical Science and Engineering	Graduate Major in Chemical Science and Engineering Graduate Major in Energy Science and Engineering★ Graduate Major in Human Centered Science and Biomedical Engineering★ Graduate Major in Nuclear Engineering★		
School of Computing	Undergraduate Major in Mathematical and Computing Science	Graduate Major in Mathematical and Computing Science Graduate Major in Artificial Intelligence★	135	50
	Undergraduate Major in Computer Science	Graduate Major in Computer Science Graduate Major in Artificial Intelligence★ Graduate Major in Human Centered Science and Biomedical Engineering★		
School of Life Science and Technology	Undergraduate Major in Life Science and Technology	Graduate Major in Life Science and Technology Graduate Major in Human Centered Science and Biomedical Engineering★	168	52
School of Environment and Society	Undergraduate Major in Architecture and Building Engineering	Graduate Major in Architecture and Building Engineering Graduate Major in Urban Design and Built Environment★ Graduate Major in Engineering Sciences and Design★	263	115

	Undergraduate Major in Civil and Environmental Engineering	Graduate Major in Civil Engineering Graduate Major in Urban Design and Built Environment★ Graduate Major in Engineering Sciences and Design★		
	Undergraduate Major in Transdisciplinary Science and Engineering	Graduate Major in Global Engineering for Development, Environment and Society Graduate Major in Energy Science and Engineering★ Graduate Major in Engineering Sciences and Design★ Graduate Major in Nuclear Engineering★		
	Undergraduate Major in Social and Human Sciences	Graduate Major in Social and Human Sciences		
	Undergraduate Major in Innovation Science	Graduate Major in Innovation Science (* Doctoral second-stage program only)		
Total			1,544	567

(2) Professional degree program

School	Program	Admissions Capacity
School of Environment and Society	Graduate Major in Technology and Innovation Management	40 Students
Total		40

9. Taking graduate school courses

Students who have received permission to take the independent research project for a bachelor's degree, etc. can take 400-level courses for up to a maximum of 10 credits. However, these will not count as credits for the bachelor's degree program. After admission to graduate school, if students submit another application for registration in those courses when they are offered, and submit the prescribed form to the Ookayama Student Division or the Suzukakedai Student Division, then they can receive those credits in their graduate school program.

Note:

- In some cases, the maximum number of such credits may be lower than 10 credits in the department that students are affiliated with in their bachelor's degree program.
- After admission to graduate school, if the courses that were taken during a bachelor's degree program are not offered because they were cancelled or because the courses no longer exist, then credits from them will not be recognized in the graduate school program. In the event that a course name is changed, there is a possibility that the credit will be recognized. Therefore please check with the Student Division.
- These Credits do not meet graduation requirements, so they do not affect the GPA, GPT, maximum credit load system (Upper limit on number of credits in application for registration) in the bachelor's program.

(The following is an unofficial translation of 「東京工業大学学士課程の学生が大学院授業科目を履修する場合の取扱い」.)

Terms for Bachelor's Degree Students of Tokyo Institute of Technology to Take Graduate Level Courses

Article 1

This document prescribes necessary matters concerning students in a bachelor's degree program at Tokyo Institute of Technology ("Tokyo Tech") who wish to register for and take graduate level courses.

Article 2

Students who fall under either of the following can request registration for graduate level courses.

i. Have been admitted to conduct an independent research project for a bachelor's degree
ii. Have received a preliminary admittance to a graduate program at Tokyo Tech
iii. Have been selected as a B2D student described in article 4 of the guidelines for the B2D Scheme (東京工業大学B2Dスキーム実施要項) and satisfy separately specified requirements

Article 3

While enrolled in a bachelor's program, students specified in the preceding article may be allowed to take 400-level courses (excluding Humanities and Social Science Courses, Career Development Courses, and research seminars) as long as the total number of credits they register for do not exceed 10*, provided that they have prior approval from their academic supervisors and the relevant course instructors.

Article 4

Even if students complete graduate level courses prescribed in the preceding article with a passing grade, credits

earned from those courses will not be recognized as credits for a bachelor's degree. However, if students advance to a graduate program and the graduate level courses that they passed are still offered, those credits will be awarded as long as the set procedures are followed.

Article 5

Necessary matters in addition to those outlined in this document will be prescribed separately by each School.

* Regardless of whether students succeed or fail to attain credits as a result, a maximum number they can register for is 10.

10. Guide to humanities and social science courses

No matter how advanced or sophisticated knowledge may be, just possessing it will not enable you to apply that knowledge properly in the real world. What is needed for that is the liberal arts. The liberal arts education at Tokyo Tech helps you discern the role you should play in society (sociality), simultaneously awakens the dormant possibilities within yourself (humanity), and also helps you to initiate action while interacting with a diversity of people (creativity). We urge you to take on a variety of different challenges through liberal arts courses, and in that way to acquire the intelligence, the techniques, and the self-confidence to interact with people in the world as well as to vitalize your own life.

Liberal arts core study courses (required courses)

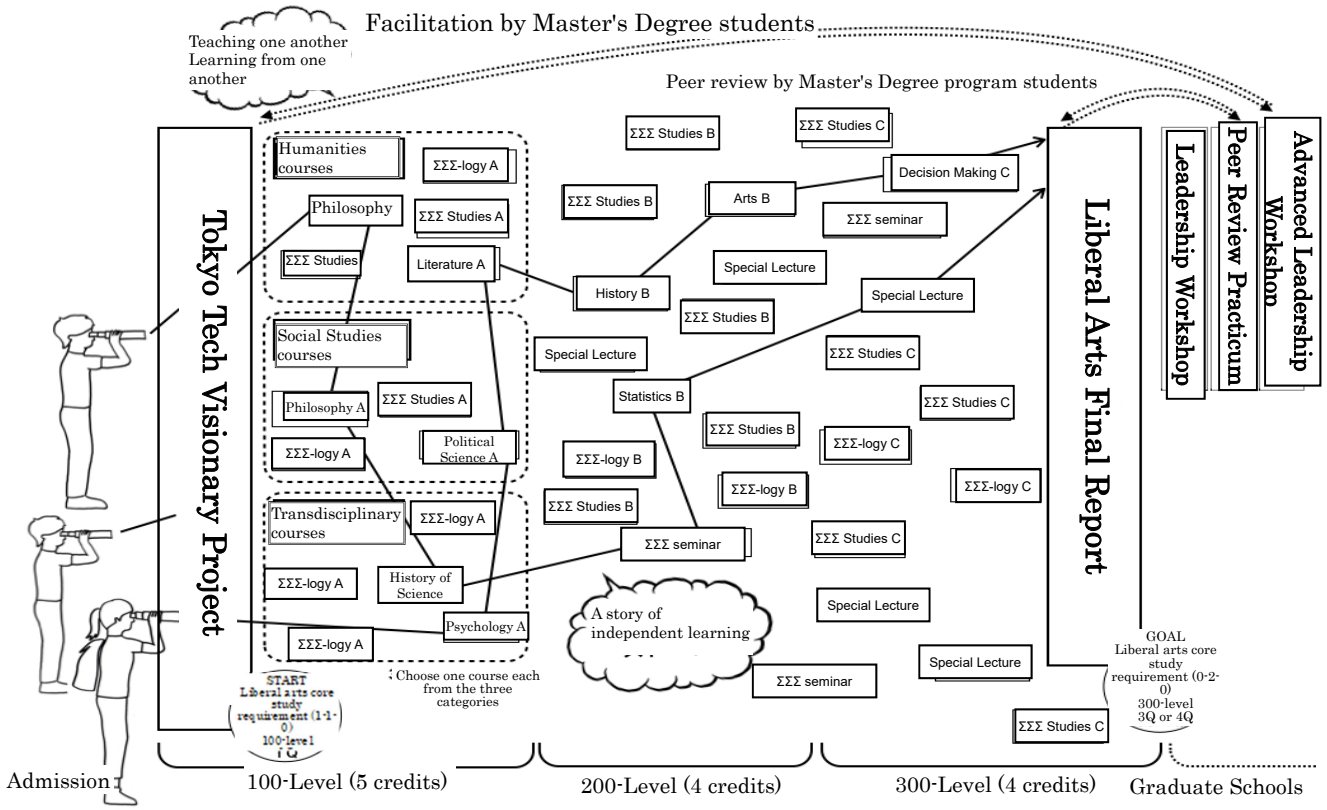
These are courses that make up the core of liberal arts education at Tokyo Tech. From the first year in a School up to the doctoral program, such courses are largely offered in alternate years so that they will be a consistent, continuing presence throughout the liberal arts education. Courses of this category that students take in the bachelor's degree programs include the 100-level Tokyo Tech Visionary Project and the 300-level Liberal Arts Final Report. These are all required courses. The course numbers start with the LAH.C prefix.

<Tokyo Tech Visionary Project>　100-level, 1Q, Mon & Thu 3-4 or 5-6 class periods, required 2 credits

This course is like a gateway that everyone passes through when they first enter Tokyo Tech, and is thus limited to first-year undergraduate students. The course involves alternating sessions of lectures to large numbers of students in an auditorium and groupwork with a small number of students to relate the lecture content to the students' own experiences and values, thereby gaining a new understanding. By all means cast off the entrance exam mindset with its focus on higher scores, and acquire the attitude of university learning. Two units make up one class, and an instructor will be present. Please note carefully that each unit meets in a different class period.

<Liberal Arts Final Report>　300-level, 3Q or 4Q, Mon & Thu 3-4 class periods, required 2 credits

This is the culmination of the liberal arts education in the bachelor's degree program, and stands as the gateway by which students make their exit. They have taken courses in the liberal arts in accordance with their own particular stories. Think about what you have been able to learn, then turn back around and tie it in with your vision for the future. After a number of guidance sessions, the classes that met for the Tokyo Tech Visionary Project will come back together again in small groups where students will confirm each other's progress while proceeding with their own writing. Reports go through a process of peer review conducted by specially trained graduate students in the master's degree program, being rewritten multiple times as the work goes forward. The course is taken in different quarters by different units.



Elective liberal arts courses (restricted elective courses)

Tokyo Tech offers elective liberal arts courses in a considerable variety that covers the main academic fields. The choice of which of those courses to take is up to you. Following in the course of the interests that emerged in the Visionary Project, you put together the story of your learning in your own way.

The elective liberal arts courses are divided into the three categories of Humanities, Social Studies, and Transdisciplinary studies.

・Humanities: Philosophy, literature, and other such courses that explore the human being and culture (Courses are numbered with the prefix LAH.H)

・Social studies: Law, political science, and other such courses related to the structures and workings of society (Courses are numbered with the prefix LAH.S)

・Transdisciplinary: History of science, statistics, and other such courses combining humanistic and scientific studies (Courses are numbered with the prefix LAH.T)

There are some courses that proceed in sequence within a single academic field, e.g., from "XxxΣΣΣ Studies A" (100-level) to "ΣΣΣ Studies B" (200-level) to "ΣΣΣ Studies C" (300-level), and one-off courses such as "Special Lecture in ΣΣΣ." Even with courses that progress from A to B to C, students do not necessarily have to take every course in the sequence or in that order. The course content is devised so that you can take only the B course, or only the C course without it being a problem.

<u>Notes about taking elective liberal arts courses at the 100-level</u>

At the 100-level, in the first quarter students take the Tokyo Tech Visionary Project (two credits), which is a

required course. After that, in the second to fourth quarters, students take three elective liberal arts courses (one credit each). These three courses must comprise one course each from the above Humanities, Social Studies, and Transdisciplinary categories. Therefore it is not possible to take multiple courses from the same category. The purpose of this rule is to give students early contact with a wide range of academic fields and a grasp of the relationships among fields of study as well as an overview of the whole. No condition of this kind is imposed on elective liberal arts courses at the 200- and 300-levels.

Seminars

For students eager to learn about the academic fields in the humanities study in greater depth, there are courses that bring a small number of students together with the professor for more conscientious study. These courses are seminars. Participants read specialized works, debate them vigorously, and sometimes just talk together in a warm, harmonious atmosphere. Seminars differ from regular courses in that they take place over the two quarters in a semester (1Q and 2Q or 3Q and 4Q). Also, a single seminar is made up of eight courses so that students can repeat the same seminar over a four-year period. The class periods when a seminar is held depend on the professor, so please check the meeting times on the syllabus or in guidance sessions.

Example:

100-level	1Q–2Q	Seminar on Humanities (Art workshop) Introduction 1
100-level	3Q–4Q	Seminar on Humanities (Art workshop) Introduction 2
200-level	1Q–2Q	Seminar on Humanities (Art workshop) 1
200-level	3Q–4Q	Seminar on Humanities (Art workshop) 2
300-level	1Q–2Q	Seminar on Humanities (Art workshop) 3
300-level	3Q–4Q	Seminar on Humanities (Art workshop) 4
300-level	1Q–2Q	Seminar on Humanities (Art workshop) 5
300-level	3Q–4Q	Seminar on Humanities (Art workshop) 6

Number of credits required for graduation

100-level 2 credits in required courses 3 credits in restricted elective courses (1 each from humanities, social studies, and transdisciplinary studies)

200-level 4 credits in restricted elective courses

300-level 2 credits in required courses 2 credits in restricted elective courses

Note: Students are not permitted to count credits from 100-level research seminars as part of the 3 credits to be attained from 100-level restricted elective courses in order threesixto fulfil graduation requirements. (They may count credits from 200-level and 300-level research seminars as part of those attained from restricted elective courses at equivalent levels to fulfil graduation requirements.)

Undergraduate Courses

Check course syllabi regularly for the most up-to-date information about possible changes in the schedule. There may be cases where courses are cancelled or weekly classes are switched to intensive classes.

Courses marked with ★ are taught in English.

Course level	Quarter	Day of week	Class period	Humanities courses	Social Studies courses	Transdisciplinary courses
100	1Q	Mon & Thu	3, 4	Visionary Project		
			5, 6	Visionary Project		
	2Q	Mon	5, 6	Communication A Special Lecture: Language and Culture Studies of Culture and Representation A Cultural Anthropology A Special Lecture: Social and Cultural Diversity	International Relations A Sociology A Law (Civil Law) A Economics A Special Lecture: Introduction to Management	Science and Technology for Society A Decision Making A Learning Design Special Lecture: Thinking and learning through museums Studies on Future Society A
	3Q	Mon	5, 6	Art A History A Introduction to Foreign Languages 2 Special Lecture: Language and Culture	Psychology A Special Lecture: Social Issues and Communication Special Lecture: Southeast Asia	Statistics A Ethics in Engineering A Social Modeling A History of Science A
	4Q	Mon	5, 6	Literature A Religion A Philosophy A Human Studies A	Law (Constitutional Law) A Political Science A Special Lecture: History of Fashion Media Studies A Special Lecture: Disability Studies	History of Technology A Philosophy of Science A Linguistics A Special Lecture: Technology and art
		Fri	7, 8			Special Lecture: Introduction to the Design of Future Society
200	1Q	Tue & Fri	5, 6	Philosophy B Intercultural Studies: Asia and Africa Human Studies B	Special Lecture: Contemporary Society International Relations B	Science and Technology for Society B Decision Making B Special Lecture: History of Universities Special Lecture: History of biology
		Fri	7, 10		Economics B	
	2Q	Mon & Thu	1, 2	Religion B Intercultural Studies: Europe and Latin America	Law (Constitutional Law) B Political Science B Psychology B Special Lecture: Japan's economy, from the point of view of data and various topics	Statistics B, History of Science B Linguistics B Special Lecture: Physical Activity Special Lecture: Science, Literature, and Humanism
	3Q	Mon & Thu	1, 2	Arts B, Literature B, History B Communication B World Literature 1 Special Lecture: Introduction to Opera	Special Lecture: International society and Communication Media Studies B	History of Science B Philosophy of Science B
		Thu	1, 2	Special Lecture: Fundamentals of Japanese Culture		
	4Q	Mon & Thu	1, 2	World Literature 2 Cultural Anthropology B Studies of Culture and Representation B	Law (Civil Law) B Sociology B	Social Modeling B Ethics in Engineering B Studies on Future Society B
		Thu	1, 2	Special Lecture: Art and Design		
300	1Q	Tue & Fri	7, 8	Religion C Special Lecture: Intellectual History in Japan	Political Science C Sociology C International Relations C	Philosophy of Science C Social Modeling C Linguistics C Special Lecture: Sports Science
		Fri	7, 10	Special Lecture: Introduction to edX online course creation		
	2Q	Mon & Thu	3, 4	Cultural Anthropology C Arts C, Literature C Studies of Culture and Representation C Human Studies C	Media Studies C	Science and Technology for Society C Decision Making C History of Science C History of Technology C
		Thu	7, 10	Special Lecture: Introduction to online course video creation		
	3Q	Mon & Thu	3, 4	Liberal Arts Final Report		
				Special Lecture: Gender	Economics C	
		Mon & Thu	5, 6	Philosophy C	Special Lecture: Media Psychology Law (Intellectual Property Law) C	Special Lecture: Human Relations Studies on Future Society C
		Thu	5, 6	Special Lecture: Urban Space in Literature and Cinema Special Lecture: Traditional Japanese Theater and Music (Noh and Kyogen)	Special Lecture: American studies	
	4Q	Mon & Thu	3, 4	Liberal Arts Final Report		
				History C	Law (Constitutional Law) C Law (Civil Procedure Law) C Psychology C	Ethics in Engineering C Special Lecture: Environment Statistics C
		Mon & Thu	5, 6	Special Lecture: Urban Space for the Future Special Lecture: Traditional Japanese Theater and Music (Kabuki and Bunraku)		

Seminars

100	1Q–4Q	(Culture, Society, and Humanity) Introduction 1,2 (Facilitating dialogue, collaboration, and bliss) Introduction 1,2 (Art workshop) Introduction 1,2 (Religion and Spirituality in Contemporary Society) Introduction 1,2 (Museum and History) Introduction 1,2	(Japanese Law Study Seminar) Introduction 1,2 (Sociology of media and governance) Introduction 1,2 (US-Japan Relations: Military Base Problem in Okinawa) Introduction 1,2 (Psychology) Introduction 1,2 (Politics and Society) Introduction 1,2	(Decision Making) Introduction 1,2 (Introduction to Quantitative Approach to Social Science) Introduction 1,2
200 300	1Q–4Q	(Culture, Society and Humanity) 1－6 (Facilitating dialogue, collaboration, and bliss) 1－6 (Art workshop) 1－6 (Religion and Spirituality in Contemporary Society) 1－6 (Museum and History) 1－6	(Japanese Law Study Seminar) 1–6 (Sociology of media and governance) 1–6 (US-Japan Relations: Military Base Problem in Okinawa) 1–6 (Psychology) 1–6 (Politics and Society) 1–6	(Decision making) 1–6 (Introduction to Quantitative Approach to Social Science) 1–6

11. Guide to English language courses

English language courses

The purpose of the English language courses is to heighten your abilities in English as a foreign language so that you will be able to acquire the competency in English that is necessary for pursuing study or research in the future. It is also intended to foster a stance of active participation in English communication. A further purpose is to deepen students' knowledge and understanding of the culture of other countries in general in order to enable communication to take place more smoothly when engaged in Study Abroad or international research.

English language courses include the required courses of English 1 to English 9, while elective courses include Oral Expression in English and other courses. The types of elective courses and the quarters when they are offered are shown in Table 13.

Required English language courses

The 100-level courses English 1 to English 4 are respectively offered from the first quarter to the fourth quarter. These are required courses, and all students take them in their assigned classes. The 200-level courses English 5 to English 8 are similarly respectively offered from the first quarter to the fourth quarter. These are also required courses that all students take in their assigned classes.

English 1 and English 2 are positioned as courses that foster international awareness. They are primarily intended to heighten awareness and interest in future Study Abroad or research in other countries, and they aim to build a foundation for improving students' comprehensive English language proficiency.

English 3 and English 4 are made up of two types of class. The reading and writing class focuses on reading comprehension and composition while the listening and speaking class focuses on listening comprehension and oral expression. Students make a choice in advance of the type they want to study, and take the class that is assigned.

English 5 and English 6, as well as English 7 and English 8, are also made up of classes of the two types, reading and writing and listening and speaking. Students are all assigned to one reading and writing class in the spring semester or fall semester and one listening and speaking class in the spring semester or fall semester. (They will either be assigned to the combination of reading and writing class in the spring semester and listening and speaking class in the fall semester, or the combination of listening and speaking class in the spring semester and reading and writing class in the fall semester. Students cannot choose the order of classes.)

The 300-level course English 9 is held in the first quarter. Credits are awarded when students report receiving a score at the prescribed passing level or better in the TOEFL ITP test that is administered by Tokyo Tech in the third year of admission, or in the public TOEFL iBT, TOEFL ITP, or TOEIC Listening & Reading tests that students can take individually in the third year of admission. Grading is on a pass-fail basis. Details about English 9 are made known separately by announcements and other such means.

Table 12. Required English language courses

Course level	Course	Number of credits	Recommended quarter to take course
100-level	English 1	0-1-0	1Q
	English 2	0-1-0	2Q
	English 3	0-1-0	3Q
	English 4	0-1-0	4Q
200-level	English 5	0-1-0	1Q
	English 6	0-1-0	2Q
	English 7	0-1-0	3Q
	English 8	0-1-0	4Q
300-level	English 9	0-1-0	1Q

Reapplying for and retaking required courses and exams for credit recognition

In the event that a failing score renders students unable to acquire the credits for English 1 to English 8 in the recommended quarter for taking the courses, then as a rule, students must reapply for the course and retake it in the following quarter or later.

When timetable considerations make reapplication difficult, students can earn the credits by means of exams for credit recognition. However, only students who have taken the course in question in the past and received a failing grade are eligible to take an exam for credit recognition. (Students who received a grade of zero when they failed are not eligible to take the exam.) The number of credits that can be recognized by means of exams for credit recognition is limited to two credits from English 1 through English 8. Students who want to take an exam for credit recognition must take part in the guidance sessions at the start of the spring and fall semesters, and they must receive permission to take the exam. One of two grades is possible, either pass (uniformly 60 points) or fail.

If students fail to successfully complete English 9 in the recommended quarter, they must register for and retake the course in the third quarter of the third year of their admission or later. When retaking English 9, the determination of student grades will also include class evaluations (including final exams and so on). In cases where students register for and repeat the course but fail to complete it in the third or fourth quarter of the fourth year of admission or later, they may need to take a reexamination.

Proficiency tests for recognition of required credits (English language courses)

Students who receive a certain level of grade in English language proficiency tests may be able to receive credit for English language courses after undergoing the necessary review. Students wishing to have credit recognized must apply during the designated period at the start of the spring or fall semester. Of the 8 credits in 100-level and 200-level required courses (from English 1 to English 8), the number that can be recognized, combined with already earned credit, is a maximum of 8 credits. Grades in courses for which students receive this credit will be 100 points. However,

grades in courses for which credit has already been received will not be changed. The proficiency tests that can be considered for credit are shown below. (Results in the TOEFL and IELTS can only be used during the period of validity for scores.)

EIKEN Test in Practical English Proficiency (Eiken Foundation of Japan)	Grade 1
TOEIC Listening & Reading	875 points or higher
TOEFL iBT	100 points or higher
TOEFL PBT	600 points or higher
IELTS	7.0 or higher

Required credits in English language courses

In order to satisfy the requirements for eligibility for graduation, students must earn all 9 credits in English 1 to English 9, which are required English language courses.

The number of credits required for affiliation with a department and for application for the Independent Research Project for a bachelor's degree includes the credits for required English language courses. Students may not achieve eligibility if they are unable to earn the credits for these courses in the recommended quarter for taking those courses. Therefore every student must check and confirm the required number of credits.

Elective English language courses

It is desirable for students to take elective courses in addition to the required English language courses in order to further enhance their competence in the English language and to further deepen their knowledge and understanding of other cultures. Table 13 shows the courses that are offered. (Credits for English language courses that are elective courses cannot be used to substitute for credits in required courses.)

The first and second courses in a sequence of courses are generally held with the same class, so you are urged to take both courses in sequence. The same applies to the third and fourth, the fifth and sixth, the seventh and eighth, the ninth and tenth, and the eleventh and twelfth courses.

Table 13. Elective English language courses

Course level	Course	Number of credits	Quarter when offered
100-level	Oral Expression in English 1 and 2 Oral Expression in English 3 and 4	0-1-0 / 0-1-0 0-1-0 / 0-1-0	1Q / 2Q 3Q / 4Q
	English Presentation Seminar 1 and 2 English Presentation Seminar 3 and 4	0-1-0 / 0-1-0 0-1-0 / 0-1-0	1Q / 2Q 3Q / 4Q
	TOEFL Seminar (Listening and Speaking) 1 and 2 (Listening and Speaking) 3 and 4	0-1-0 / 0-1-0 0-1-0 / 0-1-0	1Q / 2Q 3Q / 4Q
	TOEFL Seminar (Reading and Writing) 1 and 2 (Reading and Writing) 3 and 4	0-1-0 / 0-1-0 0-1-0 / 0-1-0	1Q / 2Q 3Q / 4Q
	TOEIC Seminar 1 and 2 TOEIC Seminar 3 and 4	0-1-0 / 0-1-0 0-1-0 / 0-1-0	1Q / 2Q 3Q / 4Q

	Oral Expression in English GI Oral Expression in English GII	0-2-0 0-2-0	2Q (Summer intensive course) 4Q (Spring intensive course)
	Study Abroad Program in English IA Study Abroad Program in English IIA	0-2-0 0-2-0	2Q (Summer intensive course) 4Q (Spring intensive course)
	Scientific Technical English Study Abroad Practicum Ⅰ	0-2-0	2Q,4Q
200-level	Oral Expression in English 5 and 6 Oral Expression in English 7 and 8	0-1-0 / 0-1-0 0-1-0 / 0-1-0	1Q / 2Q 3Q / 4Q
	English Presentation Seminar 5 and 6 English Presentation Seminar 7 and 8	0-1-0 / 0-1-0 0-1-0 / 0-1-0	1Q / 2Q 3Q / 4Q
	TOEFL Seminar (Listening and Speaking) 5 and 6 (Listening and Speaking) 7 and 8	0-1-0 / 0-1-0 0-1-0 / 0-1-0	1Q / 2Q 3Q / 4Q
	TOEFL Seminar (Reading and Writing) 5 and 6 (Reading and Writing) 7 and 8	0-1-0 / 0-1-0 0-1-0 / 0-1-0	1Q / 2Q 3Q / 4Q
300-level	Oral Expression in English 9 and 10 Oral Expression in English 11 and 12	0-1-0 / 0-1-0 0-1-0 / 0-1-0	1Q / 2Q 3Q / 4Q
	Academic Presentation 9 and 10 Academic Presentation 11 and 12	0-1-0 / 0-1-0 0-1-0 / 0-1-0	1Q / 2Q 3Q / 4Q
	Academic Writing in English 11 Academic Writing in English 12	0-1-0 0-1-0	1Q / 2Q 3Q / 4Q
	TOEFL Seminar (Listening and Speaking) 9 and 10 (Listening and Speaking) 11 and 12	0-1-0 / 0-1-0 0-1-0 / 0-1-0	1Q / 2Q 3Q / 4Q
	TOEFL Seminar (Reading and Writing) 9 and 10 (Reading and Writing) 11 and 12	0-1-0 / 0-1-0 0-1-0 / 0-1-0	1Q / 2Q 3Q / 4Q
	English Speech Seminar 9 and 10 *	0-1-0 / 0-1-0	1Q / 2Q
	Oral Expression in English GIA Oral Expression in English GIIA	0-2-0 0-2-0	2Q (Summer intensive course) 4Q (Spring intensive course)
	Scientific Technical English Study Abroad Practicum Ⅱ	0-2-0	2Q, 4Q

* Course(s) for Developing Creativity

12. Guide to second foreign language courses

Second foreign languages include German, French, Spanish, Russian, and Chinese, which can be taken from the 200-level, and Italian and Korean, which can be taken from the 300-level, for a total of seven languages (to be taken in or after the second year of admission). Courses for Classical Greek and those for Classical Latin are offered as electives, set apart from required elective courses.

Four credits must be attained from restricted elective courses.

All students will first choose one from among the five languages that can be studied from the 200-level. Everyone therefore takes Basic Course 1 (1Q) and Basic Course 2 (2Q) in sequence, receiving 2 credits. The remaining 2 credits can be earned by taking courses in either of the two following ways.

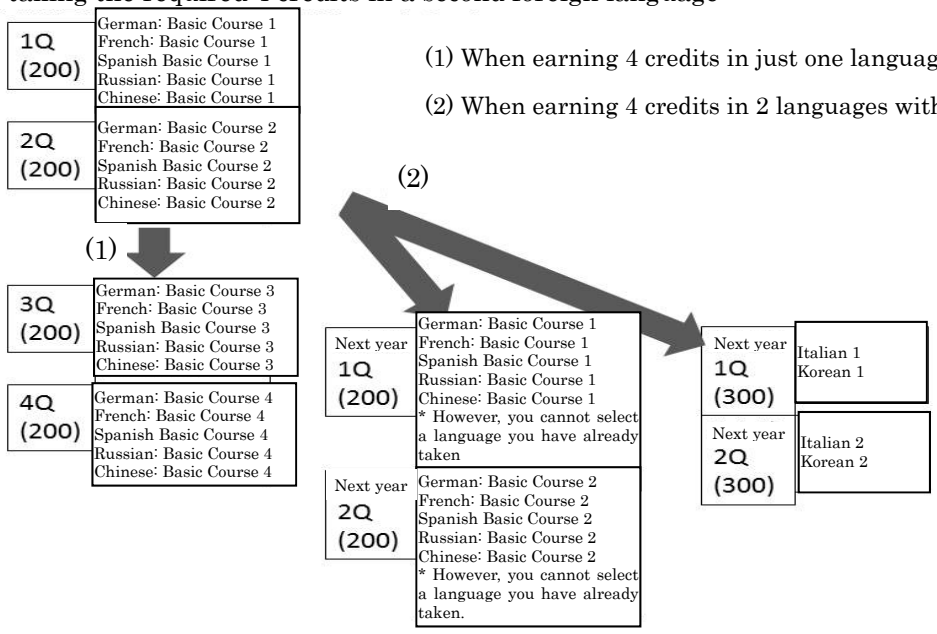
(1) Take one language course sequence from Basic Course 1 to Basic Course 4

After taking Basic Course 1 and Basic Course 2 in a language at the 200-level, students proceed to take Basic Course 3 (3Q) and Basic Course 4 (4Q) in that language at the 200-level. Each course is worth 1 credit, for a total of 4 credits.

(2) Take courses for 2 credits each in two different languages

A language other than the language in which the 200-level Basic Course 1 and Basic Course 2 were taken above can be chosen from among the seven languages designated above, and in the next academic year, the Basic Course 1 (1Q) and Basic Course 2 (2Q) can be taken in sequence to earn the remaining 2 credits.

Method for taking the required 4 credits in a second foreign language



(1) When earning 4 credits in just one language

(2) When earning 4 credits in 2 languages with 2 credits each

Points to note:

- There will be a survey for first-year students, asking their preference for a second foreign language to study. Although students are generally not permitted to change their choice once it is determined after the survey, they may request a change in unavoidable circumstances. The request must be made during the separately designated

period. Faculty members in charge of second foreign language courses will discuss the matter and make decisions on the request.

- If students fail to register for or complete courses they chose, they must retake the course the following academic year or later. Should they take language courses other than those chosen, credits attained may not be counted as part of restricted elective course credits.

Elective courses further include the following courses.

1. Intermediate and advanced levels

Intermediate and advanced courses in German, French, Spanish, Russian, and Chinese are taken at the 300-level. It is desirable for students to take successive courses in 1Q and 2Q, or in 3Q and 4Q, to earn the 2 credits.

2. Conversation (Basic Course) and Conversation (Advanced Course)

Take German, French, Spanish, Russian, or Chinese Conversation (Basic Course) at the 200-level and Conversation (Advanced Course) at the 300-level. It is desirable for students to take successive courses in 1Q and 2Q, or in 3Q and 4Q, to earn the 2 credits.

3. Italian 3 and 4, and Korean 3 and 4

Take these courses at the 300-level. It is desirable for students to take these courses in sequence in 3Q and 4Q to obtain the 2 credits.

4. Classical Greek and Classical Latin

Both Classical Greek and Classical Latin courses are offered at the 300-level. It is recommended that courses are taken consecutively in spring and fall semesters.

5. Study Abroad Program in Second Foreign Languages

The primary objective is to provide students with opportunities to improve their foreign language proficiency, especially in terms of practical communication skills, at universities abroad. In order to enhance learning outcomes, course instructors will offer preparation sessions for students before their departure for study abroad and have them submit a report after they return to Tokyo Tech.

Elective second foreign language courses

Language	Course level	Course		Number of credits	quarter when offered
German	300-level	German Intermediate Course 1 and 2		0−1−0 / 0−1−0	1Q / 2Q
		German Intermediate Course 3 and 4		0−1−0 / 0−1−0	3Q / 4Q
		German: Advanced Course 1 and 2		0−1−0 / 0−1−0	1Q / 2Q
		German: Advanced Course 3 and 4		0−1−0 / 0−1−0	3Q / 4Q
	200-level	German Conversation (Basic Course)	1/2	0−1−0 / 0−1−0	1Q / 2Q
		German Conversation (Basic Course)	3/4	0−1−0 / 0−1−0	3Q / 4Q
	300-level	German Conversation (Advanced Course)	1/2	0−1−0 / 0−1−0	1Q / 2Q
		German Conversation (Advanced Course)	3/4	0−1−0 / 0−1−0	3Q / 4Q
French	300-level	French: Intermediate Course 1 and 2		0−1−0 / 0−1−0	1Q / 2Q
		French: Intermediate Course 3 and 4		0−1−0 / 0−1−0	3Q / 4Q
		French: Advanced Course 1 and 2		0−1−0 / 0−1−0	1Q / 2Q
		French: Advanced Course 3 and 4		0−1−0 / 0−1−0	3Q / 4Q
	200-level	French Conversation (Basic Course)	1/2	0−1−0 / 0−1−0	1Q / 2Q
		French Conversation (Basic Course)	3/4	0−1−0 / 0−1−0	3Q / 4Q
	300-level	French Conversation (Advanced Course)	1/2	0−1−0 / 0−1−0	1Q / 2Q
		French Conversation (Advanced Course)	3/4	0−1−0 / 0−1−0	3Q / 4Q
Spanish	300-level	Spanish : Intermediate Course 1 and 2		0−1−0 / 0−1−0	1Q / 2Q
		Spanish : Intermediate Course 3 and 4		0−1−0 / 0−1−0	3Q / 4Q
		Spanish : Advanced Course 1 and 2		0−1−0 / 0−1−0	1Q / 2Q
		Spanish : Advanced Course 3 and 4		0−1−0 / 0−1−0	3Q / 4Q
	200-level	Spanish Conversation (Basic Course)	1/2	0−1−0 / 0−1−0	1Q / 2Q
		Spanish Conversation (Basic Course)	3/4	0−1−0 / 0−1−0	3Q / 4Q
	300-level	Spanish Conversation (Advanced Course)	1/2	0−1−0 / 0−1−0	1Q / 2Q
		Spanish Conversation (Advanced Course)	3/4	0−1−0 / 0−1−0	3Q / 4Q
Russian	300-level	Russian : Intermediate Course 1 and 2		0−1−0 / 0−1−0	1Q / 2Q
		Russian : Intermediate Course 3 and 4		0−1−0 / 0−1−0	3Q / 4Q
		Russian : Advanced Course 1 and 2		0−1−0 / 0−1−0	1Q / 2Q
		Russian : Advanced Course 3 and 4		0−1−0 / 0−1−0	3Q / 4Q
	200-level	Russian Conversation (Basic Course)	1/2	0−1−0 / 0−1−0	1Q / 2Q
		Russian Conversation (Basic Course)	3/4	0−1−0 / 0−1−0	3Q / 4Q
	300-level	Russian Conversation (Advanced Course)	1/2	0−1−0 / 0−1−0	1Q / 2Q
		Russian Conversation (Advanced Course)	3/4	0−1−0 / 0−1−0	3Q / 4Q
Chinese	300-level	Chinese : Intermediate Course 1 and 2		0−1−0 / 0−1−0	1Q / 2Q
		Chinese : Intermediate Course 3 and 4		0−1−0 / 0−1−0	3Q / 4Q
		Chinese : Advanced Course 1 and 2		0−1−0 / 0−1−0	1Q / 2Q
		Chinese : Advanced Course 3 and 4		0−1−0 / 0−1−0	3Q / 4Q
	200-level	Chinese Conversation (Basic Course)	1/2	0−1−0 / 0−1−0	1Q / 2Q
		Chinese Conversation (Basic Course)	3/4	0−1−0 / 0−1−0	3Q / 4Q
	300-level	Chinese Conversation (Advanced Course)	1/2	0−1−0 / 0−1−0	1Q / 2Q
		Chinese Conversation (Advanced Course)	3/4	0−1−0 / 0−1−0	3Q / 4Q
Italian	300-level	Italian 3/4		0−1−0 / 0−1−0	3Q / 4Q

Korean	300-level	Korean 3/4	0－1－0 / 0－1－0	3Q / 4Q
Classical Greek	300-level	Classical Greek 1/2 Classical Greek 3/4	0－1－0 / 0－1－0 0－1－0 / 0－1－0	1Q / 2Q 3Q / 4Q
Classical Latin	300-level	Classical Latin 1/2 Classical Latin 3/4	0－1－0 / 0－1－0 0－1－0 / 0－1－0	1Q / 2Q 3Q / 4Q
Study Abroad Program in Second Foreign Languages	100-level	Study Abroad Program in Second Foreign Languages 1A Study Abroad Program in Second Foreign Languages 1B	0－2－0 0－2－0	1Q～2Q/ 3Q～4Q 1Q～2Q/ 3Q～4Q

13. Guide to basic science and technology courses

The basic science and technology courses are all 100-level courses (except for some descriptive geometry courses), and they are subdivided into mathematics, physics, chemistry, life sciences, earth and space sciences, descriptive geometry, computing and information science, environmental education, frontiers of science and technology, and creativity development.

Please take careful note that among these courses, there are some in mathematics, physics, chemistry, and life sciences that are required courses for affiliation with the department, for application for the independent research project for a bachelor's degree, and for graduation. These subdivided categories are explained below.

1. Mathematics

Purpose of courses

The purpose is to have students acquire the mathematics that are a foundation for science and engineering, taking into account the mathematics learned through high school. Specifically, in calculus this involves studying partial differentiation and multiple integrals of multivariable functions and fundamentals of analysis; and in linear algebra, studying vectors and matrices and the fundamentals of linear space. These are basic things that all students in science and engineering must know. This content will be essential when taking major courses.

Courses offered

The basic science and technology courses include the following lecture and recitation courses in mathematics.

Course number	Course	Number of credits	Quarter when offered	Remarks
LAS.M101	Calculus I / Recitation	1-1-0	2Q	Required course
LAS.M102	Linear Algebra I / Recitation	1-1-0	1Q	Required course
LAS.M105	Calculus II	2-0-0	3Q, 4Q	
LAS.M107	Calculus Recitation II	0-1-0	3Q, 4Q	
LAS.M106	Linear Algebra II	2-0-0	3Q, 4Q	
LAS.M108	Linear Algebra Recitation II	0-1-0	3Q, 4Q	

Points for attention in taking courses

Students must ensure that they attend classes specified by the unit to which they belong. Students who requested

lectures in English at the time of entering Tokyo Tech should take the classes conducted in English.

It is advisable that Calculus II and Calculus Recitation II are taken together in the same quarter. The same applies to Linear Algebra II and Linear Algebra Recitation II.

Linear Algebra II and Linear Algebra Recitation II are to be taken simultaneously.

Students taking an undergraduate major in Mathematical and Computing Science must take courses for 2 credits or more in Calculus II and Calculus Recitation II and in Linear Algebra II and Linear Algebra Recitation II, since these will be required to apply for the independent research project for a bachelor's degree.

2. Physics

Purpose of courses

Physics is an important discipline for the understanding of nature. It is also a fundamental discipline for taking graduate major courses in science, engineering, and life sciences. The purpose of the lecture courses is for students to acquire the fundamentals of mechanics and electromagnetism as well as the methods and conceptual approaches used in physics. The purpose of the exercise courses is to develop a solid grasp of the lecture content by working out specific problems. The purpose of the experimental courses is to have students acquire the experimental techniques used in physics and to confirm the phenomena of physics through experimentation.

Courses offered

The basic science and technology courses include the following eight courses in physics.

Course number	Course	Number of credits	Quarter when offered	Remarks
LAS.P101	Fundamentals of Mechanics 1	1-0-0	1Q	Required course
LAS.P102	Fundamentals of Mechanics 2	1-0-0	2Q	Required course
LAS.P103	Fundamentals of Electromagnetism 1	1-0-0	3Q	Required course
LAS.P104	Fundamentals of Electromagnetism 2	1-0-0	4Q	Required course
LAS.P105	Exercises in Physics I	0-1-0	1Q–2Q	
LAS.P106	Exercises in Physics II	0-1-0	3Q-4Q	
LAS.P107	Experiments in Physics I	0-0-1	1Q, 2Q	
LAS.P108	Experiments in Physics II	0-0-1	3Q, 4Q	

Points for attention in taking courses

Exercises in Physics I and Experiments in Physics I and Exercises in Physics II and Experiments in Physics II are held in alternating weeks. Explanations of how the exercise and experiment courses are held will be given in the first session of either course, so students wishing to take these courses should make sure to attend the first sessions.

Exercises in Physics I runs in 1Q and 2Q consecutively and requires students to attend both 1Q and 2Q classes in the same academic year to attain 1 credit. This is the same as for Exercises in Physics II, which runs in 3Q and 4Q consecutively. Students must attend both 3Q and 4Q classes in the same academic year to attain 1 credit.

There may be cases where the number of Experiments in Physics I enrollees and those in Experiments in Physics II is limited. If the number of applicants exceeds the number of spots available, enrollees will be selected by screening with priority given to students planning to study at the Department of Physics and those wishing to become a teacher.

3. Chemistry

Purpose of courses

The purpose of the lecture courses is to provide fundamental study of the structure, functions, reactions, and other such aspects of matter on the basis of the properties of atoms and molecules so that students can learn the theories and conceptual approaches used in chemistry. In the laboratory courses, students acquire the basics needed for experimentation, including the knowledge and skills for working with chemicals and laboratory equipment. In addition, students will more deeply understand the content of chemistry lectures through exercises and hands-on experience. In addition to students intending to study at the Department of Chemistry or Department of Chemical Science and Engineering, other students will benefit from lectures and experiments in chemistry courses, which will provide them with basic knowledge and information on materials and substances.

Courses offered

The chemistry courses included in the basic science and technology courses are made up of four lecture courses and two laboratory courses as shown below.

The lecture courses are all required courses.

Course number	Course	Number of credits	Quarter when offered	Remarks
LAS.C101	Basic Inorganic Chemistry	1-0-0	1Q, 2Q	Required course
LAS.C103	Basic Organic Chemistry	1-0-0	1Q, 2Q	Required course
LAS.C105	Basic Quantum Chemistry	1-0-0	3Q, 4Q	Required course
LAS.C107	Basic Chemical Thermodynamics	1-0-0	3Q, 4Q	Required course
LAS.C110	Chemistry Laboratory I	0-0.5-1.5	1Q–2Q	
LAS.C112	Chemistry Laboratory II	0-0.5-1.5	3Q-4Q	

The lecture courses cover the following material.

Basic Inorganic Chemistry: The structure of atoms, the structure, bonds, and physical properties of inorganic compounds, acids and bases, oxidation and reduction, etc.

Basic Organic Chemistry: Bonds, structure, and physical properties of organic compounds, types and characteristics of organic chemical reactions, etc.

Basic Quantum Chemistry: Atoms and electrons as understood in quantum chemistry, hydrogen atoms, chemical bonding, the structure of molecules, etc.

Basic Chemical Thermodynamics: First and second laws of thermodynamics, enthalpy, Gibbs energy, etc.

Students will perform laboratory work on the following themes in the laboratory courses.

Chemistry Laboratory I: Synthesizing methyl orange, standard electrode potential, molecular modeling, etc.

Chemistry Laboratory II: Absorption spectra, reaction rate constants, and chemistry of flavonoids, etc.

Each theme will be pursued by conducting exercises related to the specific laboratory work, doing laboratory work, and presenting reports, in that order.

Points for attention in taking courses

Lectures conducted in Japanese take place in four classes that are held in the same class period, so you should check your unit number and make sure you are attending the designated class.

While it is advisable that students take Chemistry Laboratory II after completing Chemistry Laboratory I, it may be possible to take Chemistry Laboratory II only. When there are more applicants than can be accommodated in laboratories, a lottery will be used to determine which students are admitted.

4. Life sciences

Purpose of courses

Students will acquire basic knowledge in the life sciences, a subject that is considered necessary today in all science and engineering fields. This is not just about what is essential for studies in Life Science and Technology. Rather, these courses provide a foundation for interdisciplinary human resource development across a wide range of science and engineering fields. Gaining an understanding of the mechanisms of life is important in terms of living as a responsible member of society, as well.

Courses offered

The basic science and technology courses include the following five courses in life sciences.

Course number	Course	Number of credits	Quarter when offered	Remarks
LAS.B101	Fundamental Life Science 1-1	1-0-0	1Q	Required course
LAS.B102	Fundamental Life Science 1-2	1-0-0	2Q	Required course
LAS.B103	Fundamental Life Science 2-1	1-0-0	3Q	
LAS.B104	Fundamental Life Science 2-2	1-0-0	4Q	
LAS.B105	Fundamental Life Science Laboratory	0-0-1	3Q-4Q	

Points for attention in taking courses

Students are divided into eight classes (conducted in Japanese) and one class (conducted in English) with students from all Schools mixed together. All the classes cover the same content. Students should check their unit number and make sure they are attending the designated class. Students who requested lectures in English at the time of admission should take the classes that are conducted in English. Students who requested lectures in Japanese at the time of admission will not be able to switch partway through to attend classes that are conducted in English. There are 7.5 lectures per quarter.

Fundamental Life Science 1-1 (1Q) and Fundamental Life Science 1-2 (2Q) are required courses for all Schools. As a rule, earning credit in these first two courses is a requirement for taking subsequent lecture and laboratory courses in Fundamental Life Science.

The Fundamental Life Science Laboratory course is conducted in a practical training room located on the 5th floor of Ookayama West Bldg. 3. The course runs in 3Q and 4Q consecutively and consists of a total of seven class sessions involving experiments. Students must take both 3Q and 4Q classes in the same academic year. Participants are divided into four groups, and the groups meet in alternating weeks to do laboratory work. You will need to check in advance to find out to which group you belong. The upper limit on enrollment is 240 students (60 students per class). If the number of students wishing to take the course exceeds this limit, then students in the School of Life Science and Technology (approximately 150 students) will be given priority to register for the course.

5. Earth and space sciences

Purpose of courses

The earth and space sciences are essential for forming a scientific view of the earth, space, and nature. These sciences make up one of the basic fields that students at science and technology universities should study. This is also an interdisciplinary field of study that covers such wide-ranging fields as mathematics, physics, astronomy, geoscience, chemistry, biology, computing and information science, and environmental studies. The earth and space sciences courses are made up of two lecture courses and three laboratory courses. Lectures of Earth and Space Sciences A mainly cover the evolution of galaxies, planets, and the solar system, and those of Earth and Space Sciences B cover physics and mechanics of galaxies, planets, and the solar system. Laboratory courses include Earth and Space Sciences, Laboratory and Field Studies (Geophysics), in which students carry out laboratory work indoors and on the campus; Earth and Space Sciences, Laboratory and Field Studies (Earth Materials), in which students go on outdoor field excursions and carry out exercises; and Earth and Space Sciences, Laboratory and Field Studies (Astronomy), in which students carry out astronomical observations. The aim of these classes is to have students learn present-day views of space and the earth as well as the conceptual approaches that form their context. At the same time, they also acquire a broader scholarly perspective in a variety of different fields.

Courses offered

The basic science and technology courses include the following five courses in earth and space sciences.

Course number	Course	Number of credits	Quarter when offered
LAS.A101	Earth and Space Sciences A	2-0-0	1Q
LAS.A102	Earth and Space Sciences B	2-0-0	3Q
LAS.A110	Earth and Space Sciences, Laboratory and Field Studies (Geophysics)	0-0-1	2Q
LAS.A111	Earth and Space Sciences, Laboratory and Field Studies (Earth Materials)	0-0-1	2Q
LAS.A112	Earth and Space Sciences, Laboratory and Field Studies (Astronomy)	0-1-0	3Q

Points for attention in taking courses

Students wishing to take Earth and Space Sciences, Laboratory and Field Studies courses should be sure to attend the guidance sessions that are held before the courses begin.

6. Descriptive geometry

Purpose of courses

1. The significance of studying descriptive geometry

Descriptive geometry is a systematic structure that makes it possible to grasp the character of a geometrical figure as an object within a spatial relationship without using calculations or formulas. It is a set of common rules transcending historical times and regions as a technique for representing three-dimensional objects that have size and shape, such as machines, electrical products, furniture, buildings, and so on, as two-dimensional drawings. With a long history, descriptive geometry was also an irreplaceable technology used in building fortifications and designing weapons. In the present era, the technologies for computer-aided design (CAD) and computer graphics (CG) were developed using the systematic structure of descriptive geometry. Descriptive geometry is also essential for understanding, and designing, the structure and performance of molecules in nanotechnology and other such fields. Knowledge of descriptive geometry is therefore absolutely essential in carrying out *monozukuri* (high-quality manufacturing) through the cooperation of specialists in a number of different fields. It is a discipline geared to practical achievements that are widely sought by students in science and engineering.

2. Courses in descriptive geometry

・Descriptive Geometry for Space Design and Descriptive Geometry and Drawing (recommended for the School of Environment and Society in particular)

Descriptive Geometry for Space Design is a course that has lectures for learning about principles and exercises for deepening understanding. In Descriptive Geometry and Drawing, students learn to use their knowledge to resolve problems while creating elegant drawings.* For students with an undergraduate major in Architecture and Building Engineering, credits from these courses are essential for pursuing their independent research project.

Courses offered

The basic science and technology courses include the following seven courses in descriptive geometry.

Course number	Course	Number of credits	Quarter when offered
LAS.D103	Descriptive Geometry & Computer Graphics 1	0.5-0.5-0	3Q
LAS.D104	Descriptive Geometry & Computer Graphics 2	0.5-0.5-0	4Q
LAS.D111	Descriptive Geometry for Space Design 1	1-1-0	1Q–2Q
LAS.D112	Descriptive Geometry for Space Design 2	1-1-0	3Q–4Q
LAS.D113	Descriptive Geometry and Drawing	0-0-1	1Q–4Q

Points for attention in taking courses

Students with an undergraduate major in Architecture and Building Engineering must earn a total of five credits in Descriptive Geometry for Space Design 1 and 2 and Descriptive Geometry and Drawing, since this is necessary in order to apply for the independent research project for a bachelor's degree.

7. Computing and information science

Purpose of courses

Proper understanding and knowledge of computing and information science and the ability to make use of them are necessities for the people of today. In addition to conveying this kind of general content that everyone needs, the purpose of the computing and information science courses is to provide students in science and engineering, and Tokyo Tech students in particular, with the knowledge and skills in computing and information science that are necessary in pursuing their studies and research, and with the proper scientific understanding of computing and information science and of computers. Specifically, Information Literacy here involves learning the use of all types of information provided at Tokyo Tech, the processing of data, the writing of scientific and technical papers, giving presentations, information ethics, and so on. In the Computer Science courses, we first learn how to make computers do what we want them to do, expressed in the form of computation, and then learn about algorithms, computational quantity, numerical computation, simulation, and so on, interspersed with programming exercises.

Courses offered

The basic science and technology courses include the following four computing and information science courses. All of these courses meet once (for 100 minutes) per week.

Course number	Course	Number of credits	Quarter when offered
LAS.I111	Information Literacy I	0.5-0.5-0	1Q
LAS.I112	Information Literacy II	0.5-0.5-0	2Q
LAS.I121	Computer Science I	0.5-0.5-0	3Q
LAS.I122	Computer Science II	0.5-0.5-0	4Q

Points for attention in taking courses

- All newly admitted students should be sure to attend the first class of Information Literacy I.
- Please bring your student ID card and a letter notifying your password when attending classes. They are required to participate in practical exercises and training.
- Please check the syllabus so you will know the prerequisites for taking the course.
- In the undergraduate major in Mathematical and Computing Science and the undergraduate major in Computer Science, students are required to have earned a certain number of credits in computing and information science courses in order to submit the Application for Independent Research Project for a bachelor's degree. For details, please see the explanation for the relevant study program.

8. Environmental education

Purpose of courses

The purpose of the environmental education courses is to provide the **foundation in environmental education** to produce scientists and engineers who are capable of thinking about the **sustainable society** that is being sought as a way for the earth and humankind to coexist. Another purpose is **to increase awareness of safety on campus.**

Courses offered

The basic science and technology courses include one course in environmental education, as follows.

Course number	Course	Number of credits	Quarter when offered
LAS.E101	Environment and Safety	1-0-0	1Q, 2Q

Points for attention in taking courses

Among environmental education courses, the only course available at the 100-level is Environment and Safety. Environment and Safety A and B are offered in both 1Q and 2Q. It is recommended that students take this course as early in their enrollment as possible to be fully prepared for starting laboratory work.

9. Frontiers of science and technology

The supervising faculty for the School of Science, School of Engineering, School of Materials and Chemical Technology, School of Computing, School of Life Science and Technology, and School of Environment and Society invite internationally prominent scientists and engineers to give lectures so that students can see for themselves the conceptual approaches taken by such individuals when dealing with issues. This gives students something to consider regarding their own individual approaches to study at Tokyo Tech. This is the only course at Tokyo Tech that provides an overview of the leading-edge science and technology studied at each School. It will help new students find which fields of study fit their academic interests and identify majors they wish to pursue. Students will also learn the basics of ethics in science and engineering.

This course is held in the Tokyo Tech Lecture Theatre.

Repeating this course is not permitted.

Students, divided into four groups, attend all the lectures arranged by each School in turn.

Courses offered

The basic science and technology courses include one Frontiers of Science and Technology course.

Course number	Course	Number of credits	Quarter when offered
LAS.F101	Frontiers of Science and Technology	1-0-0	1Q

10. Creativity development

Purpose of courses

The scientists and engineers of the future will need to have the creative ability to produce new things, technologies, and ideas. This will require students to grapple with the lectures proactively and independently, so as to make it possible to foster creativity through perception, discovery, and resolution of problems. The creativity development courses are lecture courses for the purpose of nurturing this kind of creativity.

There are also other creativity development courses, separate from the above, that are offered by undergraduate majors, and so on. Details can be found in item 24 (Guide to creativity development courses; see p. 195).

Courses offered

The basic science and technology courses include one creativity development course as follows.

Course number	Course	Number of credits	Quarter when offered
LAS.R101	Mono-Tsukuri (Craft and Design)	1-0-1	2Q

Points for attention in taking courses

Applicants for this lecture course are recruited in the preceding semester at the Collaboration Center for Design and Manufacturing. In the lectures, each group of three to five students builds a Stirling engine and a tachometer. At the end of the lectures, each group gives a presentation on the items it has created. Since working as a team is required, students are expected to attend all classes without fail, in principle.

14. Guide to breadth courses

Wellness courses

Wellness is a comprehensive concept. It refers to the conceptual approach of preventive medicine with regard to factors such as exercise, diet, sleep, and human relationships. It also encompasses the attitudes and behavior for actively and creatively pursuing living habits and environment, for example by creating a better self, making friends, creating your own living space, and so on. We are expected to think not just of ourselves, but also to show consideration for others and for our surroundings. This kind of awareness of cooperative living and understanding of synergistic effects is also a part of the broad-ranging perspective and insight that is expected of us. No matter the excellence of the qualifications and talents we achieve, we cannot realistically play an active part in real society without good physical health. We will also be unable to accomplish superior work if we are not psychologically stable. Tokyo Tech students are expected to become the leaders of the future, and so you are called on to be thoughtful and show consideration not only for your own wellness but also for the wellness of others.

In wellness courses, students learn the conceptual approach of preventive medicine and the mechanisms involved. By means of exercise and practical work, they engage in practical learning of how to make use of that knowledge, the measures to employ, and the attitudes and behavior for pursuing wellness. University is the last opportunity people have to take courses that are directly useful in putting wellness into practice. The life of a working adult is also taken into consideration, and we urge students to take an active part in this course in order to develop the creative wellness attitudes and behavior while still living as students.

The wellness courses are made up of elective courses from the 100-level to the 300-level (lectures, exercises, and practical work). Students in their second year and above are allowed to take any wellness courses. This allows students to set up flexible plans for taking courses according to their own situation.

For the practical work, students can make their own independent choice of exercise or sports categories in their course. Although the courses differ in their aims, everybody can take courses according to their own objectives, regardless of whether they like physical activity or not, for example by searching for categories they like, polishing their own skills in categories that are their specialties, taking on the challenge of a category they have never experienced, reevaluating courses they felt weak in, using exercise and sports to make friends, or to create a place for themselves, and so on.

- 100-level: (1) Health Science; (2) Laboratory of Health Science; (3) Wellness Exercise; (4) Advanced Wellness Exercise
- 200-level: (5) Advanced Sports Exercise
- 300-level: (6) Total Wellness Exercise

Purpose and aims of wellness courses

The purpose of these courses is to give students a deeper understanding of healthful living, exercise, sports, and so on, and also to develop capable people who pursue active, creative lifestyles, and who have broad perspectives and knowledge, to include awareness of coexistence with others and understanding of synergistic effects.

(1) The aim of the Health Science course is to teach students scientific findings on life and health together with

methods for maintaining and improving health, and to give students a grounding in management of their own health that will last a lifetime.

(2) In the Laboratory of Health Science, the aim is to have students learn the fundamentals of anthropometry as related to physiology and biomechanics, taking themselves as the principal object of study. They also deepen their understanding of the changes in body and mind (in measurement and in observation) brought about by exercise.

(3) The aim of Wellness Exercise is a practical understanding of health management. Students therefore form exercise habits, research physical activities that can be enjoyed over the long term, heighten their motor skills and communication ability, and so on.

(4) The aim in Advanced Wellness Exercise is to develop the bodily accomplishments of capable people in global roles, to maintain and increase self-esteem, and so on.

(5) In Advanced Sports Exercise, the aim is to develop the resilience of body and mind needed by capable people in global roles, to cultivate fairness, to develop fighting spirit, and so on.

(6) The aim of the Total Wellness Exercise course is to develop capable people in global roles to function as project leaders, to accumulate the direct experience that can vitalize individuals, groups and organizations, and so on.

Wellness course credits

Students can take courses for a maximum of six credits from among the wellness courses. It is preferable to take these courses in order from 100-level to 200-level and then to 300-level if at all possible, but it is not required that you take courses in sequence. The quarters in which the courses are offered are as follows.

Quarter when offered	Course name	Quarter when offered	Course name
1Q, 2Q, 3Q, 4Q	Wellness Exercise	1Q, 2Q	Health Science
3Q, 4Q	Laboratory of Health Science	3Q, 4Q	Advanced Wellness Exercise
1Q, 2Q, 3Q, 4Q	Advanced Sports Exercise	1Q, 2Q, 3Q, 4Q	Total Wellness Exercise

Points for attention in taking wellness courses

・Lecture and exercise

1) Health Science meets once per week in one quarter and students can earn 1 credit.

2) Laboratory of Health Science meets once per week in one quarter and students can earn 1 credit.

・Exercise courses

1) Classes meet only once per week in a quarter, amounting to only 0.5 credits, which means that 1 credit will not be awarded. Another course for 0.5 credits should be completed in the same academic year to count 1 credit in your GAP calculation.

2) Therefore, we basically recommend that you take the course in two successive quarters, i.e., 1Q and 2Q (spring semester) or 3Q and 4Q (fall semester), going to the class once per week, and so earning 1 credit. It is also possible to take the exercise unit of a course with the same name that meets in a different class period in the same quarter, going to two classes per week, and so earning 1 credit.

3) Students wishing to attend classes in different semesters to attain 1 credit must consult instructors before registering for courses.

4) In order to take these courses, students must have had a medical examination at the time of admission.

5) There are intensive classes held off campus apart from the exercises held on campus. For intensive courses, students can earn 1 credit for one category of class attended.

6) If health reasons make students unable or unfit to exercise while taking a course, special consideration will be required, so students should consult with the instructor.

7) The exercise and sports categories offered are shown in the wellness course syllabus and website.
(Badminton, tennis, table tennis, soccer, physical training, basketball, golf, skiing, etc. are scheduled)

List of wellness courses

Course	Format	Course	Number of credits	Class configuration	Quarter offered
Wellness Courses	Exercise	Wellness Exercise	0-0-1	Basic configuration is one class per week in the 2:00 class period for 14 weeks	1Q, 2Q, 3Q, 4Q
		Advanced Wellness Exercise	0-0-1	Basic configuration is one class per week in the 2:00 class period for 14 weeks	3Q, 4Q
		Advanced Sports Exercise	0-0-1	Basic configuration is one class per week in the 2:00 class period for 14 weeks	1Q, 2Q, 3Q, 4Q
		Total Wellness Exercise	0-0-1	Basic configuration is one class per week in the 2:00 class period for 14 weeks	1Q, 2Q, 3Q, 4Q
	Lecture	Health Science	0-1-0	One class per week in the 2:00 class period for seven weeks	1Q, 2Q
	Laboratory	Laboratory of Health Science	1-0-0	One class per week in the 2:00 class period for seven weeks	3Q, 4Q

Global awareness and other breadth courses

The aim of Tokyo Tech is to develop human resources that will, in the future, be able to contribute to the world through the power of science and technology, and we therefore strongly recommend that all students study abroad or acquire international experience by the time they complete a Master's Degree program. We want you to become able, through Study Abroad and international experience, to develop international perspectives, to understand diversity, and to take steps to communicate with people who have different customs or ways of thinking.

Global Awareness and other breadth courses are common courses for all the schools, and the following courses are offered for Bachelor's Degree programs (from 100-level to 300-level). The courses include training in other countries, practical lectures given by foreign instructors, cooperative lectures with students, and so on, and also include numerous courses conducted in English. The Global Scientists and Engineers Courses (GSEC) are also included. The 100-level GSEC course fosters the ability to think in a multifaceted manner from international perspectives and the motivation to engage in global activity. The 300-level GSEC course is conducted by groupwork and other such means to foster understanding of different cultures, develop skills in communication and the ability to identify issues, and also to cultivate practical skills by Study Abroad in the later years at university.

For details, please see the syllabus and other such sources.

Course level	Course name	Credits	Quarter when offered	Remarks
100	Introductory Course for Global Scientists and Engineers	1-1-0	2Q, 3Q, 4Q	GSEC courses
100	Overseas Training for Global Scientists and Engineers Basic 1A	0-0-1	2Q	GSEC courses
100	Overseas Training for Global Scientists and Engineers Basic 1B	0-0-1	4Q	GSEC courses
100	Overseas Training for Global Scientists and Engineers Basic 1C	0-0-1	1Q-2Q	GSEC courses
100	Overseas Training for Global Scientists and Engineers Basic 1D	0-0-1	3Q-4Q	GSEC courses
100	Overseas Training for Global Scientists and Engineers Basic 2A	0-0-2	2Q	GSEC courses
100	Overseas Training for Global Scientists and Engineers Basic 2B	0-0-2	4Q	GSEC courses
100	Overseas Training for Global Scientists and Engineers Basic 2C	0-0-2	1Q-2Q	GSEC courses
100	Overseas Training for Global Scientists and Engineers Basic 2D	0-0-2	3Q-4Q	GSEC courses

Course level	Course name	Credits	Quarter when offered	Remarks
100	Overseas Training for Global Scientists and Engineers Basic 3C	0-0-3	1Q-2Q	GSEC courses
100	Overseas Training for Global Scientists and Engineers Basic 3D	0-0-3	3Q-4Q	GSEC courses
100	Introduction to Society and Technology	1-0-0	3Q	
100	Overseas Training for Global Scientists and Engineers Basic 4C	0-0-4	1Q-2Q	GSEC courses
100	Overseas Training for Global Scientists and Engineers Basic 4D	0-0-4	3Q-4Q	GSEC courses
100	Remote learning program for international communication in Asia - Basic Course (Tokyo Tech-AYSEAS)	0-0-1	1Q-2Q	GSEC courses
100	Study Abroad program for international communication in Asia - Basic Course (Tokyo Tech-AYSEAS)	0-0-2	3Q-4Q	GSEC courses
100	Domestic Training for Global Scientists and Engineers Basic 1A	0-0-1	2Q	GSEC courses
100	Domestic Training for Global Scientists and Engineers Basic 1B	0-0-1	2Q	GSEC courses
200	Advanced Course for Global Scientists and Engineers	1-1-0	3Q, 3Q to 4Q	GSEC courses
200	Cultivating the Power of Execution through the Game of Go	1-1-0	3Q-4Q	GSEC courses
200	Introduction to Management of Technology I	1-0-0	1Q	
200	Introduction to Management of Technology II	1-0-0	2Q	
200	Introduction to Management of Technology III	0.5-0.5-0	3Q-4Q	
200	Introduction to Management of Technology IV	0.5-0.5-0	3Q-4Q	
300	Overseas Training for Global Scientists and Engineers Basic 1A	0-0-1	2Q	GSEC courses
300	Overseas Training for Global Scientists and Engineers Basic 1B	0-0-1	4Q	GSEC courses

Course level	Course name	Credits	Quarter when offered	Remarks
300	Overseas Training for Global Scientists and Engineers Basic 1C	0-0-1	1Q-2Q	GSEC courses
300	Overseas Training for Global Scientists and Engineers Basic 1D	0-0-1	3Q-4Q	GSEC courses
300	Overseas Training for Global Scientists and Engineers Basic 2A	0-0-2	2Q	GSEC courses
300	Overseas Training for Global Scientists and Engineers Basic 2B	0-0-2	4Q	GSEC courses
300	Overseas Training for Global Scientists and Engineers Basic 2C	0-0-2	1Q-2Q	GSEC courses
300	Overseas Training for Global Scientists and Engineers Basic 2D	0-0-2	3Q-4Q	GSEC courses
300	Overseas Training for Global Scientists and Engineers Basic 3C	0-0-3	1Q-2Q	GSEC courses
300	Overseas Training for Global Scientists and Engineers Basic 3D	0-0-3	3Q-4Q	GSEC courses
300	Study Abroad program for international communication in Asia (Tokyo Tech-AYSEAS)	0-0-2	2Q	GSEC courses
300	Editorial Designing in the Media	0-2-0	3Q-4Q	GSEC courses
300	Science & Engineering Design for Global Talents - Overseas Programme	1-1-0	2Q	GSEC courses
300	Advanced Technology in Emerging Fields: Environment & Energy 1	1-0-0	2Q	GSEC courses
300	Advanced Technology in Emerging Fields: Environment & Energy 2	1-0-0	2Q	
300	Environment & Energy	3-0-0	2Q	
300	The Age of Ethical Crisis for Professional Scientists	1-0-0	2Q	
300	Communicating Science and Engineering in Society	0-1-0	4Q	GSEC courses
300	Topics on Japan I	1-0-0	3Q	*GSEC courses

Course level	Course name	Credits	Quarter when offered	Remarks
300	Topics on Japan II	1-0-0	1Q	GSEC courses
300	Overseas Training for Global Scientists and Engineers Basic 4C	0-0-4	1Q-2Q	GSEC courses
300	Overseas Training for Global Scientists and Engineers Basic 4D	0-0-4	3Q-4Q	GSEC courses
300	Advanced Technology in Emerging Fields 3: Earth Life & Science	1-0-0	2Q	
300	Advanced Technology in Emerging Fields 4: Advanced Materials Science & Engineering	1-0-0	2Q	
300	Traditional Technology and Intercultural Co-learning	0.5-0-0.5	3Q	GSEC courses
300	YSEP Research Project	0-0-4	1Q-2Q 3Q-4Q	GSEC courses
300	Domestic Training for Global Scientists and Engineers 1C	0-0-1	1Q-2Q	GSEC courses
300	Domestic Training for Global Scientists and Engineers 1D	0-0-1	3Q-4Q	GSEC courses
300	Methodology of Transdisciplinary Research (Global)	0.5-0.5-0	4Q	GSEC courses
300	Bringing Ideas in Remote Discussion	0-1-0	4Q	GSEC courses
300	Co-learning for Global Scientists and Engineers 1	1-1-0	3Q	GSEC courses
300	Co-learning for Global Scientists and Engineers 2	1-1-0	4Q	GSEC courses
300	Domestic Training for Global Scientists and Engineers 1A	0-0-1	2Q	GSEC courses
300	Domestic Training for Global Scientists and Engineers 1B	0-0-1	4Q	GSEC courses
300	Remote learning program for international communication in Asia (Tokyo Tech-AYSEAS)	0-0-1	2Q	GSEC courses

Course(s) marked with an asterisk (*) in the “Remarks” column are Course(s) for Developing Creativity.

15. Guide to courses for students on Study Abroad programs

The following courses are offered to international exchange students as Japanese language and culture courses. Within the limits stated in items (1) to (3) below, the credits earned here can be included in the number of credits required to apply for the independent research project for a bachelor's degree and to satisfy graduation requirements. However, this applies to only one of either item (2) or (3).

(1) Humanities and social science courses (excluding Tokyo Tech Visionary Project, Liberal Arts Final Report, and 300-level courses): up to 7 credits

(2) English language courses (excluding English 9): up to 8 credits

(3) Second foreign language courses: up to 4 credits

However, the maximum number of transfer credits allowed is a total of 12 credits in (1), (2), and (3) combined.

Japanese language and culture courses

Course level	Course	Number of credits	Quarter when offered
100	Japanese 1	0-1-0	1Q
100	Japanese 2	0-1-0	2Q
100	Japanese 3	0-1-0	3Q
100	Japanese 4	0-1-0	4Q
200	Japanese 5	0-1-0	1Q
200	Japanese 6	0-1-0	2Q
200	Japanese 7	0-1-0	3Q
200	Japanese 8	0-1-0	4Q
100	Japanese Culture: Adaptation	0-1-0	1Q
200	Japanese Culture: Japanology	0-1-0	2Q
300	Japanese Culture: Language and literature	0-1-0	3Q
300	Japanese Culture: Language and society	0-1-0	4Q

16. Guide to First-Year Courses

Creative process courses

Creative process courses

These are courses that form a complete whole together with Frontiers of science and technology courses. Laboratory work, practical exercises, practical problem solving, discussion, group exercises, and other such methods that make good use of the distinctive characteristics of each School are implemented. In this way, students are given a direct experience of the movements in science and technology that are at the foundation of the specialized field of each School, with the aim of having students acquire the stance of independent learning with a goal in mind for their studies at Tokyo Tech.

Courses offered

Creative process courses are offered for each School, as shown below.

Course	Number of credits	Quarter when offered
Processes for creation in science and technology【School of Science】	1-0-0	2Q
Processes for creation in science and technology【School of Engineering】	1-0-0	2Q
Processes for creation in science and technology【School of Materials and Chemical Technology】	0.5-0.5-0	2Q
Processes for creation in science and technology【School of Computing】	1-0-0	2Q
Processes for creation in science and technology【School of Life Science and Technology】	1-0-0	2Q
Processes for creation in science and technology【School of Environment and Society】	1-0-0	2Q

Processes for creation in science and technology【School of Science】　1-0-0　2Q

This lecture course is held following the initial School of Science Student Exchange session, with the remaining six sessions divided into two rounds and the students divided into groups by the four undergraduate majors. These comprise the Mathematics undergraduate major, Physics undergraduate major, Chemistry undergraduate major, and Earth and Planetary Sciences undergraduate major in the School of Science. Lectures, seminars, and other such events provide hands-on experience for the undergraduate majors in these smaller groups. Value is placed on students thinking for themselves and engaging in dialogue and discussion with instructors and each other. These sessions are also opportunities to think about what it means to do scholarship, and they additionally provide chances for students to think about their future career paths.

Processes for creation in science and technology【School of Engineering】 0.5-0.5-0 2Q

When trying to bring about innovation in science and technology in response to the needs of society, we must:

- take a multi-disciplinary approach, beyond individual disciplines such as electrical engineering or mechanical engineering
- ensure that academic integrity and ethics required of researchers and engineers are maintained in research and development activities
- be aware of the importance of strategic management of intellectual property to protect and utilize research achievements

Lectures in this course will give students an overview of ongoing cutting-edge projects jointly conducted by five departments of the School of Engineering., i.e., Departments of Mechanical Engineering, Systems and Control Engineering, Electrical and Electronic Engineering, Information and Communications Engineering, and Industrial Engineering and Economics. Lecture topics also include intellectual property and research and engineering ethics.

Processes for creation in science and technology【School of Materials and Chemical Technology】1-0-0 2Q

In this lecture course, students are divided into a number of teams, and they gain an understanding of how materials are used in the things around them by going through the process of dismantling those things themselves. Instructors who are experts in the various materials fields then explain the physical characteristics of the materials used and the mechanisms of their functional expressions.

Students work together in small teams to tackle tasks assigned by instructors. They discuss and exchange views on the task with other team members and instructors, and may need to seek advice from faculty members other than instructors to conduct necessary research and study. The results and achievements must be reported/submitted.

Processes for creation in science and technology【School of Computing】1-0-0 2Q

Students will learn, based on various examples, how mathematics, computing, and computer science contribute to the advancement of our information society.

This course aims to help students understand that the specialized knowledge they will acquire from undergraduate and graduate studies as well as knowledge in other science, engineering, and social science fields relates to the real world in various ways, and broaden their perspective and interest in computing.

Processes for creation in science and technology【School of Life Science and Technology】1-0-0 2Q

This course examines green fluorescent protein (GFP). The mechanism of GFP emitting light is studied in terms of physical chemistry, organic chemistry, biochemistry, and so on, to reach an understanding of how structure creates function. The aim is to have students themselves do hands-on work with molecular models, computers, and other similar means in order to develop an intuitive understanding of gene expression (the central dogma), the three-dimensional structure and folding arrangement of proteins, the mechanism by which chromophores fluoresce, the technology for fluorescence imaging, and so on.

Processes for creation in science and technology【School of Environment and Society】1-0-0 2Q

This course deals with *monozukuri* (high-quality manufacturing) related to undergraduate majors in Architecture

and Building Engineering, Civil and Environmental Engineering, and Transdisciplinary Science and Engineering. It includes exercises for learning the processes involved (planning, design, execution, fabrication, maintenance, and operation).

First-Year Courses

First-Year Courses

These are major courses in the first year of admission that are related to the specialized fields that students aim to study in the years ahead. The purpose is to allow students to gradually absorb the content for the related specialization, deepen their understanding of the specialized field, and enable a smooth continuation of the specialized education provided in the undergraduate major chosen from the second year on.

Courses offered

First-Year Courses are offered for each school, as follows.

< School of Science >

Course	Number of credits	Quarter when offered
School of Science Literacy	1-0-0	1Q
School of Science Basic Science	2-0-0	3Q～4Q

First-Year Courses in the School of Science — purpose, overview, etc.

The main purpose of the School of Science Literacy course is to introduce the teaching and research content of the Mathematics undergraduate major, Physics undergraduate major, Chemistry undergraduate major, and Earth and Planetary Sciences undergraduate major in the School of Science. After newly admitted students take this course, it would be desirable for them to also take processes for creation in science and technology 【School of Science】, which is a course of similar intent, in the second quarter. In School of Science Basic Science (offered in 3Q and 4Q consecutively), instructors from four departments at the School of Science provide introductory lectures about their fields of study.

< School of Engineering >

Course	Number of credits	Quarter when offered
Engineering Literacy I	0.5-0.5-0	1Q
Engineering Literacy II	0.5-0.5-0	2Q
Engineering Literacy Ⅲ	0.5-0.5-0	3Q
Engineering Literacy Ⅳ	0.5-0.5-0	4Q

First-Year Courses in the School of Engineering — purpose, overview, etc.

There are seven different engineering topics chosen for students' practical exercises or group work. We hope experience in Engineering Literacy will motivate students to proactively pursue studies from their second year onward.

Notes:

1. Engineering Literacy is limited to new students at the School of Engineering. Repeating the course is not permitted.
2. Students of the School of Engineering must take courses designated for groups to which they are assigned. For example, a student belonging to group “a” must take Engineering Literacy Ia, IIa, IIIa, and IVa.

< School of Materials and Chemical Technology >

Course	Number of credits	Quarter when offered
Materials and Chemical Engineering Literacy	0.5-0.5-0	1Q
Introduction of Materials and Chemical Engineering A	1-0-0	2Q
Introduction of Materials and Chemical Engineering B	1-0-0	3Q
Introduction of Materials and Chemical Engineering C	1-0-0	4Q

First-Year Courses in the School of Materials and Chemical Technology — purpose, overview, etc.

Course instructors give lectures on recent developments and intriguing topics in the Department of Materials Science and Engineering and the Department of Chemical Science and Engineering and explain, based on specific examples, how research activities can contribute and relate to industry and society. The course content will help students develop into more motivated and independent learners at Tokyo Tech.

By working in a group at laboratories and proactively engaging in joint tasks related to materials and chemical engineering fields, students will deepen their academic interests and critical awareness of issues concerning their research.

Students will also learn and acquire global awareness and scientific and engineering ethics, as well as foundational knowledge required to study 200-level core courses.

< School of Computing >

Course	Number of credits	Quarter when offered
Literacy of Computing	1-0-0	1Q
Foundations of Computing 1	1-0-0	2Q
Foundations of Computing 2	1-0-0	3Q
Foundations of Computing 3	1-0-0	4Q

First-Year Courses in the School of Computing — purpose, overview, etc.

The course aim is to help students:

- expand their perspective on the relation between academia (especially computing-related fields), industry, and society
- develop into motivated and independent learners who actively seek overseas study and research, and have an inquiring mindset and critical awareness of issues concerning their research

In addition, students will increase awareness of research and engineering ethics, and learn the basics of mathematical concepts, notation, logic, etc. that are fundamentally required to study 200-level core courses.

Note:

Literacy of Computing is limited to new students at the School of Computing. Repeating the course is not permitted.

< School of Life Science and Technology >

Course	Number of credits	Quarter when offered
Introduction to Bio-Frontier Research【School of Life Science and Technology】	1-0-0	1Q
* School of Life Science and Technology Literacy	0-2-0	2Q～3Q
* International Bio-Creative Design【School of Life Science and Technology】	0-1-0	4Q

* Courses for Developing Creativity

First-Year Courses in the School of Life Science and Technology — purpose, overview, etc.

Students learn about the current state of the most progressive research in various advanced areas of the life science and technology fields from experts in those areas. This broadens and deepens their interest in the fundamental knowledge, applied technology, and other such matters that are issues in those areas. Students also act on their own initiative to deal with problem-solving related to those issues. This works to develop abundant creativity in a specialized field as well as to develop the critical awareness necessary to pursue more motivated study in major courses. The courses also aim to foster an international sensibility by providing opportunities to engage in discussion and give presentations in English. In this way, students acquire expertise with a global perspective.

< School of Environment and Society >

Course	Number of credits	Quarter when offered
School of Environment and Society Academic Group Literacy	1-0-0	1Q
School of Environment and Society Academic Group Basic Science 1	1-0-0	2Q
School of Environment and Society Academic Group Basic Science 2	1-0-0	3Q
School of Environment and Society Academic Group Basic Science 3	1-0-0	4Q

First-Year Courses in the School of Environment and Society — purpose, overview, etc.

In connection with the engineering fields of architecture and building engineering, civil and environmental engineering, and transdisciplinary science and engineering, students are made broadly aware of connections with

academia, industry, and society, and their critical awareness is awakened and their interest deepened so that they will be able to pursue their study at university in an independent, motivated manner. To that end, they are also given opportunities for edification and thoughtful consideration of appropriate engineering ethics, and are provided fundamental and background knowledge for taking 200-level and higher undergraduate major courses so that they will be able to take up the substance of activities and research relating to planning, structure, and environmental matters.

17. Guide to research opportunity courses

1. Purpose of the research opportunity courses

These courses are one of the prerequisites for initiating the independent research project for a bachelor's degree. The course provides research experience at a number of laboratories. The purpose of these courses is to give students opportunities to come into early contact with research, thereby providing occasions to take specific interest in specialized education at a higher level, i.e. graduate school education.

2. Overview of research opportunity courses

- These are 300-level courses for two credits, and are a required course.
- The courses are basically intended to be taken in the first quarter of the third year, or in the third or fourth quarter.
  (Students who wish to graduate early in three years should take them in the first quarter of the third year.)
- Students experience working in a number of different laboratories.
- Occasionally the courses are also held by a number of laboratories working together as a group.

18. Guide to the independent research project for a bachelor's degree

1. Purpose of the independent research project for a bachelor's degree

Credit for the independent research project for a bachelor's degree is awarded in the same manner as for a course in the specialized field. At Tokyo Tech, this course is required to be taken as an essential condition of graduation. The standard time for taking this course is in the half-year period of the spring semester or the fall semester of the fourth year. The purpose of the independent research project for a bachelor's degree is to have students put together the theory, the experimental work, the investigation, the planning, and other such aspects of their work on their specific topics, to bring the academic achievement they have cultivated up to that point into focus on deeper understanding of the courses in their field of study, and to acquire the methods of putting research into organized order as well as how to write reports, give presentations, and other such skills.

2. Qualification to apply for the independent research project for a bachelor's degree

Students who apply for the independent research project for a bachelor's degree must have satisfied the following three conditions.

(1) They have been enrolled at the university for three or more years. (Note: In the case of early graduation, this is two years and six months or three years.)

(2) They have acquired 110 credits or more, with that number including the following credits and courses.

(a) Nine credits in humanities and social science courses. However, this is to include two credits in 100-level required courses, three credits in 100-level restricted elective courses (one credit each from the three prescribed categories), and four credits in 200–300-level required courses or restricted elective courses.

(b) Six credits in English language courses. However, this is to include four credits in 100-level required courses and two credits in 200–300-level requirements.

(c) Two credits in restricted elective courses in a second foreign language

(d) 14 credits in required basic science and technology courses

(e) Two credits in research opportunity courses

(f) The number of credits in major courses prescribed by the particular school

(3) The major courses satisfy the conditions for the particular undergraduate major as set forth in the Standard Curriculum Guide.

When a standard curriculum is not being followed, the student must have satisfactorily taken the courses in the previously arranged plan.

3. Application procedure for the independent research project for a bachelor's degree

Application for the independent research project for a bachelor's degree must be made using the prescribed application form submitted to the dean of the school within the prescribed period of time, and the application must be approved.

The period in which applications will be received is decided on a case-by-case basis and made known through announcements and so on.

4. Research report for the independent research project for a bachelor's degree

Students who wish to have their independent research project for a bachelor's degree reviewed must submit a research report to their academic adviser.

5. Review of the independent research project for a bachelor's degree

Students who have submitted a research report will have both their research report and an oral presentation reviewed by a review board for the independent research project for a bachelor's degree, which will make a pass/fail

determination. The review board for the independent research project for a bachelor's degree will comprise three or more members appointed from among the professors, associate professors, and lecturers or assistant professors in the field in question here at Tokyo Tech.

6. Academic degrees

Students who have affiliated with one of the departments, who have taken courses according to the standard curriculum recommended for their undergraduate major or some other study program, who have acquired the credits required for graduation and enrolled in an undergraduate program for a certain number of years as designated by Tokyo Tech, and who have had their independent research project for a bachelor's degree reviewed and passed, will receive permission from the faculty council to graduate and will be awarded a bachelor's degree.

The bachelor's degree will have the name of the major field entered on it. Students who have been affiliated with the School of Science and who have, upon due deliberation by that faculty council, received permission to graduate, will be awarded the degree of Bachelor of Science. Students who have been affiliated with the School of Engineering or the School of Environment and Society and who have, upon due deliberation by that faculty council, received permission to graduate, will be awarded the degree of Bachelor of Engineering. Students who have been affiliated with the School of Materials and Chemical Technology, the School of Computing, or the School of Life Science and Technology, and who have, upon due deliberation by that faculty council, received permission to graduate, will be awarded the degree of Bachelor of Science or the degree of Bachelor of Engineering.

7. Miscellaneous

Students who have been enrolled at Tokyo Tech for three years or more, who have been recognized as having acquired the credits prescribed by the school as a requirement for graduation and earned excellent grades, can, upon due deliberation by the faculty council concerned, receive permission to graduate. For information regarding early graduation, please refer to page 26.

19. Guide to the advanced independent research project for a bachelor's degree

1. Purpose of the advanced independent research project for a bachelor's degree

This is a course taken after completing the independent research project for a bachelor's degree in order to conduct further research at a deeper level, to begin preparing to conduct research for a master's degree, or to conduct a new independent research project for the bachelor's degree at a different laboratory from the one where the independent research project for the bachelor's degree was conducted, or by some other such method to conduct research at a deeper level and to increase the breadth of learning.

2. Overview of the advanced independent research project for a bachelor's degree

・This course is taken (for a half-year's credit) after completing the independent research project for a bachelor's degree when there is a half-year or more remaining before graduation. It is taken at the laboratory where the independent research project for a bachelor's degree was conducted.
(In principle, students will be affiliated with laboratories where they conduct the independent research project for a bachelor's degree, even if they will receive research guidance and supervision at different laboratories. However, they may be assigned to other laboratories if it is deemed appropriate for their research.

3. The advanced research project for a bachelor's degree and start of master's-level studies

Following the completion of the independent research project for a bachelor's degree in a spring semester, students will be able to begin the advanced independent research project in a fall semester and start preparing for their master's thesis project. Students start pursuing their specialization during the undergraduate period and delve into a thesis topic after entering a master's program. By starting master's-level studies early in the fall semester of the final undergraduate year, they will have enough time for a long-term study abroad or internship program during the two years of a master's program.

Important points to note:

- The number of course credits that can be attained by completing the advanced research project for a bachelor's degree varies from one to six depending on the duration and other elements of the project. Students must carefully develop a project plan for successful completion.
- Students are allowed to conduct more than one advanced independent research project. For example, after completing a project for three credits, they may launch another project for two credits. However, please be reminded that the maximum number of credits from advanced independent research projects you can use to fulfil graduation requirements is limited to six.
- If they have a half year or more remaining until graduation after completing the independent research project for a bachelor's degree, they may be able to participate in a study abroad and/or internship program in addition to the advanced independent research project.

20. Guide to Undergraduate Major Standard Curricula

This guide introduces the standard curriculum for each undergraduate major and contains information about the following:

- Educational objectives
- Competencies developed
- Learning goals
- List of courses
- Overview of curriculum system
- Example of a standard curriculum
- Requirements to apply for an independent research project for a bachelor's degree
- Graduation requirements
- Seamless transition between bachelor's and master's degree programs

Undergraduate Major in Transdisciplinary Science and Engineering

The sophistication, specialization, and segmentation of existing academic disciplines has led to amazing progress in science and technology. Meanwhile, increasing globalization has rapidly shrunk the world, leading to the manifestation of complex, crosscutting issues that the international community must face, and that cannot be solved by simply combining individual elemental technologies.

Global environmental problems represent one notable example of these issues. Furthermore, the industrial and social maturation of Japan and other advanced countries has quickened the evolution of their industrial structures. Consequently, society has started to demand the creation of new technologies, values, and concepts from a broad perspective that transcends the bounds of existing academic frameworks.

The objective of the Department of Transdisciplinary Science and Engineering is to foster the ability necessary to understand and comprehensively integrate existing academic frameworks in response to the aforementioned social changes. We strive to develop individuals with the skills needed to solve the complex issues the international community faces — such as problem-finding and solving skills, and creative thinking and execution skills — and to create the new technologies, values, and concepts that society demands. We also aim to develop global engineers with co-creation skills. This encompasses the communication skills needed to play an active role in international collaborations with engineers from other fields and the management skills to drive complex projects and organizations.

Our curriculum is comprised of course groups covering various subjects, such as International Development, Environmental Policy and Social Systems, Resource and Energy Engineering, Global and Regional Environment, Engineering Design, and Nuclear Engineering. We are pursuing transdisciplinary education and research that will go beyond the bounds of such academic disciplines and solve problems through collaborations with society.

Educational objectives

We aim to help students develop into individuals who understand and integrate the frameworks of science and engineering, can contribute to solving the complex issues faced by the international community, and can lead international collaboration in creating the new technologies, values, and concepts that society demands.

Competencies developed

1. Basic skills applicable to a range of fields
    - Logical and mathematical thinking and analytical skills
    - Understanding of physical and natural phenomena
    - Versatile measurement and calculation skills
2. Applied skills not bound to existing academic disciplines
    - Skills to solve a given problem with appropriate methods
    - Skills to plan, propose, and test new technologies, values, and concepts
    - Skills to understand and operate systems
3. Personal and social skills needed as a global engineer
    - Communication skills
    - Social responsibility and ethics
    - Independent mindset and ability to take action

Learning goals

A) Basic skills applicable to a range of fields (logical and mathematical thinking and analytical skills, an understanding of physical and natural phenomena, and versatile measurement and calculation skills)

B) Applied skills not bound to existing academic disciplines (skills to solve a given problem with appropriate methods and to understand and operate systems)

C) Personal and social skills needed as a global engineer (communication skills, social responsibility and ethics, independent mindset and ability to take action)

Courses

Course categories	Course level	Course number	Course			Number of credits	Competencies to acquire	Learning goals	Remarks
Major Courses (200)	200	TSE.A201.R	◎		材料・物性工学基礎 (Material and Molecular Engineering)	2-0-0	1	A	English class available (★)
	200	TSE.A202.R	◎		固体・構造力学基礎 (Solid Mechanics and Structure Engineering)	2-0-0	145	A	English class available (★)
	200	TSE.A203.R	◎		電気・磁気工学基礎 (Electrical Engineering)	2-0-0	1 4	A	English class available (★)
	200	TSE.A204.R	◎		熱力学基礎 (Engineering Thermodynamics)	2-0-0	1	A	English class available (★)
	200	TSE.A205.R	◎		流体工学基礎 (Fluid Engineering)	2-0-0	1	A	English class available (★)
	200	TSE.A206.R	◎		生物工学基礎 (Biological engineering)	2-0-0	145	A,B	English class available (★)
	200	TSE.A232.R	◎	★	Engineering Measurement I （工学計測基礎第一）	1-0-0	1 5	A	
	200	TSE.A233.R	◎		工学計測基礎第二 (Engineering Measurement II)	1-0-0	1 5	A	English class available (★)
	200	TSE.C201.R	◎	★	Introduction to Transdisciplinary Science and Engineering （融合理工学基礎）	0-1-0	2345	C	
	200	TSE.C202.R	◎	★	System Design Project （システムデザインプロジェクト）	0-1-0	345	B	
	200	TSE.C203.R	◎	★	Transdisciplinary Design Project （融合デザインプロジェクト）	1-1-0	234	B	*
	200	TSE.C204.R	◎	★	System Design & Impact Assessment （システムデザイン・インパクトアセスメント）	0-1-0	135	A,B	
	200	TSE.M201.R	◎		常微分方程式と物理現象 (Ordinary Differential Equations and Physical Phenomena)	1-1-0	145	A	English class available (★)
	200	TSE.M202.R	◎		偏微分方程式と物理現象 (Partial Differential Equations and Physical Phenomena)	1-1-0	1 5	A	English class available (★)
	200	TSE.M203.R	◎		線形システム論 (Theory of Linear System)	1-1-0	1	A	English class available (★)

Course categories	Course level	Course number	Course			Number of credits	Competencies to acquire	Learning goals	Remarks
	200	TSE.M204.R	◎		統計とデータ解析 (Statistics and Data Analysis)	1-1-0	1 5	A,B	English class available (★)
	200	TSE.K211.L			機械力学 (Mechanical Vibrations)	1.5-0.5-0	1	A	e, Undergraduate major in Mechanical Engineering (MEC.D201)
	200	TSE.K212.L			熱力学 (機械) (Thermodynamics (Mechanical Engineering))	1.5-0.5-0	1	A	f, Undergraduate major in Mechanical Engineering (MEC.E201)
	200	TSE.K213.L			基礎流体力学 (Fundamentals of Fluid Mechanics)	2-0-0	1	A	b, Undergraduate major in Mechanical Engineering (MEC.F201)
Major Courses (200)	200	TSE.K214.L			実在流体力学 (Practical Fluid Mechanics)	1.5-0.5-0	1	A	f, Undergraduate major in Mechanical Engineering (MEC.F211)
	200	TSE.K215.L			機械材料工学 (Mechanical Materials)	2-0-0	1	A	f, Undergraduate major in Mechanical Engineering (MEC.G211)
	200	TSE.K216.L			機械要素設計 (Design of Machine Elements)	2-0-0	1 5	A	e, Undergraduate major in Mechanical Engineering (MEC.H211)
	200	TSE.K218.L			ロボット機構学 (Robot Kinematics)	2-0-0	1	A	e, Undergraduate major in Mechanical Engineering (MEC.I211)
	200	TSE.E211.L			アナログ電子回路 (Analog Electronic Circuits)	2-0-0	1 5	A	e, Undergraduate major in Electrical and Electronic Engineering (EEE.C211)
	200	TSE.E212.L			制御工学 (Control theory)	2-0-0	1 5	A	f, Undergraduate major in Electrical and Electronic Engineering (EEE.C261)
	200	TSE.E213.L			量子力学 (Quantum Mechanics)	2-0-0	1 5	A	f, Undergraduate major in Electrical and Electronic Engineering (EEE.D201)
	200	TSE.E214.L			電磁気学第一(Electricity and Magnetism I)	2-0-0	1 5	A	f, Undergraduate major in Electrical and Electronic Engineering (EEE.E201)
	200	TSE.E215.L			電磁気学第二(Electricity and Magnetism II)	2-0-0	1 5	A	f, Undergraduate major in Electrical and Electronic Engineering (EEE.E202)
	200	TSE.E216.L			波動工学(Electromagnetic Fields and Waves)	2-0-0	1 5	A	f, Undergraduate major in Electrical and Electronic Engineering (EEE.E211)
	200	TSE.E217.L			情報通信概論(Introduction to Information and Communications Engineering)	2-0-0	1 5	A	e, Undergraduate major in Information and Communications Engineering (ICT.C201)
	200	TSE.E218.L			論理回路設計(Theory and Design of Logic Circuits)	2-0-0	1 5	A	e, Undergraduate major in Information and Communications Engineering目 (ICT.I211)
	200	TSE.H211.L			材料の熱的機械的性質 (Mechanical and Thermal Properties of Materials)	2-0-0	1 5	A	f, Undergraduate major in Materials Science and Engineering (MAT.A206)

Course categories	Course level	Course number	Course			Number of credits	Competencies to acquire	Learning goals	Remarks
	200	TSE.H212.L			金属学概論(Introduction to Metallurgy)	2-0-0	1	A	f, Undergraduate major in Materials Science and Engineering (MAT.M204)
	200	TSE.H213.L			物理化学第一（熱力学法則）(Physical Chemistry I (Thermodynamics))	1-0-0	145	A	f, Undergraduate major in Chemical Science and Engineering (CAP.B216)
	200	TSE.H214.L			物理化学第二（化学平衡）(Physical Chemistry II (Chemical Equilibrium))	1-0-0	145	A	f, Undergraduate major in Chemical Science and Engineering (CAP.B217)
	200	TSE.H215.L			物理化学第三（反応速度論）(Physical Chemistry III (Kinetics))	1-0-0	1	A	f, Undergraduate major in Chemical Science and Engineering (CAP.B218)
	200	TSE.H216.L			無機化学（元素と化合物）(Inorganic Chemistry (Elements and Compounds))	1-0-0	1 5	A	f, Undergraduate major in Chemical Science and Engineering (CAP.B224)
	200	TSE.H217.L			化学プロセス量論(Chemical Process Stoichiometry)	1-0-0	1	A	b, Undergraduate major in Chemical Science and Engineering (CAP.C205)
	200	TSE.H218.L			エネルギー操作(Energy Transfer Operation)	1-0-0	145	A	b/f, Undergraduate major in Chemical Science and Engineering 目 (CAP.C211)
	200	TSE.H219.L			分離操作(Separation Operation)	1-0-0	145	A	b, Undergraduate major in Chemical Science and Engineering (CAP.C212)
	200	TSE.H220.L			化学プロセスシステム第一（制御）(Chemical Process System I (Control))	1-0-0	1	A	b, Undergraduate major in Chemical Science and Engineering (CAP.C213)
	200	TSE.H221.L			分子生物学第一(Molecular Biology I)	2-0-0	1 4	A	b, Undergraduate major in Life Science and Technology (LST.A208)
	200	TSE.H222.L			生命統計学(Biostatistics)	2-0-0	1 5	A	b, Undergraduate major in Life Science and Technology (LST.A241)
	200	TSE.D211.L			水理学第一(Hydraulics I)	2-0-0	1	A	d, Undergraduate major in Civil and Environmental Engineering (CVE.B201)
	200	TSE.D212.L			水理学第二(Hydraulics II)	2-0-0	1	A	d, Undergraduate major in Civil and Environmental Engineering (CVE.B202)
Major Courses (200)	200	TSE.D213.L			土木と環境の計画理論 (Planning Theory for Civil and Environmental Engineering)	2-0-0	145	A	a/c, Undergraduate major in Civil and Environmental Engineering (CVE.D210)
	200	TSE.D214.L			国土・都市計画概論 (Introduction to National Land Use and City Planning)	2-0-0	1 4	A	a/c, Undergraduate major in Civil and Environmental Engineering (CVE.D211)
	200	TSE.D216.L			社会基盤と環境-概論 (Introduction to Infrastructure and Environment)	2-0-0	1	A	c/d, Undergraduate major in Civil and Environmental Engineering (CVE.N210)
	200	TSE.D231.L			景観工学	2-0-0	1 4	A	c/d, Undergraduate major in Civil and Environmental Engineering (CVE.D231)

Course categories	Course level	Course number			Course	Number of credits	Competencies to acquire	Learning goals	Remarks
Major Courses (300)	300	TSE.A313.L			資源・エネルギー工学概論 (Theory of Resource and Energy Engineering)	1-0-0	145	A	b
	300	TSE.C314.L		★	Environment and Society	2-0-0	2345	C	
	300	TSE.A311.L			原子核工学概論 (Introduction to Nuclear Engineering)	2-0-0	1 5	A	f
	300	TSE.A312.L			地球・地域生態学概論 (Introduction to global and local ecology)	2-0-0	1 4	A,B	d
	300	TSE.A314.L			水・物質循環システム概論 (Introduction to Water and Mass Transport in the Environment)	1-0-0	1 5	A	d
	300	TSE.A315.L			気象学基礎(Introduction to Meteorology)	2-0-0	1	A	d
	300	TSE.A316.L			防災工学基礎(Introduction to Natural Disaster Science and Engineering)	1-0-0	1 5	A	d
	300	TSE.A317.L			環境流体力学基礎(Basis of Environmental Hydrodynamics)	1-0-0	1 5	A	d
	300	TSE.A318.L			エンジニアリングデザイン概論 (Introduction to Design Engineering)	1-0-0	134	A	e
	300	TSE.A341.L			国際エンジニアリングデザインプロジェクト基礎F (International Engineering Design Experiences (Fall Semester))	2-0-0	3 5	B	e
	300	TSE.A342.L			国際エンジニアリングデザインプロジェクト基礎S (International Engineering Design Experiences (Spring Semester))	2-0-0	3 5	B	e
	300	TSE.A351.R	◎		融合理工学実験A (Transdisciplinary Engineering Experiment A)	0-0-1	134	A,B	English class available (★)
	300	TSE.A352.R	◎		融合理工学実験B (Transdisciplinary Engineering Experiment B)	0-0-1	134	A,B	English class available (★)
	300	TSE.C301.L		★	Introduction to International Development (国際開発共創概論)	2-0-0	2345	C	a
	300	TSE.C302.L		★	Introduction to Development Economics (開発経済学入門)	2-0-0	123	C	a
	300	TSE.C303.R	◎	★	Project Management (プロジェクトマネジメント)	1-0-1	2345	B,C	
	300	TSE.C312.L		★	Introduction to Environmental Policy and Social System (社会環境政策概論)	2-0-0	1 5	A	c
	300	TSE.A303.L		★	Unit operations (操作論)	2-0-0	1 5	A	Japanese class only (2021 academic year)

Course categories	Course level	Course number			Course	Number of credits	Competencies to acquire	Learning goals	Remarks
	300	TSE.A304.L		★	Industrial chemistry (工業化学)	2-0-0	15	A	
	300	TSE.A302.L		★	Mechanics of strength (強度の力学)	1-0-0	15	A	
	300	TSE.A321.L		★	Introduction to metallurgy of engineering materials (：実用材料の冶金学基礎)	1-0-0	15	A	
	300	TSE.A301.L		★	Rigid body dynamics (剛体の運動力学)	1-0-0	15	A	
Major Courses (300)	300	TSE.A305.L		★	Electromagnetics (TSE) (電磁気学 (融合理工))	2-0-0	15	A	
	300	TSE.A322.L		★	Communication and network (通信とネットワーク)	2-0-0	15	A	
	300	TSE.A335.L		★	Basic theory of regional and global environment 1 (地域・地球環境概論第 1)	2-0-0	15	A	
	300	TSE.A336.L		★	Basic theory of regional and global environment 2 (地域・地球環境概論第 2)	2-0-0	15	A	
	300	TSE.A337.L		★	Basic Nuclear Engineering 1 (原子核工学基礎第 1)	1-0-0	15	A	
	300	TSE.A338.L		★	Basic Nuclear Engineering 2 (原子核工学基礎第 2)	1-0-0	15	A	
	300	TSE.A339.L		★	Basic Nuclear Engineering 3 (原子核工学基礎第 3)	1-0-0	15	A	
	300	TSE.A340.L		★	Basic Nuclear Engineering 4 (原子核工学基礎第 4)	1-0-0	15	A	
	300	TSE.A307.L			Programming and numerical analysis プログラミングと数値解析基礎	1-1-0	15	A	English class available (★)
	300	TSE.A324.L		★	Applied programming and numerical analysis (プログラミングと数値解析応用)	1-1-0	15	A	
	300	TSE.M301.L		★	Probability theory (TSE) (確率論 (融合理工))	2-0-0	15	B	
	300	TSE.C304.L			国際プロジェクト演習 (Exercises on International Development Engineering)	0.5-0.5-0	245	C	
	300	TSE.C317.L		★	Methodology of Transdisciplinary Research:theory and practice (融合技術論)	0-1-0	125	B	
	300	TSE.C318.L			Introduction to Engineering Design and Management of Technology エンジニアリングデザインと技術経営基礎	1-1-0	45	B	English class in odd-numbered years (★)

Course categories	Course level	Course number			Course	Number of credits	Competencies to acquire	Learning goals	Remarks
	300	TSE.C321.L		★	Energy&Environment (TSE)（エネルギーと環境（融合理工))	0.5-0.5-0	135	B	
	300	TSE.C341.L			融合理工学海外研修（超短期）A (Transdisciplinary science and engineering international training (very short term) A)	0-0-1	3 5	C	
	300	TSE.C342.L			融合理工学海外研修（超短期）B (Transdisciplinary science and engineering international training (very short term) B)	0-0-1	3 5	C	
	300	TSE.C343.L			融合理工学海外研修（超短期）C (Transdisciplinary science and engineering international training (very short term) C)	0-0-1	3 5	C	
	300	TSE.C344.L			融合理工学海外研修（超短期）D (Transdisciplinary science and engineering international training (very short term) D)	0-0-1	3 5	C	
	300	TSE.C345.L			融合理工学海外研修（短期）A (Transdisciplinary science and engineering international training (short term) A)	0-0-2	3 5	C	
	300	TSE.C346.L			融合理工学海外研修（短期）B (Transdisciplinary science and engineering international training (short term) B)	0-0-2	3 5	C	
	300	TSE.C347.L			融合理工学海外研修（短期）C (Transdisciplinary science and engineering international training (short term) C)	0-0-2	3 5	C	
	300	TSE.C348.L			融合理工学海外研修（短期）D (Transdisciplinary science and engineering international training (short term) D)	0-0-2	3 5	C	
Major Courses (300)	300	TSE.C349.L			融合理工学海外研修（中期）A (Transdisciplinary science and engineering international training (middle term) A)	0-0-3	3 5	C	
	300	TSE.C350.L			融合理工学海外研修（中期）B (Transdisciplinary science and engineering international training (middle term) B)	0-0-3	3 5	C	
	300	TSE.C351.L			融合理工学海外研修（中期）C (Transdisciplinary science and engineering international training (middle term) C)	0-0-3	3 5	C	
	300	TSE.C352			融合理工学海外研修（中期）D (Transdisciplinary	0-0-3	3 5	C	

Course categories	Course level	Course number	Course			Number of credits	Competencies to acquire	Learning goals	Remarks
		.L			science and engineering international training (middle term) D)				
	300	TSE.C353.L			融合理工学海外研修（長期）A (Transdisciplinary science and engineering international training (long term) A)	0-0-4	3 5	C	
	300	TSE.C354.L			融合理工学海外研修（長期）B (Transdisciplinary science and engineering international training (long term) B)	0-0-4	3 5	C	
	300	TSE.C355.L			融合理工学海外研修（長期）C (Transdisciplinary science and engineering international training (long term) C)	0-0-4	3 5	C	
	300	TSE.C356.L			融合理工学海外研修（長期）D (Transdisciplinary science and engineering international training (long term) D)	0-0-4	3 5	C	
	300	TSE.C357.L			融合理工学海外研修（単位認定併用）S (Transdisciplinary science and engineering international training (with credit transfer) S)	0-0-1	3 5	C	
	300	TSE.C358.L			融合理工学海外研修（単位認定併用）F (Transdisciplinary science and engineering international training (with credit transfer) F)	0-0-1	3 5	C	
	300	TSE.C361.L			融合理工学インターンシップ（超短期）A (Transdisciplinary science and engineering internship (very short term) A)	0-0-1	3 5	C	
	300	TSE.C362.L			融合理工学インターンシップ（超短期）B (Transdisciplinary science and engineering internship (very short term) B)	0-0-1	3 5	C	
	300	TSE.C363.L			融合理工学インターンシップ（超短期）C (Transdisciplinary science and engineering internship (very short term) C)	0-0-1	3 5	C	
	300	TSE.C364.L			融合理工学インターンシップ（超短期）D (Transdisciplinary science and engineering internship (very short term) D)	0-0-1	3 5	C	
	300	TSE.C365.L			融合理工学インターンシップ（短期）A (Transdisciplinary science and engineering internship (short term) A)	0-0-2	3 5	C	
	300	TSE.C366.L			融合理工学インターンシップ（短期）B (Transdisciplinary science and engineering	0-0-2	3 5	C	

Course categories	Course level	Course number			Course	Number of credits	Competencies to acquire	Learning goals	Remarks
					internship (short term) B)				
	300	TSE.C367.L			融合理工学インターンシップ（短期）C (Transdisciplinary science and engineering internship (short term) C)	0-0-2	3 5	C	
	300	TSE.C368.L			融合理工学インターンシップ（短期）D (Transdisciplinary science and engineering internship (short term) D)	0-0-2	3 5	C	
	300	TSE.C369.L			融合理工学インターンシップ（中期）A (Transdisciplinary science and engineering internship (middle term) A)	0-0-3	3 5	C	
	300	TSE.C370.L			融合理工学インターンシップ（中期）B (Transdisciplinary science and engineering internship (middle term) B)	0-0-3	3 5	C	
	300	TSE.C371.L			融合理工学インターンシップ（中期）C (Transdisciplinary science and engineering internship (middle term) C)	0-0-3	3 5	C	
	300	TSE.C372.L			融合理工学インターンシップ（中期）D (Transdisciplinary science and engineering internship (middle term) D)	0-0-3	3 5	C	
	300	TSE.C373.L			融合理工学インターンシップ（長期）A (Transdisciplinary science and engineering internship (long term) A)	0-0-4	3 5	C	
	300	TSE.C374.L			融合理工学インターンシップ（長期）B (Transdisciplinary science and engineering internship (long term) B)	0-0-4	3 5	C	
	300	TSE.C375.L			融合理工学インターンシップ（長期）C (Transdisciplinary science and engineering internship (long term) C)	0-0-4	3 5	C	
	300	TSE.C376.L			融合理工学インターンシップ（長期）D (Transdisciplinary science and engineering internship (long term) D)	0-0-4	3 5	C	
Research-Related Courses (300)	300	TSE.Z381.R	◎		研究プロジェクト(Research opportunity in Laboratories) (Department of Transdisciplinary Science and Engineering)	0-0-2	145	A,B	
	300	TSE.Z389.R	◎		学士特定課題研究(Independent research project) (Department of Transdisciplinary Science and Engineering)	0-0-6	145	A,B	
	300	TSE.Z371.L			学士特定課題プロジェクトS1c(Advanced independent research project S1c) (Department of Transdisciplinary Science and Engineering)	0-0-1	145	A,B	
	300	TSE.Z372.L			学士特定課題プロジェクトS2c(Advanced independent research project S2c)(Department of Transdisciplinary Science and	0-0-2	145	A,B	

Course categories	Course level	Course number			Course	Number of credits	Competencies to acquire	Learning goals	Remarks
					Engineering)				
	300	TSE.Z373.L			学士特定課題プロジェクト S3c(Advanced independent research project S3c)(Department of Transdisciplinary Science and Engineering)	0-0-3	145	A,B	
	300	TSE.Z374.L			学士特定課題プロジェクト S4c(Advanced independent research project S4c)(Department of Transdisciplinary Science and Engineering)	0-0-4	145	A,B	
	300	TSE.Z375.L			学士特定課題プロジェクト S5c(Advanced independent research project S5c)(Department of Transdisciplinary Science and Engineering)	0-0-5	145	A,B	
	300	TSE.Z376.L			学士特定課題プロジェクト S6c(Advanced independent research project S6c)(Department of Transdisciplinary Science and Engineering)	0-0-6	145	A,B	
	300	TSE.Z391.L			学士特定課題プロジェクト F1c(Advanced independent research project F1c)(Department of Transdisciplinary Science and Engineering)	0-0-1	145	A,B	
	300	TSE.Z392.L			学士特定課題プロジェクト F2c(Advanced independent research project F2c)(Department of Transdisciplinary Science and Engineering)	0-0-2	145	A,B	
	300	TSE.Z393.L			学士特定課題プロジェクト F3c(Advanced independent research project F3c)(Department of Transdisciplinary Science and Engineering)	0-0-3	145	A,B	
	300	TSE.Z394.L			学士特定課題プロジェクト F4c(Advanced independent research project F4c)(Department of Transdisciplinary Science and Engineering)	0-0-4	145	A,B	
	300	TSE.Z395.L			学士特定課題プロジェクト F5c(Advanced independent research project F5c)(Department of Transdisciplinary Science and Engineering)	0-0-5	145	A,B	
	300	TSE.Z396.L			学士特定課題プロジェクト F6c(Advanced independent research project F6c)(Department of Transdisciplinary Science and Engineering)	0-0-6	145	A,B	
Major Courses (300)	300	TSE.C331.L		★	Advanced English Communication for Engineers (科学技術者実践英語)	1-0-0	235	C	Common courses (XEN.E301)
	300	TSE.K311.L			伝熱学 (Heat Transfer)	1.5-0.5-0	1	A,B	b/f, Undergraduate major in Mechanical Engineering (MEC.E311)
	300	TSE.K312.L			エネルギー変換工学 (Energy Conversion)	1.5-0.5-0	1 5	A,B	b/f, Undergraduate major in Mechanical Engineering

Course categories	Course level	Course number	Course			Number of credits	Competencies to acquire	Learning goals	Remarks
									(MEC.E331)
	300	TSE.K313.L			応用流体力学 (Advanced Fluid Mechanics)	1-0-0	1 5	A,B	f, Undergraduate major in Mechanical Engineering (MEC.F331)
	300	TSE.K314.L			加工学概論 (Introduction to Manufacturing Engineering)	2-0-0	1	A,B	e, Undergraduate major in Mechanical Engineering (MEC.G311)
	300	TSE.K315.L			メカトロニクス工学 (機械) (Mechatronics (Mechanical Engineering))	2-0-0	1 5	A,B	e, Undergraduate major in Mechanical Engineering (MEC.I331)
	300	TSE.K316.L			精密機械基礎学 (Fundamentals of Precision Machinery)	1-0-0	1	A,B	e, Undergraduate major in Mechanical Engineering (MEC.J311)
	300	TSE.K317.L			CAE 概論 (Fundamentals of Computer Aided Engineering)	1-0-0	1	A,B	e, Undergraduate major in Mechanical Engineering (MEC.K331)
	300	TSE.K318.L			宇宙開発工学(Advanced Space Engineering)	2-0-0	1	A,B	e, Undergraduate major in Mechanical Engineering (MEC.M333)
	300	TSE.E311.L			電子計測(Electronic Measurement)	2-0-0	1 5	A,B	f, Undergraduate major in Electrical and Electronic Engineering (EEE.C301)
	300	TSE.E312.L			電気機器工学(Electric Machinery and apparatus)	2-0-0	1 5	A,B	e, Undergraduate major in Electrical and Electronic Engineering (EEE.P301)
	300	TSE.E313.L			パワーエレクトロニクス(Power Electronics)	2-0-0	1 5	A,B	f, Undergraduate major in Electrical and Electronic Engineering (EEE.P311)
Major Courses (300))	300	TSE.E314.L			電力工学第一(Electric Power Engineering I)	2-0-0	1	A,B	e, Undergraduate major in Electrical and Electronic Engineering (EEE.P321)
	300	TSE.E315.L			電力工学第二(Electric Power Engineering II)	2-0-0	1	A,B	e, Undergraduate major in Electrical and Electronic Engineering (EEE.P322)
	300	TSE.E316.L			高電圧工学(High Voltage Engineering)	2-0-0	1	A,B	f, Undergraduate major in Electrical and Electronic Engineering (EEE.P331)
	300	TSE.E317.L			通信理論 (電気電子) (Communication Theory (Electrical and Electronic Engineering))	2-0-0	1	A,B	e, Undergraduate major in Electrical and Electronic Engineering (EEE.S341)
	300	TSE.H312.L			化学プロセスシステム第二 (設計) (Chemical Process System II (Design))	1-0-0	1	A,B	b, Undergraduate major in Chemical Science and Engineering (CAP.C313)
	300	TSE.H313.L			ケミカルエンジニアリングデザイン (Chemical Engineering Design)	1-0-0	245	A,B	b, Undergraduate major in Chemical Science and Engineering (CAP.C322)
	300	TSE.H317.L			放射化学(Radiation Chemistry)	1-0-0	1	A,B	f, Undergraduate major in Chemical Science and Engineering (CAP.E361)
	300	TSE.H318.L			原子力化学工学(Nuclear Chemical Engineering)	1-0-0	1	A,B	f, Undergraduate major in Chemical Science and Engineering (CAP.E362)
	300	TSE.H319.L			環境生物工学(Environmental Bioengineering)	2-0-0	145	A,B	b, Undergraduate major in Life Science and Technology (LST.A363)

Course categories	Course level	Course number	Course			Number of credits	Competencies to acquire	Learning goals	Remarks
	300	TSE.D311.L			海岸・海洋工学(Coastal Engineering and Oceanography)	1-0-0	1 4	A	d, Undergraduate major in Civil and Environmental Engineering (CVE.B310)
	300	TSE.D312.L			河川工学(River Engineering)	2-0-0	1 4	A	d, Undergraduate major in Civil and Environmental Engineering (CVE.B311)
	300	TSE.D313.L			交通システム工学(Traffic and Transportation Systems)	2-0-0	1	A	a, Undergraduate major in Civil and Environmental Engineering (CVE.D301)
	300	TSE.D315.L			公共経済学(Public Economics)	1-0-0	1	A	c, Undergraduate major in Civil and Environmental Engineering (CVE.D311)
	300	TSE.D317.L			インフラストラクチャーの都市計画 (Urban Planning and Infrastructure)	2-0-0	12345	A	a, Undergraduate major in Civil and Environmental Engineering (CVE.D313)
	300	TSE.D318.L			水環境工学(Water Environmental Engineering)	2-0-0	1 5	A	c/d, Undergraduate major in Civil and Environmental Engineering (CVE.G310)
	300	TSE.D319.L			数値解析基礎・演習(Computers and Fundamental Programming)	1-1-0	1	A	d, Undergraduate major in Civil and Environmental Engineering (CVE.M301)
	300	TSE.D320.L			景観設計演習	0-0-2	345	A	d, Undergraduate major in Civil and Environmental Engineering (CVE. D316)

Courses marked with ★ are taught in English.

Course(s) marked with an asterisk (*) in the “Remarks” column are Course(s) for Developing Creativity.

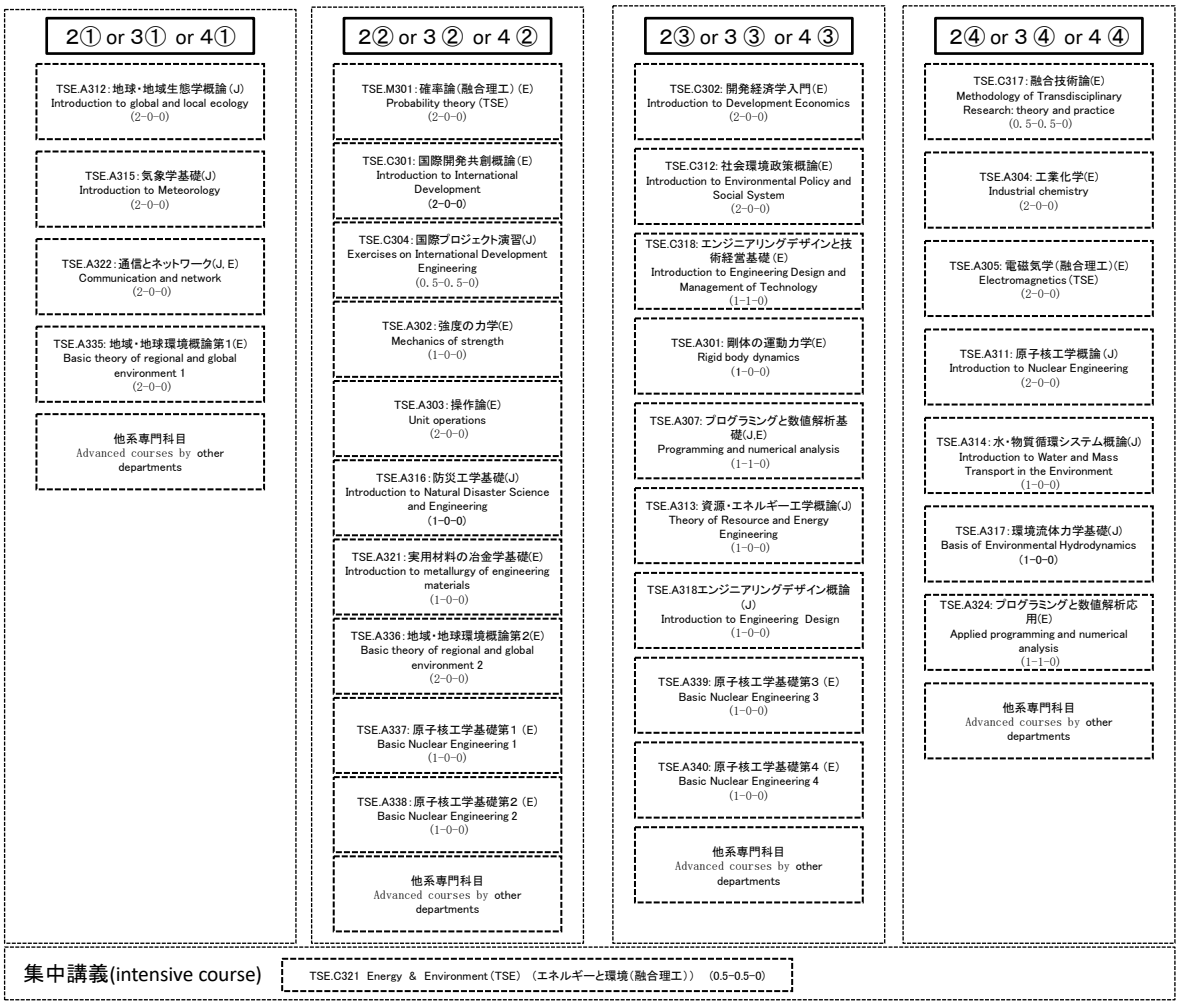
Competencies to acquire:

1: Specialist skills, 2: Liberal arts skills, 3: Communication skills, 4: Applied skills (inquisitive thinking and/or problem-finding skills), 5: Applied skills (practical and/or problem-solving skills)

Learning goals:

A: Basic skills applicable to a range of fields, B: Applied skills not bound to existing academic disciplines, C: Personal and social skills needed as a global engineer

Major elective courses (300-level)
Note: (J) indicates that the course is taught in Japanese. (E) indicates that the course is taught in English. As a general rule, students should prioritize taking the required courses (200-level) first.



Eligibility for the independent research project

In addition to satisfying the institute-wide requirements (please see the corresponding section of this study guide), students must:

1. Have earned at least twenty-eight (28) credits from the required undergraduate major courses (marked with a ◎) listed in the table
2. Have completed the Research Opportunity in Laboratories course listed in the research-related course section of the table
3. Have earned at least forty-four (44) credits from the courses listed in the table

Graduation requirements

In addition to satisfying the institute-wide requirements (please see the corresponding section of this study guide), students must also:

1. Have earned thirty-one (31) credits by completing all of the required undergraduate major courses (marked with a ◎) listed in the table
2. Have completed the Research Opportunity in Laboratories and the independent research project courses listed in the research-related course section of the table
3. Have earned at least fifty (50) credits from the courses listed in the table
4. Have earned at least 124 total credits

Seamless transition between bachelor's and master's programs

Students in the Department of Transdisciplinary Science and Engineering will acquire broad knowledge and skills related to engineering through the Foundation in Mathematics and Foundation in Engineering courses. In addition, they will improve their problem-finding skills as well as their ability to co-create with diverse people through the Foundation in Co-creation courses. Based on their academic interests, students will proactively select from among diverse elective course options, and design and proceed with their own study plan in consultation with faculty members.

The Department of Transdisciplinary Science and Engineering offers four graduate majors for a master's degree program. The Graduate Major in Global Engineering for Development, Environment and Society is designed to deepen students' understanding of transdisciplinary science and engineering, and is supervised by a comparably large number of faculty members. The Graduate Major in Engineering Sciences and Design, the Graduate Major in Energy Science and Engineering, and the Graduate Major in Nuclear Engineering cover multiple disciplines. Each has unique characteristics. We recommend that you explore those fields by taking elective courses that match your interests, fully leveraging our flexible curriculum for the bachelor's degree program.