Study Guide

1. Introduction

(1) Schools, undergraduate majors, and academic groups

Here at Tokyo Tech, the undergraduate majors and corresponding academic groups in each school are as follows.

School	Undergraduate major	Corresponding academic group
School of Science	Undergraduate major in Mathematics	First Academic Group
	Undergraduate major in Physics	First Academic Group
	Undergraduate major in Chemistry	First Academic Group
	Undergraduate major in Earth and Planetary Sciences	First Academic Group
School of Engineering	Undergraduate major in Mechanical Engineering	Fourth Academic Group
	Undergraduate major in Systems and Control Engineering	Fourth Academic Group and Fifth Academic Group
	Undergraduate major in Electrical and Electronic Engineering	Fifth Academic Group
	Undergraduate major in Information and Communications Engineering	Fifth Academic Group
	Undergraduate major in Industrial Engineering and Economics	Third Academic Group and Fourth Academic Group
School of Materials and Chemical Technology	Undergraduate major in Materials Science and Engineering	Second Academic Group
	Undergraduate major in Chemical Science and Engineering	Third Academic Group
School of Computing	Undergraduate major in Mathematical and Computing Science	First Academic Group
	Undergraduate major in Computer Science	Fifth Academic Group
School of Life Science and Technology	Undergraduate major in Life Science and Technology	Seventh Academic Group
School of Environment and Society	Undergraduate major in Architecture and Building Engineering	Sixth Academic Group
	Undergraduate major in Civil and Environmental Engineering	Sixth Academic Group
	Undergraduate major in Transdisciplinary Science and Engineering	Fourth Academic Group and Sixth Academic Group

(2) Courses and studies

Course categories

The courses here at Tokyo Tech can be divided into the liberal arts course group and the specialized 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 code
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, Italian, Korean, Spanish	200–300-level
	Japanese language and culture courses	Courses for the education of international exchange students	100–200-level
	Teacher training courses	Teacher training 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 (some 200-level)
Major course group	Major courses	Creative process courses, academic group courses	100-level
		Common courses, undergraduate major courses	200–300-level
	Research-related courses	Research opportunity courses, independent research project for the Bachelor's Degree, Advanced independent research project for the Bachelor's Degree	300-level

Course numbering and codes

Every course is assigned a course code to indicate the level of study, its order in a sequence, and so on, 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 codes. (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 undergraduate major affiliation, to the start of an independent research project for the 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 appended tables of standard study programs and the syllabi for each undergraduate major.

・Intercultural skills

The awareness and knowledge that an independent person needs as a human being as well as the knowledge and linguistic ability needed to communicate with others, including people from other countries

・Communication skills

The skills that are needed to communicate with others and to build a consensus in light of your own knowledge and experience

・Competencies relating to major

The knowledge and academic ability required to conduct research and technical development in the specialized field of your interest

・Critical thinking skills

The reasoning ability needed to resolve the gap between the way things are and the way they should be, or to address questions about why something happens the way it does, and other such issues

・Practical and/or problem-solving skills

The ability to work from the theory and principle in your own knowledge, experience, ideas, and so on, to (1) take a course of action with regard to an issue or toward an objective, (2) to tackle the resolution of questions that have no answers or of problems in actual society, and (3) to create and disseminate new knowledge

Academic terms 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 term. From the day after the end of the spring term to March is the fall term. Each term is further divided into a first half and second half, which are quarters. As a rule, courses are held by quarters, 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.

Terms	Spring term		Fall term	
	April to the fourth or fifth week in September		Day after the last day of spring term to March	
Educational 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: (Study takes place by academic group) All students alike mainly take 100-level humanities and social science courses, English language courses, basic science and technology courses, breadth courses, and the major courses of the particular academic group. The courses taken here have to satisfy the credit requirements for undergraduate major 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 an undergraduate major and take the major courses (basically 200-level courses) for the standard study program of the undergraduate major.

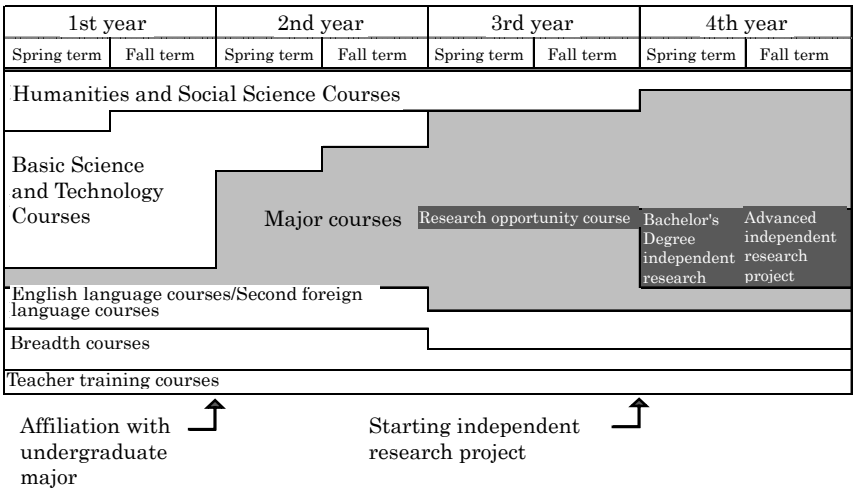
3rd year of admission: (Study takes place by undergraduate major) Students take further 200–300-level humanities and social science courses, English language courses, second foreign language courses, breadth courses, and major courses in the undergraduate major, and also take research opportunity courses. 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 the Bachelor's Degree. When there is a further period of enrollment left before graduation, students will follow the independent research project for the Bachelor's Degree by pursuing an advanced independent research project for the Bachelor's Degree.

* In the case of early graduation (see p. 26), students will satisfy those requirements and then begin their independent research project for the Bachelor's Degree in the fall term of the third year of admission or the spring term of the fourth year of admission.

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 term 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 term are shown in Table 4.

Earning the credits requires proceeding systematically with your studies, allocating courses by term and quarter.

The fourth year of admission, in particular, is when the independent research project for the 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

<table>
<tr><th rowspan="2">Category
Courses</th><th colspan="3">Minimum number of credits required</th></tr>
<tr><th colspan="2">Eligibility for undergraduate major affiliation</th><th>Eligibility for independent research project for the Bachelor's Degree</th><th>Eligibility for graduation</th></tr>
<tr><td>Humanities and social science courses</td><td>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)</td><td rowspan="3">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)</td><td>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</td><td>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</td></tr>
<tr><td>English language courses</td><td>A total of 4 credits in 100-level required courses</td><td>6 credits
・4 credits in 100-level required courses
・2 credits in 200-level and 300-level required courses</td><td>9 credits
・4 credits in 100-level required courses
・4 credits in 200-level required courses
・2 credits in 300-level required courses</td></tr>
<tr><td>Basic science and technology courses</td><td>A total of 14 credits in 100-level required courses</td><td>14 credits
・14 credits in 100-level required courses</td><td>14 credits
・14 credits in 100-level required courses</td></tr>
<tr><td>Second foreign language courses</td><td colspan="2">—</td><td>2 credits
・200-level and 300-level restricted elective courses</td><td>4 credits
・200-level and 300-level restricted elective courses
* Either take the 200-level Basic Course 1, Basic Course 2, Basic Course 3, and Basic Course 4 in one of German, French, Russian, or Chinese language, or take 200-level Basic Course 1 and Basic Course 2 in one of German, French, Russian, or Chinese language and Basic Course 1 and Basic Course 2 in one other language (or 300-level courses 1 and 2 in one of Italian, Korean, and Spanish).</td></tr>
</table>

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 the Bachelor's Degree
Other major courses	—	Determined for each standard study program	Determined for each standard study program
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 * There are undergraduate majors that set up requirements for more than 110 credits, so please refer to the standard study program for the undergraduate major concerned.	124 credits or more that satisfy the above requirements * There are undergraduate majors that set up requirements for more than 124 credits, so please refer to the standard study program for the undergraduate major concerned.

Note: Courses that are not included in the number of credits necessary to be eligible for the independent research project for the Bachelor's Degree (110 credits or more) or in the number of credits required for graduation (124 credits or more): Teacher training courses

Table 3. Overview of numbers of required credits prescribed by standard study programs 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 Study Program Guide (pp. 68–171), so please be certain to refer to the Standard Study Program Guide for the undergraduate major concerned. Please pay close attention since there are some undergraduate majors that set the number of credits required for eligibility for graduation at more than 124 credits.

Standard study program	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 an undergraduate major 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 an undergraduate major 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 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 (2 Research Opportunity Project, including 6 Special Topic Research), ○ 14)
Undergraduate major in Systems and Control Engineering	60 (◎ 3, ○ 13 credits excluding Research Opportunity Project, Research Opportunity Project 2 courses)	60 (◎ 9 (including 6 Special Topic Research), ○ 13 credits excluding Research Opportunity Project, Research Opportunity Project 2 courses)
Undergraduate major in Electrical and Electronic Engineering	53 (including 27 ◎ (Research Opportunity Project 2))	65 (◎ 37 (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	46 (2 Research Opportunity Project, ○ 30	70 (2 Research Opportunity Project, 6

Industrial Engineering and Economics	(excluding independent project courses))	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 ○, total 111 credits or more	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, total of 128 credits or more
Undergraduate major in Chemical Science and Engineering	46 (21 ◎ (including 2 Research Opportunity Project))	56 (27 ◎ (including 2 Research Opportunity Project, 6 Special Topic Research), 4 ○ (same major 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 (30 from 200-level (including 12 ◎, 8 ○), 2 Research Opportunity Project)	64 (30 from 200-level (including 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	54 (10 ◎ (including 2 Research Opportunity Project), 12 ○)	68 (20 ◎ (including 2 Research Opportunity Project, 6 Special Topic Research), 18 ○)
Undergraduate major in Transdisciplinary Science and Engineering	54 (28 ◎, 2 Research Opportunity Project)	60 (30 ◎, 2 Research Opportunity Project, 6 Special Topic Research)

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

This table presents numbers of required courses and restricted elective courses by term 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 term and quarter study plans on these tables.

	1st year				2nd Year				3rd year				4th year				Total
	Spring Term		Fall Term		Spring Term		Fall Term		Spring Term		Fall Term		Spring Term		Fall Term		
	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 term of second year or spring term of third year

(*6) Take in spring term (1Q) or fall term (3Q or 4Q) of third year

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 study program 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, and so on. 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 term 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 term of that same year. Credits for courses that do not meet graduation requirements (such as teacher training courses) are not counted toward the upper limit on number of credits.

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 study program for each undergraduate major.

Application for registration

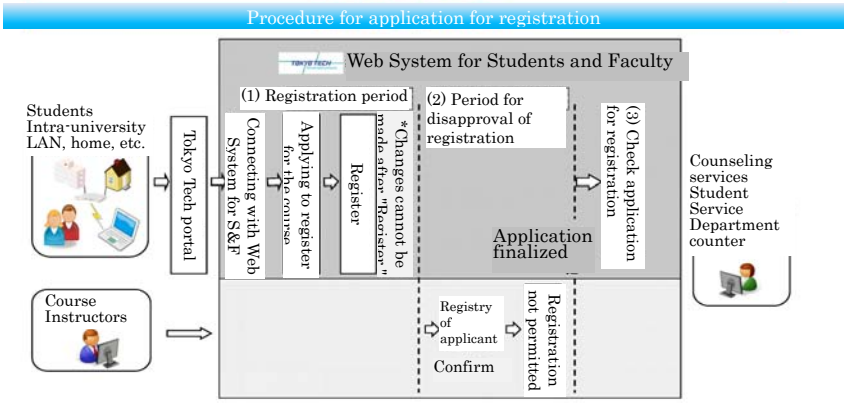
In order to earn course credits, you must obtain permission by applying to register for the course (submit an application for registration) within the determined period of time using the Web System for Students and Faculty.

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 term, 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 term or the start of the fall term (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: When the period for disapproval of registration has ended, you will be notified by e-mail when your applications have been finalized, so please check the courses that you have applied to register for. Please take great care, because the procedures relating to application for registration do not allow withdrawal or addition after a certain time.

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 an added course after the period for application for registration has ended, you must follow the procedure for application for added course and obtain permission from the instructor of the course 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 five times. (The specific date will be shown in 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

In the case of intensive lecture courses, the deadline for application for added course and for withdrawal of application will be the date of the last class in that course, regardless of above items 3) and 4). Please take care because the deadline for an intensive lecture course that is held during the usual period for the schedule of courses may be earlier than the deadline for an ordinary course.

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 term (spring term and fall term), 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. 197).

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 and so on. For details, please refer to Arrangement of Guidance on Learning for Underachieving Students in the Tokyo Institute of Technology Bachelor's Degree Program (p. 203). This will not apply in the case of a leave of absence or other such circumstance.

・All students

Students who did not submit an application for registration during the term in question (meaning the spring term or the fall term).

・Students who are affiliated with an academic group and to whom any of the following apply

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

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

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

・Students who are affiliated with an undergraduate major 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 terms in which they earned fewer than 15 credits

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

3) Students who became affiliated with an undergraduate major 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 the Bachelor's Degree but who have not graduated

(5) GPA and GPT

GPA (grade point average)

For students entering Tokyo Tech from the 2016 academic year, we have introduced a system that uses the GPA as an index for objective evaluation of the status and results of their study. The purpose of the GPA system is to provide an evaluation of learning that has rigor and transparency in order to facilitate active learning by students and on-target learning guidance by faculty members, etc., and so to contribute to a higher quality of education. The GPA is recorded in the academic transcript and in academic work and grade reports. It is also used as a criterion for aggregating the upper limit on the number of credits in application for registration and as a benchmark for students subject to learning guidance. The Web System for Students and Faculty shows the cumulative GPA for the period of enrollment, and also shows the GPA by academic year, by term, and by quarter.

Courses that do not count toward graduation requirements (such as teacher training courses), research-related courses (research opportunity courses, independent research projects for the Bachelor's Degree, advanced independent research project for the Bachelor's Degree), courses that are graded on a pass/fail basis, and courses with credits recognized by special arrangement do not count toward the GPA.

Moreover, when students have earned credit by retaking a course in which they received a failing grade, the failing grade they received in that course will be excluded from calculation of their cumulative GPA, and the passing grade they received from retaking the course will be used to correct the cumulative GPA.

The formulas used to calculate the GPA 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.

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

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

$$\text{Academic year GPA} = \frac{\text{Total of (number of credits} \times \text{grade points in courses applied for and taken during the academic year in question)}}{\text{Total of (number of credits in courses applied for and taken during the academic year in question)}}$$

$$\text{Term GPA} = \frac{\text{Total of (number of credits} \times \text{grade points in courses applied for and taken during the term in question)}}{\text{Total of (number of credits in courses applied for and taken during the term in question)}}$$

$$\text{Quarter GPA} = \frac{\text{Total of (number of credits} \times \text{grade points in courses applied for and taken during the quarter in question)}}{\text{Total of (number of credits in courses applied for and taken during the quarter in question)}}$$

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 training 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, and OCW-i

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

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 is 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, and so on.

You can log in from the Tokyo Tech portal website (http://portal.titech.ac.jp/) to use the Web System for Students and Faculty and OCW-i.

(7) Academic advisers

From the time of admission, students at Tokyo Tech will have two academic advisers 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, and so on. New academic advisers may take over when students become affiliated with an undergraduate major, when they start an independent research project for a Bachelor's Degree, or at other such junctures.

(8) Learning concierge

The learning concierge explains 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 provides information about arrangements for learning. The concierge will handle group interviews, seminars, consultations, and so on. In this way, the concierge can help you resolve the questions and problems you initially face at admission, and help you gain a firm grasp of the study skills of a university student.

(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 and so on. Your academic advisers check the portfolio, enter comments, and so on, 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 affiliated with an academic group, this is done in October every year; for students who are affiliated with an undergraduate major, 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. 199).

(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 an undergraduate major, 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.

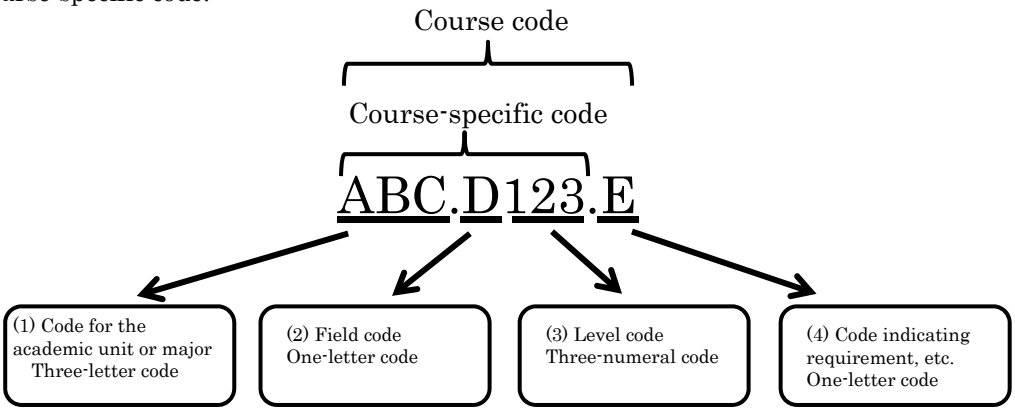
2. Course codes

1. What are course codes?

Course codes are numbers assigned to courses to indicate their academic field and their level of difficulty. These numbers are assigned to all courses. Using course codes can help you set up a more systematic course registration plan.

2. Course code configuration

Course codes are configured from the following four types of code. The part composed of code elements (1) to (3) is called the course-specific code.



(1) Code for the academic unit or major

This shows the undergraduate major (in graduate school, the graduate major) that sets up the course (the academic unit or major) or the course category in the liberal arts course group.

* See Table 5 and Table 6

(2) Field code

This shows the field of the course within the academic unit or major. The field code is determined in each undergraduate major or graduate major, so for details, please refer to the pages with the standard study program for the undergraduate major concerned.

(3) Level code

At Tokyo Tech, the level of a course is indicated by the hundreds place.

* The last two digits basically indicate basic courses by the numbers 01 to 29, and practical and advanced courses by the numbers 30 and up. However, higher numbers do not necessarily indicate higher-level courses.

Course level	Capabilities that students acquire	Intended for
100-level Introductory and basic courses	◎ Acquire knowledge and develop awareness necessary for Tokyo Tech students regardless of their academic group or school.	Bachelor's Degree program
200-level Foundation courses	◎Acquire the basic knowledge, accomplishments, and linguistic ability necessary for the school of the specialization or the undergraduate major. ◎Acquire conceptual and creative capabilities founded on specialized knowledge. ◎(+) Comprehend the connections among required courses and acquire English-language understanding of specialized knowledge.	

300-level Advanced courses	◎Acquire the knowledge, accomplishments, linguistic ability, and expressive ability necessary for the school of the specialization or the undergraduate major. ◎Acquire knowledge in fields peripheral to the major and in other specialized fields. ◎(+) In addition to the major field, acquire systematic foundation and specialized knowledge in a minor field.	
400-level Advanced courses	◎Acquire deep knowledge of the major field in English. ◎Acquire the accomplishments of a graduate student.	Master's Degree program, Professional degree program
500-level Independent courses	◎Acquire deep knowledge in English of fields peripheral to the major and of other specialized fields. ◎(+) In addition to the major field, acquire systematic specialized knowledge in a minor field.	
600-level Master courses	◎Acquire the capabilities to deal with the cutting-edge in the major field, to pursue research, and to present and disseminate the results globally. ◎Acquire the capability to discover issues.	Doctoral second-stage program

(4) Code indicating requirement, etc.

This code indicates the category of the course as a requirement, restricted elective, or elective for students affiliated with the undergraduate major, graduate major, or other unit indicated by the academic unit or major code.

Code	Meaning
R	Required course
A–K	Restricted elective course
L	Elective course
Z	Course in other undergraduate major or graduate major

3. Recommended course codes

Course codes convey information for students in the undergraduate major, graduate major, or other such unit indicated by the code for the academic unit or major. There are times when a course is also a recommended course for students in another undergraduate major or graduate major. The code attached by an undergraduate major or graduate major other than the academic unit or major offering the course is the recommended course code. The configuration of recommended course codes is the same as for course codes.

Example: When a course (Introduction to XXX) offered in undergraduate major "A" is also recommended in undergraduate major "B"

The course code for Introduction to XXX will be AAA.X111.R. At the same time, however, the recommended course code in undergraduate major "B" will be something like BBB.Y125.E.

* A recommended course code should be presented in the format "recommended course code (course-specific code)" so that it is always shown together with the course-specific code. Example: BBB.Y125.E (AAA.X111).

Table 5. Code for the academic unit or major (major course group)

School	Undergraduate major, etc.	Academic unit or major Code
School of Science	Undergraduate major in Mathematics	MTH

Table 6. Code for the academic unit, major, etc. (liberal arts courses group)

Courses category	Academic unit or major Code	Course subcategory	Field Code
Humanities and social science courses	LAH	——	

	Undergraduate major in Physics	PHY	English language courses	LAE	——	
	Undergraduate major in Chemistry	CHM	Second foreign language courses	LAL	——	
	Undergraduate major in Earth and Planetary Sciences	EPS	Japanese language and culture courses	LAJ	——	
School of Engineering	Undergraduate major in Mechanical Engineering	MEC	Teacher training 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	CVE			Frontiers of science	F

	major in Civil and Environmental Engineering	
	Undergraduate major in Transdisciplinary Science and Engineering	TSE
	Undergraduate major in Social and Human Sciences	SHS
Academic group courses Creative process courses	First Academic Group	GRA
	Second Academic Group	GRB
	Third Academic Group	GRC
	Fourth Academic Group	GRD
	Fifth Academic Group	GRE
	Sixth Academic Group	GRF
	Seventh Academic Group	GRG
Common courses		XCO※

		and technology courses	
		Creativity development courses	R

* There are some courses that differ.

3. Study programs

Study program

Students who are affiliated with an undergraduate major set up study plans of their own, while also receiving guidance from their academic advisers and others, and take courses according to their plans. Every undergraduate major provides what is called a standard study program 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 study program.

Cases that follow the standard study program

The standard study program covers standard content that students should learn so they will be able to function in the world as researchers, engineers, and so on 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 study programs for every undergraduate major.

Details of each standard study program 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 undergraduate major chair, your academic advisers, and so on.

Cases that do not follow the standard study program

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

In these cases, when students become affiliated with an undergraduate major, at the same time they should also create a written plan with courses that correspond to those in the standard study program. They must receive the approval of the chair of their affiliated undergraduate major 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 Ookayama Student Division or the Suzukakedai Student Division.

This plan will cover the entire period from undergraduate major 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 study program 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.

Table 10. Standard study programs for every undergraduate major

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

4. Global Scientists and Engineers Course

In academic year 2012, the Tokyo Tech program was selected for the FY2012 Project for Promotion of Global Human Resource Development, Type B (faculty/school specific) under the Ministry of Education, Culture, Sports, Science and Technology.

The Project for Promotion of Global Human Resource Development (from fiscal year 2014, reorganized as the Go Global Japan Project of the Top Global University Project) is an initiative to promote the globalization of university education a step toward the development of human resources capable of actively taking on the challenges of activity in a global arena, thereby providing a foundation for improving Japanese international industrial competitiveness and strengthening the ties between nations.

Tokyo Tech has established the Global Scientists and Engineers Course as a new Bachelor's Degree program that is aimed at developing human resources capable of contributing to scientific and technical development in newly emerging countries. The objective is to have approximately 10% (about 120 students) of the annual undergraduate Bachelor's Degree program admissions capacity complete this course. In addition to education in specialist skills, therefore, we provide education under the following four programs in the course of the four-year Bachelor's Degree program.

1. Global Awareness Program

   The program fosters the ability to think in a multifaceted way from international perspectives and the motivation to engage in global activity.

2. English and Communication Program

   This program develops the English language proficiency and communication skills required to study at universities and other such institutions in other countries.

3. International Cooperation Practice Grounded in Science and Technology Program

   This program fosters the ability to cooperate across national and cultural differences, to perceive the essential reality of complex issues while taking constraining conditions into consideration, and to suggest measures for resolution.

4. Study Abroad or International Internship Program

   This program fosters the ability to engage in independent activity, including crisis management, in other countries on the foundation of the individual's own expertise. The program involves actual study or internship in other countries.

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

5. 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 term 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 (p. 201). If you are interested in applying for early graduation, please consult in advance with your academic advisers and undergraduate major 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. (See p. 27)

6. 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 major 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 major 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 Admission Division of the Suzukakedai Student Division.

If you are interested in applying for early admission, please consult in advance with your academic advisers and undergraduate major 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.

7. 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 an undergraduate major 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 completion	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	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 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 and Chemical Technology	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★		
School of Life Science and Technology and Chemical 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

8. 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 undergraduate major 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 Ookayama Student Division or the Suzukakedai Student Division.

Handling of students in a Tokyo Institute of Technology Bachelor's Degree program who take graduate school courses

Article 1 The handling provided for here is to be the handling prescribed in the case of students in a Bachelor's Degree program at the Tokyo Institute of Technology (hereafter referred to as Tokyo Tech) who wish to register for and take graduate school courses.

Article 2 The students who are eligible to request registration in such courses are to be students who have received permission to take an independent research project for the Bachelor's Degree or students who have been informally accepted for admission to a graduate school at Tokyo Tech and who have been recommended by the chair of the undergraduate major with which they are affiliated.

Article 3 Students specified in the preceding article who are currently enrolled in a Bachelor's Degree program, and who have received the permission of the chair of the undergraduate major with which they are affiliated, their academic adviser, and the instructor of the course are to be permitted to register in courses with 400-level course codes (excluding humanities and social science courses, career development courses, and research seminars) for a maximum of 10 credits in total.

Article 4 Credits in such a course will not be recognized as credits in the Bachelor's Degree program even if the evaluation of learning for the course results in a passing grade. However, it is possible for credits in such a course to be recognized as credits in a graduate school program if the student is admitted to graduate school, the student submits an application for registration for the course when it is offered, and the student also submits the prescribed form for the purpose.

Supplementary Provisions

1. This handling is to be implemented from April 1, 2016.
2. As regards those students who are currently enrolled at Tokyo Tech on March 31, 2016 (including those who are to be admitted to the School of Science, the School of Engineering, or the School of Bioscience and Biotechnology by readmission, by transfer from another institution at the same level, or by transfer from another institution of a lower level on or after April 1, 2016), the application of amended regulations for the handling of students in a Tokyo Institute of Technology Bachelor's Degree program who take graduate school courses will reinterpret the reference to "independent research project for the Bachelor's Degree" in Article 2 to read "Bachelor's Degree thesis research," and the references to "the chair of the undergraduate major with which they [the students] are affiliated" in Article 2 and Article 3 to read "the head of the department with which they [the students] are affiliated."

Course

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	Philosophy A Communication A Special Lecture: Language and Introduction to Foreign Languages 1 Special Lecture: Writing Skills	Law (Constitutional Law) A International Relations A Sociology A Journalism A	Statistics A Science and Technology for Society A Decision Making A
	3Q	Mon	5, 6	Art A History A Special Lecture: Social and Cultural Introduction to Foreign Languages 2 Special Lecture: Writing Skills	Law (Civil Law) A Psychology A Contemporary Society A	History of Science A Ethics in Engineering A Social Modeling A
	4Q	Mon	5, 6	Cultural Anthropology A Literature A Religion A Special Lecture: Writing Skills	Political Science A Pedagogy A Economics A	History of Technology A Philosophy of Science A Linguistics A
200	1Q	Tue & Fri	5, 6	Philosophy B History B Intercultural Studies: Asia and Africa Special Lecture: Introduction to Opera	Contemporary Society B Journalism B Pedagogy B	Special Lecture: History of Science and Technology for Society B Decision Making B
	2Q	Mon & Thu	1, 2	Arts B, Esthetics B Religion B Intercultural Studies: Europe and	Law (Constitutional Law) B Political Science B Sociology B	Statistics B Ethics in Engineering B Linguistics B Special Lecture: Physical Activity
	3Q	Mon & Thu	1, 2	Literature B Cultural Anthropology B Communication B World Literature 1	International Relations B	History of Science B Philosophy of Science B
	4Q	Mon & Thu	1, 2	World Literature 2	Law (Civil Law) B Psychology B Economics B	History of Technology B Social Modeling B
300	1Q	Tue & Fri	7, 8	Philosophy C Arts C, Esthetics C Religion C Special Lecture: Intellectual History Special Lecture: Music	Law (Constitutional Law) C Political Science C Pedagogy C Sociology C	History of Science C Ethics in Engineering C Philosophy of Science C Social Modeling C Linguistics C Special Lecture: Text Hermeneutics Special Lecture: Sports Science
	2Q	Mon & Thu	3, 4			Science and Technology for Society C Decision Making C Special Lecture: Cities
	3Q	Mon & Thu	3, 4	Liberal Arts Final Report		
				Special Lecture: Gender	International Relations C Contemporary Society C Economics C	
		Mon & Thu	5, 6	Cultural Anthropology C	Law (Intellectual Property Law) C Psychology C Special Lecture: Media Psychology	History of Technology C Special Lecture: Human Relations
	4Q	Mon & Thu	3, 4	Liberal Arts Final Report		
				History C Literature C	Law (Civil Procedure Law) C	Statistics C Special Lecture: Medical Care
		Mon & Thu	5, 6			Special Lecture: Environment

Seminar

200	1Q–4Q	(Self-discovery, social-cultural-human exploration session) 1–6	(Japanese Law Study Seminar) 1–6	(Decision making) 1–6
300				(Society and science and technology in history) 1–6
		(Facilitating dialogue, collaboration, and bliss) 1–6	(Sociology of media and governance) 1–6	(Scientific studies on "well-being" and positive education)
		(Art workshop) 1–6		1–6
		(Religion and spirituality in contemporary society) 1–6		

9. Guide to courses in humanities and social science

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)

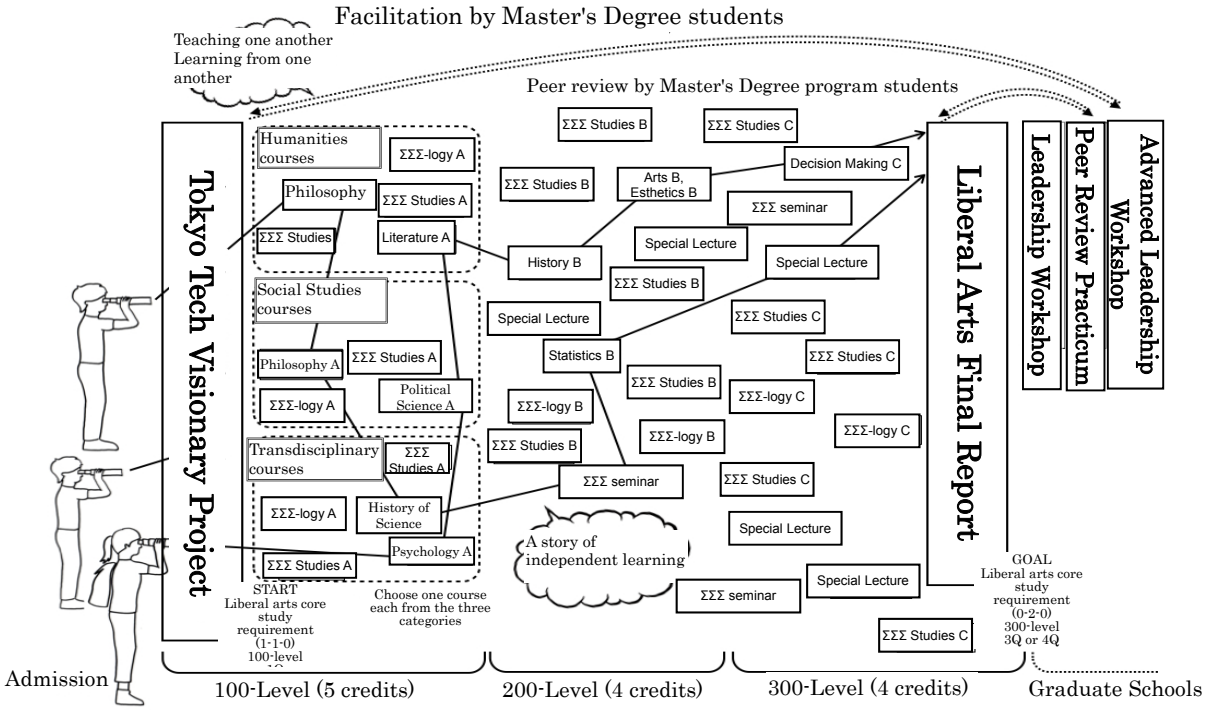
These are courses that make up the core of liberal arts education at Tokyo Tech. From the first year in a school up to the Doctoral program, such courses are largely offered in alternate years so that they will be a consistent, continuing presence throughout the liberal arts education. Courses of this 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. 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, from ΣΣΣ 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 term (1Q and 2Q or 3Q and 4Q). Also, a single seminar is made up of six courses so that students can repeat the same seminar over a three-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: 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

Course

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	Philosophy A Communication A Special Lecture: Language and Culture Introduction to Foreign Languages 1 Special Lecture: Writing Skills	Law (Constitutional Law) A International Relations A Sociology A Journalism A	Statistics A Science and Technology for Society A Decision Making A
	3Q	Mon	5, 6	Art A History A Special Lecture: Social and Cultural Introduction to Foreign Languages 2 Special Lecture: Writing Skills	Law (Civil Law) A Psychology A Contemporary Society A	History of Science A Ethics in Engineering A Social Modeling A
	4Q	Mon	5, 6	Cultural Anthropology A Literature A Religion A Special Lecture: Writing Skills	Political Science A Pedagogy A Economics A	History of Technology A Philosophy of Science A Linguistics A
200	1Q	Tue & Fri	5, 6	Philosophy B History B Intercultural Studies: Asia and Africa Special Lecture: Introduction to Opera	Contemporary Society B Journalism B Pedagogy B	Special Lecture: History of Universities Science and Technology for Society B Decision Making B
	2Q	Mon & Thu	1, 2	Arts B, Esthetics B Religion B Intercultural Studies: Europe and Latin	Law (Constitutional Law) B Political Science B Sociology B	Statistics B Ethics in Engineering B Linguistics B Special Lecture: Physical Activity
	3Q	Mon & Thu	1, 2	Literature B Cultural Anthropology B Communication B World Literature 1	International Relations B	History of Science B Philosophy of Science B
	4Q	Mon & Thu	1, 2	World Literature 2	Law (Civil Law) B Psychology B Economics B	History of Technology B Social Modeling B
300	1Q	Tue & Fri	7, 8	Philosophy C Arts C, Esthetics C Religion C Special Lecture: Intellectual History in Special Lecture: Music	Law (Constitutional Law) C Political Science C Pedagogy C Sociology C	History of Science C Ethics in Engineering C Philosophy of Science C Social Modeling C Linguistics C Special Lecture: Text Hermeneutics Special Lecture: Sports Science
	2Q	Mon & Thu	3, 4			Science and Technology for Society C Decision Making C Special Lecture: Cities
	3Q	Mon & Thu	3, 4	Liberal Arts Final Report		
				Special Lecture: Gender	International Relations C Contemporary Society C Economics C	
		Mon & Thu	5, 6	Cultural Anthropology C	Law (Intellectual Property Law) C Psychology C Special Lecture: Media Psychology	History of Technology C Special Lecture: Human Relations
	4Q	Mon & Thu	3, 4	Liberal Arts Final Report		
				History C Literature C	Law (Civil Procedure Law) C	Statistics C Special Lecture: Medical Care
		Mon & Thu	5, 6			Special Lecture: Environment

Seminar

200	1Q–4Q	(Self-discovery, social-cultural-human exploration session) 1–6	(Japanese Law Study Seminar) 1–6	(Decision making) 1–6
300				(Society and science and technology in history) 1–6
		(Facilitating dialogue, collaboration, and bliss) 1–6	(Sociology of media and governance) 1–6	(Scientific studies on "well-being" and positive education)
		(Art workshop) 1–6		1–6
		(Religion and spirituality in contemporary society) 1–6		

10. Guide to taking 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 term or fall term and one listening and speaking class in the spring term or fall term. (They will either be assigned to the combination of reading and writing class in the spring term and listening and speaking class in the fall term, or the combination of listening and speaking class in the spring term and reading and writing class in the fall term. 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 the university in the 3rd year of admission, or in the public TOEFL iBT, TOEFL ITP, or TOEIC tests that students can take individually in the 3rd 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 code (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 terms, and they must receive permission to take the exam. One of two grades is possible, either pass (uniformly 60 points) or fail.

If students are unable to take English 9 in the recommended quarter, they must reapply for it in the following quarter or later. When retaking English 9, the determination of student grades will also include class evaluations (including final exams and so on). Students should reapply for the course and retake it in the 4th quarter of the 4th year of admission or later. Students who fail may be subject to 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 term. 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 public test	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 an undergraduate major 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 code (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)
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	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
	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
	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
	Scientific Technical English Study Abroad Practicum	0-2-0	2Q

11. Guide to taking second foreign language courses

Second foreign languages include German, French, Russian, and Chinese, which can be taken from the 200-level, and Italian, Korean, and Spanish, which can be taken from the 300-level, for a total of seven languages. (To be taken in or after the second year after admission)

Required courses include 4 credits in a Basic Course.

All students will first choose one from among the four 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.

Elective courses further include the following courses.

1. Intermediate and advanced levels

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

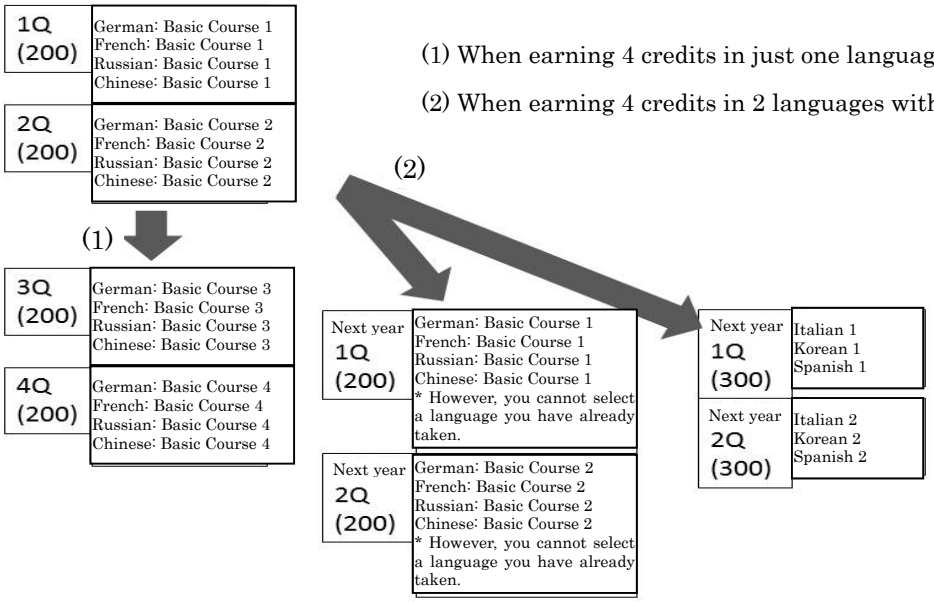
2. Conversation (Basic Course) and Conversation (Advanced Course)

Take German, French, 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 the 1Q and 2Q, or in the 3Q and 4Q, to earn the 2 credits.

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

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

Flowchart of 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

Elective second foreign language courses

Course code (course level)	Language	Course		Number of credits	Recommended time to take course
300-level	German	German: Intermediate Course 1 and 2		0-1-0 / 0-1-0	It is desirable for students to take these courses in sequence in successive quarters, either 1Q and 2Q or 3Q and 4Q.
		German: Intermediate Course 3 and 4		0-1-0 / 0-1-0	
		German: Advanced Course 1 and 2		0-1-0 / 0-1-0	
		German: Advanced Course 3 and 4		0-1-0 / 0-1-0	
		German Conversation (Basic Course)	1 and 2	0-1-0 / 0-1-0	
		German Conversation (Basic Course)	3 and 4	0-1-0 / 0-1-0	
		German Conversation (Advanced Course)	1 and 2	0-1-0 / 0-1-0	
		German Conversation (Advanced Course)	3 and 4	0-1-0 / 0-1-0	
300-level	French	French: Intermediate Course 1 and 2		0-1-0 / 0-1-0	It is desirable for students to take these courses in sequence in successive quarters, either 1Q and 2Q or 3Q and 4Q.
		French: Intermediate Course 3 and 4		0-1-0 / 0-1-0	
		French: Advanced Course 1 and 2		0-1-0 / 0-1-0	
		French: Advanced Course 3 and 4*		0-1-0 / 0-1-0	
		French Conversation (Basic Course)	1 and 2	0-1-0 / 0-1-0	
		French Conversation (Basic Course)	3 and 4	0-1-0 / 0-1-0	
		French Conversation (Advanced Course)	1 and 2	0-1-0 / 0-1-0	
		French Conversation (Advanced Course)	3 and 4	0-1-0 / 0-1-0	
300-level	Russian	Russian: Intermediate Course 1 and 2		0-1-0 / 0-1-0	It is desirable for students to take these courses in sequence in successive quarters, either 1Q and 2Q or 3Q and 4Q.
		Russian: Intermediate Course 3 and 4		0-1-0 / 0-1-0	
		Russian: Advanced Course 1 and 2		0-1-0 / 0-1-0	
		Russian: Advanced Course 3 and 4		0-1-0 / 0-1-0	
		Russian Conversation (Basic Course)	1 and 2	0-1-0 / 0-1-0	
		Russian Conversation (Basic Course)	3 and 4	0-1-0 / 0-1-0	
		Russian Conversation (Advanced Course)	1 and 2	0-1-0 / 0-1-0	
		Russian Conversation (Advanced Course)	3 and 4	0-1-0 / 0-1-0	
300-level	Chinese	Chinese: Intermediate Course 1 and 2		0-1-0 / 0-1-0	It is desirable for students to take these courses in sequence in successive quarters, either 1Q and 2Q or 3Q and 4Q.
		Chinese: Intermediate Course 3 and 4		0-1-0 / 0-1-0	
		Chinese: Advanced Course 1 and 2		0-1-0 / 0-1-0	
		Chinese: Advanced Course 3 and 4		0-1-0 / 0-1-0	
		Chinese Conversation (Basic Course)	1 and 2	0-1-0 / 0-1-0	
		Chinese Conversation (Basic Course)	3 and 4	0-1-0 / 0-1-0	
		Chinese Conversation (Advanced Course)	1 and 2	0-1-0 / 0-1-0	
		Chinese Conversation (Advanced Course)	3 and 4	0-1-0 / 0-1-0	
300-level		Italian 3 and 4*		0-1-0 / 0-1-0	It is desirable for students to take these courses in sequence in successive quarters (3Q and 4Q).
300-level		Korean 3 and 4*		0-1-0 / 0-1-0	
300-level		Spanish 3 and 4*		0-1-0 / 0-1-0	

*This course is not offered in the 2016 academic year.

12. Guide to taking 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 undergraduate major, 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 of credits	Quarter when offered	Remarks
Calculus I / Recitation	1-1-0	1Q, 2Q	Required course
Linear Algebra I / Recitation	1-1-0	1Q, 2Q	Required course
Calculus II	2-0-0	3Q, 4Q	
Calculus Recitation II	0-1-0	3Q, 4Q	
Linear Algebra II	2-0-0	3Q, 4Q	
Linear Algebra Recitation II	0-1-0	3Q, 4Q	

Points for attention in taking courses

Calculus II and Calculus Recitation II are to be taken simultaneously.

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 of credits	Quarter when offered	Remarks
Fundamentals of Mechanics 1	1-0-0	1Q	Required course
Fundamentals of Mechanics 2	1-0-0	2Q	Required course
Fundamentals of Electromagnetism 1	1-0-0	3Q	Required course
Fundamentals of Electromagnetism 2	1-0-0	4Q	Required course
Exercises in Physics I	0-1-0	1Q–2Q	
Exercises in Physics II	0-1-0	3Q-4Q	
Experiments in Physics I	0-0-1	1Q–2Q	
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 these courses in the 1Q and 3Q, so students wishing to take these courses should make sure to attend these sessions.

Exercises in Physics I and Experiments in Physics I are offered for 1 credit through the 1Q and 2Q, so neither course can be taken for just one of those quarters. Similarly, Exercises in Physics II and Experiments in Physics II are offered for 1 credit through the 3Q and 4Q, so neither course can be taken for just one of those quarters.

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. The conceptual approaches and knowledge acquired in these courses provide fundamental ways of thinking and information relating to matter and materials not only for undergraduate majors in Chemistry or undergraduate majors in Chemical Science and Engineering, but also for students pursuing other undergraduate majors. In the laboratory courses, students acquire the basics needed for experimentation, including the knowledge and skills for working with chemicals and laboratory equipment. A further purpose is to provide a deeper understanding of the content of chemistry lectures by means of exercises and hands-on experience.

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 of credits	Quarter when offered	Remarks
Basic Inorganic Chemistry	1-0-0	1Q, 2Q	Required course
Basic Organic Chemistry	1-0-0	1Q, 2Q	Required course
Basic Quantum Chemistry	1-0-0	3Q, 4Q	Required course
Basic Chemical Thermodynamics	1-0-0	3Q, 4Q	Required course
Chemistry Laboratory I	0-0.5-1.5	1Q–2Q	
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: Six themes including synthesizing methyl orange, standard electrode potential, and molecular modeling

Chemistry Laboratory II: Six themes including absorption spectra, reaction rate constants, and chemistry of flavonoids

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. 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.

While it is desirable for students who take Chemistry Laboratory II to have already completed Chemistry Laboratory I, it is possible to take just Chemistry Laboratory II.

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	Prerequisite courses
LAS.B101	Fundamental Life Science 1-1	1-0-0	1Q	Required course	None
LAS.B102	Fundamental Life Science 1-2	1-0-0	2Q	Required course	LAS.B101
LAS.B103	Fundamental Life Science 2-1	1-0-0	3Q		LAS.B101 and LAS.B102
LAS.B104	Fundamental Life Science 2-2	1-0-0	4Q		LAS.B101 and LAS.B102
LAS.B105	Fundamental Life Science Laboratory	0-0-1	3Q-4Q		LAS.B101 and LAS.B102

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 academic groups 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 academic groups. 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 uses the Student Exercise Room on the 5th floor of Ookayama West Bldg. 3. Exercises are held eight times through the 3Q and 4Q together. Students cannot take the course just in the 3Q or just in the 4Q. Participants are divided into four classes, and the classes meet in alternating weeks to do laboratory work. You will need to check in advance to find out to which class 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 Seventh Academic Group (approximately 150 students) will be given priority.

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. The lecture courses mainly cover space and astronomy in Earth and Space Sciences A and the earth and the solar system in Earth and Space Sciences B. 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 of credits	Quarter when offered
Earth and Space Sciences A	2-0-0	1Q
Earth and Space Sciences B	2-0-0	3Q
Earth and Space Sciences, Laboratory and Field Studies (Geophysics)	0-0-1	2Q
Earth and Space Sciences, Laboratory and Field Studies (Earth Materials)	0-0-1	2Q
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 Second Academic Group and Sixth Academic Group 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.

・Descriptive Geometry・Graphic Science (recommended for the Fourth Academic Group in particular)

Descriptive Geometry・Graphic Science is composed of lectures for learning principles and exercises for deepening understanding.

Courses offered

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

Course	Number of credits	Quarter when offered
Descriptive Geometry・Graphic Science 1	0.5-0.5-0	3Q
Descriptive Geometry・Graphic Science 2	0.5-0.5-0	4Q
Descriptive Geometry・Graphic Science 3	0.5-0.5-0	1Q (200-level for the second year)
Descriptive Geometry・Graphic Science 4	0.5-0.5-0	2Q (200-level for the second year)
Descriptive Geometry for Space Design 1	1-1-0	1Q–2Q
Descriptive Geometry for Space Design 2	1-1-0	3Q–4Q
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 90 minutes) per week.

Course	Number of credits	Quarter when offered
Information Literacy I	0.5-0.5-0	1Q
Information Literacy II	0.5-0.5-0	2Q
Computer Science I	0.5-0.5-0	3Q
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 do not log in to the Tokyo Tech portal until you receive instructions in this class.
- Please come to the class with your student ID card and your password written down on paper. These are essential for exercises in the class.
- The Computer Science classes have different organization and composition than the Information Literacy classes. Student assignment to classes and the location of the first class session will be announced before the start of the third quarter on campus bulletin boards, the Computer Science course page on the university's educational website, and so on.
- 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 of credits	Quarter when offered
Environment and Safety	1-0-0	1Q, 2Q

Points for attention in taking courses

Only one 100-level environmental education course is offered. It is **Environment and Safety**. This course is offered in four classes (A, B, C, and D) each in the first and second quarters. The quarter and class in which the course can be taken in unit classes are different. It is preferable for students to take this course as early in their enrollment as possible so they can acquire the mindset for conducting laboratory work.

9. Frontiers of science and technology

The supervising faculty for the First through Seventh Academic Groups 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. It is the only course that introduces an organized selection of leading-edge science and technology to the First to Seventh Academic Groups, and as such, the content of this course provides valuable points of entry to specialized learning.

This course is held in the Tokyo Tech Lecture Theatre.

The students are divided into four groups, and the students in each group attend, in order, all the lectures arranged by the First to Seventh Academic Groups. A part of the course is also arranged to be held in English.

Courses offered

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

Course	Number of credits	Quarter when offered
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 academic groups, undergraduate majors, and so on. Details can be found in item 24 (Guide to creativity development courses; see p. 175).

Courses offered

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

Course	Number of credits	Quarter when offered
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 term 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. Attendance at the intensive lecture is essential for this purpose.

13. 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). They can be taken at any point in a program, regardless of the academic year. 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
- 200-level: (4) Advanced Wellness Exercise; (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	1Q, 2Q	Advanced Wellness Exercise
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 one credit.

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

・Exercise courses

1) Classes meet only once per week in a quarter, amounting to only 0.5 credits, and credit has not been recognized.

2) Therefore we basically recommend that you take the course in two successive quarters (1Q and 2Q, or 3Q and 4Q), going to the class once each week, and so earning one 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 one credit. Students wishing to attend class irregularly must consult in advance with the instructor.

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

4) There are intensive classes held off campus apart from the exercises held on campus. For intensive courses,

students can earn one credit for one category of class attended.

5) 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.

6) The exercise and sports categories offered are shown in the syllabus.
(In academic year 2016: Tennis, badminton, soccer, basketball, table tennis, physical training, 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 15 weeks	Q1, Q2, Q3, Q4
		Advanced Wellness Exercise	0-0-1	Basic configuration is one class per week in the 2:00 class period for 15 weeks	Q1, Q2
		Advanced Sports Exercise	0-0-1	Basic configuration is one class per week in the 2:00 class period for 15 weeks	Q3, Q4
		Total Wellness Exercise	0-0-1	Basic configuration is one class per week in the 2:00 class period for 15 weeks	Q1, Q2, Q3, Q4
	Laboratory	Laboratory of Health Science	0-1-0	One class per week in the 2:00 class period for eight weeks	Q3, Q4
	Lecture	Health Science	1-0-0	One class per week in the 2:00 class period for eight weeks	Q1, Q2

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 are different from you.

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 (GGJ) are also included. The 100-level GGJ course fosters the ability to think in a multifaceted manner from international perspectives and the motivation to engage in global activity. The 300-level GGJ 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 code (course level)	Course name	Credits	Quarter when offered	Remarks
100	Introductory Course for Global Scientists and Engineers	1-1-0	4Q	GGJ courses
200	Advanced Course for Global Scientists and Engineers	1-1-0	3Q, 3Q to 4Q	GGJ courses
100	Introduction to Overseas Training for Global Scientists and Engineers 1A	0-0-1	2Q	GGJ courses
100	Introduction to Overseas Training for Global Scientists and Engineers 1B	0-0-1	4Q	GGJ courses
100	Introduction to Overseas Training for Global Scientists and Engineers 1C	0-0-1	1Q-2Q	GGJ courses
100	Introduction to Overseas Training for Global Scientists and Engineers 1D	0-0-1	3Q-4Q	GGJ courses
100	Introduction to Overseas Training for Global Scientists and Engineers 2A	0-0-2	2Q	GGJ courses
100	Introduction to Overseas Training for Global Scientists and Engineers 2B	0-0-2	4Q	GGJ courses
100	Introduction to Overseas Training for Global Scientists and Engineers 2C	0-0-2	1Q-2Q	GGJ courses

100	Introduction to Overseas Training for Global Scientists and Engineers 2D	0-0-2	3Q-4Q	GGJ courses
100	Introduction to Overseas Training for Global Scientists and Engineers 3A	0-0-4	2Q	GGJ courses
100	Introduction to Overseas Training for Global Scientists and Engineers 3B	0-0-4	4Q	GGJ courses
100	Introduction to Overseas Training for Global Scientists and Engineers 3C	0-0-4	1Q-2Q	GGJ courses
100	Introduction to Overseas Training for Global Scientists and Engineers 3D	0-0-4	3Q-4Q	GGJ courses
200	Cultivating the Power of Execution through the Game of Go	1-1-0	3Q-4Q	GGJ courses
300	Overseas Training for Global Scientists and Engineers 1A	0-0-1	2Q	GGJ courses
300	Overseas Training for Global Scientists and Engineers 1B	0-0-1	4Q	GGJ courses
300	Overseas Training for Global Scientists and Engineers 1C	0-0-1	1Q-2Q	GGJ courses
300	Overseas Training for Global Scientists and Engineers 1D	0-0-1	3Q-4Q	GGJ courses
300	Overseas Training for Global Scientists and Engineers 2A	0-0-2	2Q	GGJ courses
300	Overseas Training for Global Scientists and Engineers 2B	0-0-2	4Q	GGJ courses
300	Overseas Training for Global Scientists and Engineers 2C	0-0-2	1Q-2Q	GGJ courses
300	Overseas Training for Global Scientists and Engineers 2D	0-0-2	3Q-4Q	GGJ courses

Course code (course level)	Course name	Credits	Quarter when offered	Remarks
300	Overseas Training for Global Scientists and Engineers 3A	0-0-4	2Q	GGJ courses
300	Overseas Training for Global Scientists and Engineers 3B	0-0-4	4Q	GGJ courses
300	Overseas Training for Global Scientists and Engineers 3C	0-0-4	1Q-2Q	GGJ courses
300	Overseas Training for Global Scientists and Engineers 3D	0-0-4	3Q-4Q	GGJ courses
300	Study Abroad program for international communication in Asia (Tokyo Tech-AYSEAS)	0-0-2	2Q	GGJ courses
300	Editorial Designing in the Media	0-2-0	4Q	GGJ courses
300	Science & Engineering Design for Global Talents - Overseas Programme	1-1-0	2Q	GGJ courses
300	Approaches to Creative Expression	0-1-0	2Q	GGJ courses
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	2Q	
300	Modern Japanese Architecture	1-0-0	2Q	
300	Topics on Japan I	1-0-0	4Q	GGJ courses
300	Topics on Japan II	1-0-0	2Q	GGJ courses

14. 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 11 credits in (1), (2), and (3) combined.

Japanese language and culture courses

Course code (course level)	Course	Number of credits	Quarter when offered
100	Japanese 1A	0-1-0	1Q
100	Japanese 1B	0-1-0	2Q
100	Japanese 2A	0-1-0	3Q
100	Japanese 2B	0-1-0	4Q
200	Japanese 3A	0-1-0	1Q
200	Japanese 3B	0-1-0	2Q
200	Japanese 4A	0-1-0	3Q
200	Japanese 4B	0-1-0	4Q
100	Japanese Culture: Adaptation	0-1-0	2Q
100	Japanese Culture: Society	0-1-0	3Q
100	Japanese Culture: Arts	0-1-0	4Q

15. Guide to academic group 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 academic group 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 academic group, 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 academic group, as shown below.

Course	Number of credits	Quarter when offered
Processes for creation in science and technology <1st>	1-0-0	2Q
Processes for creation in science and technology <2nd>	0.5-0.5-0	2Q
Processes for creation in science and technology <3rd>	1-0-0	2Q
Processes for creation in science and technology <4th>	0.5-0.5-0	2Q
Processes for creation in science and technology <5th>	1-0-0	2Q
Processes for creation in science and technology <6th>	1-0-0	2Q
Processes for creation in science and technology <7th>	1-0-0	2Q

Processes for creation in science and technology <First Academic Group>　1-0-0　2Q

This lecture course is held following the initial First Academic Group Student Exchange session, with the remaining six sessions divided into two rounds and the students divided into groups by the five undergraduate majors. These comprise the Mathematics undergraduate major, Physics undergraduate major, Chemistry undergraduate major, Earth and Planetary Sciences undergraduate major in the School of Science, and the undergraduate major in Mathematical and Computing Science in the School of Computing. 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 <Second Academic Group>　0.5-0.5-0　2Q

In this lecture course, students are divided into a number of sections, and they gain an understanding of how materials are used in the things around them by going through the process of dismantling the 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.

Processes for creation in science and technology <Third Academic Group>　1-0-0　2Q

Students who pursue a major course of study in Chemical Engineering, Applied Chemistry, Polymer Science, or Industrial Engineering and Economics will acquire the general concepts of chemistry and peripheral fields in that process. As engineers in those specializations, the students will also study the ethics that are essential to engineers. Each lecture is given by a professor who is a specialist in the field and introduces it from fundamentals to leading-edge research.

Processes for creation in science and technology <Fourth Academic Group>　0.5-0.5-0　2Q

This lecture course approaches the processes for creation in science and technology from two aspects, and teaches the substance related to each. The first relates to communication in science and technology, and covers methods for using graphics to convey to people the structure of a machine that cannot be explained by words. The second relates to the fundamentals of Industrial Engineering and Economics, which deal with the mechanisms by which the ideas and seeds for potential new technology are accepted in society and in the market.

Processes for creation in science and technology <Fifth Academic Group>　1-0-0　2Q

Students in this course primarily study the basic concepts of digital electronic systems. Digital radio equipment is used as an example, and the basic constituent technologies are surveyed. The subjects taken up include logic circuits, integrated circuits, computers, digital signal processors, digital modulators and demodulators, digital communications technology, and so on. The component elements of digital electronic systems, their principles of operation, their interrelationships, and other such matters are studied. The history of the development of these technologies is also touched on, to indicate the process by which digital electronic systems were created.

Processes for creation in science and technology <Sixth Academic Group>　1-0-0　2Q

This course deals with the *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).

Processes for creation in science and technology <Seventh Academic Group>　1-0-0　2Q

This course examines the green fluorescent protein (GFP) taken up in Frontiers of science and technology. 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.

Academic group courses

Academic group 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

Academic group courses are offered for each academic group, as follows.

<First Academic Group>

Course	Number of credits	Quarter when offered
1st Academic Group Literacy	1-0-0	1Q
1st Academic Group Basic Science I	1-0-0	2Q
1st Academic Group Basic Science II	1-0-0	3Q
1st Academic Group Basic Science III	1-0-0	4Q

First Academic Group course purpose, overview, etc.

The main purpose of the First Academic Group 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, and the Mathematical and Computing Science undergraduate major in the School of Computing. After newly admitted students take this course, it would be desirable for them to also take Processes for creation in science and technology <First Academic Group>, which is a course of similar intent, in the second quarter. First Academic Group Basic Science I to III provide introductory lectures in the fields concerned to students in three of the five undergraduate majors related to the First Academic Group. In academic year 2016, the first unit (I) will be the responsibility of the Mathematics undergraduate major, II of the Mathematical and Computing Science undergraduate major, and III of the Chemistry undergraduate major.

<Second Academic Group>

Course	Number of credits	Quarter when offered
Materials Science Seminar	1-0-0	1Q
Materials Science Literacy	0.5-0.5-0	2Q
Fundamentals of Materials Science A	1-0-0	3Q

Fundamentals of Materials Science B	1-0-0	4Q

Second Academic Group course purpose, overview, etc.

A number of different instructors discuss the latest topics in research in the Materials Science and Engineering undergraduate major fields and convey the appeal of materials research using specific actual examples. The class splits up into small groups that independently take up issues from the Materials Science and Engineering undergraduate major fields in the laboratory and learn about the properties of various materials in the process. At the same time, students also acquire a grounding in international awareness and ethics for scientists and engineers. Students study the fundamentals of the structure, distinctive properties, and manufacturing processes for metal materials, organic materials, and inorganic materials as background knowledge for taking 200-level and higher undergraduate major courses.

<Third Academic Group>

Course	Number of credits	Quarter when offered
Chemical Science and Engineering Literacy	1-0-0	1Q
Introduction to Applied Chemistry	1-0-0	2Q
Basic Chemical Engineering	1-0-0	3Q
Introduction to Polymer Chemistry	1-0-0	4Q

Third Academic Group course purpose, overview, etc.

In order to equip students to pursue their study of the engineering fields of chemical science and engineering, chemical engineering, and polymer science at university in an independent, motivated manner, these courses introduce the academic, industrial, and social factors in the various fields, awakening the students' critical awareness and deepening their interest. As background knowledge for taking 200-level and higher undergraduate major courses, students also learn mathematical concepts and methods, current topics in industry and advanced fields of research, the connections with undergraduate major courses, and other such matters.

<Fourth Academic Group>

Course	Number of credits	Quarter when offered
Mechanical Engineering Literacy 1	0.5-0.5-0	1Q
Mechanical Engineering Literacy 2	0.5-0.5-0	2Q
Mechanical Engineering Literacy 3	0.5-0.5-0	3Q
Mechanical Engineering Literacy 4	0.5-0.5-0	4Q

Fourth Academic Group course purpose, overview, etc.

In order to equip students to study in an independent, motivated manner the undergraduate majors to which they will advance from the Fourth Academic Group from their second year on, these courses teach a variety of subjects in the engineering field, with a focus on mechanical engineering, mainly by learning through exercises and group activities in four thematic areas. The courses also include lectures and other instruction for edification and thoughtful consideration of appropriate engineering ethics, for knowledge about specialized areas of study, and for awareness of connections with society. Students are made broadly aware of these matters and stimulated to renew their interest in them.

Note: The Mechanical Engineering Literacy courses can only be taken by newly admitted students in the Fourth Academic Group. Please pay close attention since this course cannot be retaken.

<Fifth Academic Group>

Course	Number of credits	Quarter when offered
5th Academic Group Literacy	1-0-0	1Q
Fundamentals of Electronics	1-0-0	2Q
Foundations of Computer Science I	1-0-0	3Q
Foundations of Computer Science II	1-0-0	4Q

Fifth Academic Group course purpose, overview, etc.

In connection with the electrical, information and communications, and control fields of engineering, students are made broadly aware of connections with academics, industry, and society, their critical awareness is awakened and their interest deepened, to enable them 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, as well as background knowledge about mathematical concepts and methods, about current topics in industry and in advanced fields of research, about the connections with undergraduate major courses, and other such matters in preparation for 200-level and higher undergraduate major courses.

Note: The Fifth Academic Group Literacy course can only be taken by newly admitted students in the Fifth Academic Group. Please pay close attention since this course cannot be retaken.

<Sixth Academic Group>

Course	Number of credits	Quarter when offered
6th Academic Group Literacy	1-0-0	1Q
6th Academic Group Basic Science 1	1-0-0	2Q
6th Academic Group Basic Science 2	1-0-0	3Q

6th Academic Group Basic Science 3	1-0-0	4Q

Sixth Academic Group course 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 academics, industry, and society, 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.

<Seventh Academic Group>

Course	Number of credits	Quarter when offered
Introduction to Bio-Frontier Research	1-0-0	1Q
Bio-Creative Design 1	0-1-0	2Q
Bio-Creative Design 2	0-1-0	3Q
International Bio-Creative Design	0-1-0	4Q

Seventh Academic Group course 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 *monozukuri* (high-quality manufacturing) aspects related to those issues. This works to develop an abundant creativity in a specialized field as well as to develop the critical awareness that is 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.

16. 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 experience working in a number of different laboratories.
- Occasionally the courses are also held by a number of laboratories working together as a group.

17. 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 term or the fall term 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 Study Program Guide.

When a standard study program 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 undergraduate majors, who have taken courses according to the standard study program recommended for their undergraduate major or some other study program, who have acquired the credits required for graduation, 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.

18. 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.

(Even when research guidance and so on is being received at a laboratory other than the laboratory where the independent research project for a Bachelor's Degree was conducted, the student's affiliation will be with the laboratory where the independent research project for a Bachelor's Degree was conducted.)

・During the period when the student is completing the advanced independent research project for a Bachelor's Degree, it is also possible to pursue Study Abroad or to take an internship.

(Depending on the content of the advanced independent research project for a Bachelor's Degree and the nature of the Study Abroad or other such activity, the course may be defined to receive from one to six credits. It is therefore necessary for the project plan to be carefully and thoroughly drafted and carried out.)