Yokohama National University

Graduate School of Engineering Science

Course Completion Guidelines

Academic Year 2018

Contents

Teaching Staff of the Graduate School of Engineering Science ····· 1
Academic Calendar (2017-2018) ····· 1

I. The Educational Goals of the Graduate School of Engineering Science ····· 2

II. Education Programs and Curriculum at the Graduate School of Engineering

II-1 Education Programs at the Graduate School of Engineering Science ····· 2
II-2 Curriculum at the Graduate School of Engineering Science (Departments and Specializations) ····· 4
II-3 List of Education Programs by Department and Their Descriptions ····· 5

III Common Rules in the Graduate School

III-1 Enrollment Procedure ····· 6
III-2 Foreign Language Courses ····· 11
III-3 Minor Programs ····· 11
III-4 Important Notes for International Students ····· 12
III-5 Procedures Involving Student Affairs ····· 13

IV T-type Engineering Degree (TED) Program, Professional Science Degree(PSD) Program, and Science Degree Program

IV-1 Process from the Planning of Enrollment and Research to Graduation (Obtaining the Degree) ····· 16

V Pi-type Engineering Degree (PED) Program

V-1 Process from the Planning of Enrollment and Research to Graduation (Obtaining the Degree) ····· 23

VI Course List

VI-1 Master's programs (T-type Engineering Degree (TED) Program, Professional Science Degree (PSD) Program, and Science Degree Program) ····· 31
VI-2 Doctoral programs (T-type Engineering Degree (TED) Program, Professional Science Degree (PSD) Program, and Science Degree Program) ····· 43
VI-3 Master's programs (Pi-type Engineering Degree (PED) Program) ····· 50
VI-4 Doctoral programs (Pi-type Engineering Degree (PED) Program) ····· 62

Teaching Staff of the Graduate School of Engineering Science

Graduate School of Engineering Science Website > Faculty Members

Refer to (http://www.fse.ynu.ac.jp/english/faculty/index.html).

Academic Calendar (2018-2019)

YNU > About YNU > Campus Life > Annual Schedule

Refer to (http://www.ynu.ac.jp/english/campus/schedule/index.html).

I The Educational Goals of the Graduate School of Engineering Science

Both science and engineering have a mission to directly contribute to the welfare and sustainable development of human society. Our graduate school believes that engineers and researchers play crucial roles in pioneering new industries and science fields that lead toward a brighter future while accurately assessing various social needs and addressing environmental and other global challenges. With the goal of serving as an international hub of practical science, the school aims to foster globally competitive professionals that are well versed in both science and engineering with sound ethics and enterprising spirits to learn beyond their areas of expertise.

In our master's programs, students build their foundation in a wide range of science fields, in addition to acquiring advanced knowledge and skills in the courses designed for their own areas of expertise. They also engage in research to develop original technologies and acquire new knowledge. In this manner, they are expected to grow into highly advanced and professional engineers and researchers who can identify their own research agenda and make comprehensive judgments flexibly to respond to unknown problems based on their broad perspectives.

In our doctoral programs, students engage in advanced scientific and technical research regarding the challenges that they have identified. They are expected to grow into pioneering leaders in science and industry with abilities to make comprehensive judgments based on their broad perspectives and communicate their findings throughout our society. In other words, our graduate school produces creative and highly specialized leaders who will drive further innovations.

II Education Programs and Curriculum at the Graduate School of Engineering Science

II-1 Education Programs at the Graduate School of Engineering Science

The Graduate School of Engineering Science offers four education programs (Figure 1).

Firstly, the **T-type Engineering Degree (TED)** Program overcomes the shortcomings of excessively specialized and conventional I-shaped engineering education by offering broader perspectives. Our education model has undergone reform and moved away from parochial specialization towards a more integrated engineering education that combines a high degree of specialization and broad perspectives. The vertical line of the letter T from the TED Program represents the students' in-depth research in their area of expertise at their assigned laboratories. Students must write a master's or doctoral thesis in this program, which aims to produce highly advanced engineers and researchers. Once they have completed the program, students are awarded a master's or doctoral degree in engineering.

Secondly, the **Pi-type Engineering Degree (PED)** Program is a unique education method applied in Japan for the first time. The program is designed to produce practical engineers and researchers who can turn innovations resulting from the advancement of sciences and technologies into advanced manufacturing.

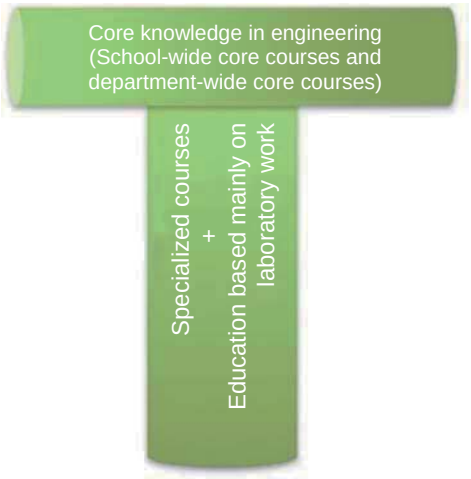
As the symbol of Pi (Π) from the PED Program represents, basic knowledge in engineering (horizontal line of Π) is combined with more than one module of specialization (two vertical lines of Π). Such a unique Yokohama-style graduate education system produces practical engineers and researchers who can respond to challenges faced by today's diversified and highly advanced industrial society. In our master's programs, students take coursework consisting of laboratory courses, exercises, and training (including long-term internship) instead of writing a master's thesis or being assigned to specific laboratories. Once they have completed the program, students are awarded a master's degree in engineering. In the doctoral programs, students are required to write a doctoral thesis, which is reviewed by keeping in mind that students are expected to become practical researchers who will lead advanced manufacturing. Once they have completed the program, students are awarded a doctoral degree in engineering.

Thirdly, YNU's original Professional Science Degree (PSD) Program enables students to acquire various necessary skills in our industrial society through workshops and internships organized to utilize the strengths of our universities while referring to the graduate education programs in science as advocated by the National Professional Science Master's Association (NPSMA). Based on their advanced knowledge in basic science, students will pursue the truth in natural science and contribute to the development of science-oriented industries in anticipation of the technological innovation for the next 10 to 20 years. They are also expected to develop knowledge in both science and engineering, as well as adequate language and other skills for working globally. In the program, workshops and internship are organized for science students of physics and chemistry to help them acquire the skills that are needed by companies. Once they have completed the program, students are awarded a master's or doctoral degree in science.

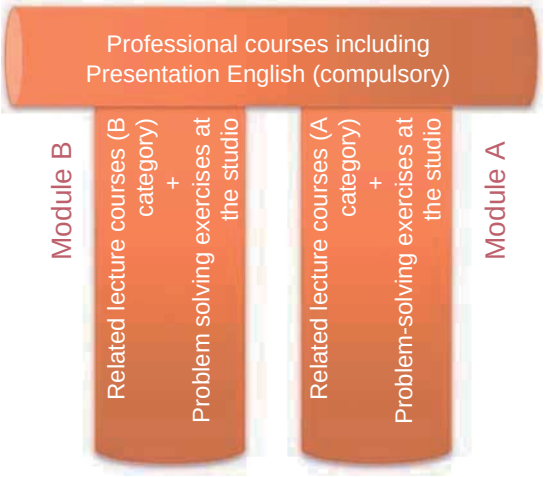
Lastly, the Science Degree Program produces deep thinkers with good judgment and advanced expertise in modern mathematics who not only pursue the truth in mathematical science, but also contribute to the development of science-oriented industries in anticipation of the technological innovation for the next 10 to 20 years. The education program is designed to apply advanced mathematical science, which is a constant and important driving force of innovation in our rapidly evolving information society. Students of mathematics are awarded a master's or doctoral degree in science.

Successful completion of the program is judged mainly based on their master's or doctoral theses.

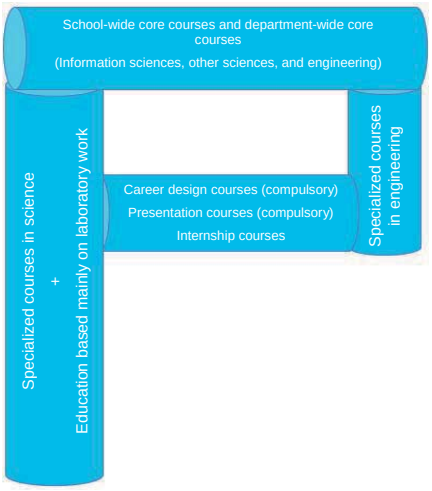
T-type Engineering Degree (TED) Program



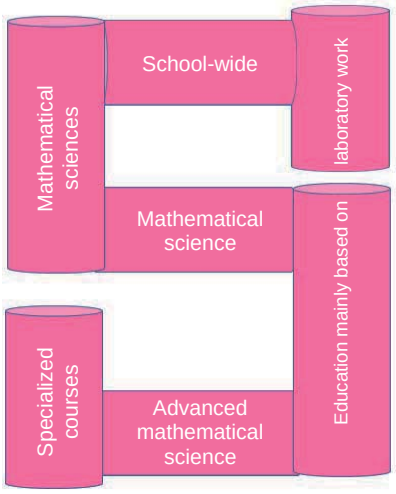
Pi-type Engineering Degree (PED) Program



Professional Science Degree (PSD) Program



Science Degree Program



(Figure 1) Structures of TED, PED, PSD, and Science Degree Programs at the Graduate School of Engineering Science

II-2 Curriculum at the Graduate School of Engineering Science (Departments and Specializations)

The departments of the Graduate Schools of Engineering Science are shown below along with the specializations covered.

Master's programs

Mechanical Engineering, Materials Science, and Ocean Engineering	Mechanical Engineering
	Materials Science Frontier
	Systems Design for Ocean-Space
	Aerospace Engineering
Chemistry and Life Science	Chemistry
	Applied Chemistry
	Chemistry Applications and Life Science
	Energy and Sustainable Chemistry
Mathematics, Physics, Electrical Engineering and Computer Science	Mathematical Sciences
	Physics
	Applied Physics
	Information Systems
	Electrical and Computer Engineering

Doctoral programs

Mechanical Engineering, Materials Science, and Ocean Engineering	Mechanical Engineering
	Materials Science Frontier
	Systems Design for Ocean-Space
Chemistry and Life Science	Chemistry
	Applied Chemistry
	Chemistry Applications and Life Science
Mathematics, Physics, Electrical Engineering and Computer Science	Mathematical Sciences
	Physics
	Applied Physics
	Information Systems
	Electrical and Computer Engineering

II-3 List of Education Programs by Department and Their Descriptions

Programs offered by each department of the Graduate School of Engineering Science are described below.

The parts marked by asterisks apply only to master's programs.

Program	Awarded degree	Description	Mechanical Engineering, Materials Science, and Ocean Engineering				Chemistry and Life Science				Mathematics, Physics, Electrical Engineering and Computer Science				
			Mechanical Engineering	Materials Science Frontier	Systems Design for Ocean-Space	Aerospace Engineering	Chemistry	Applied Chemistry	Chemistry Applications and Life Science	Energy and Sustainable Chemistry	Mathematical Sciences	Physics	Applied Physics	Information Systems	Electrical and Computer Engineering
TED	Engineering	(T-type Engineering Degree Program) In-depth education in the area of specialization is combined with education to lay the foundation in a broad range of areas, including other fields.	○	○	○	○*		○	○	○*			○	○	○
PED	Engineering	(Pi-type Engineering Degree Program) Practical education is offered in a combination of modules, each of which systematically integrates a studio (laboratory courses, exercises, and training related directly to manufacturing and conducted in a small team) with related lecture courses. In master's programs, studio deliverables are mainly used to prepare portfolios in place of a master's thesis.	○	○	○	○*			○				○	○	○
PSD	Science	(Science education with an eye to future engineering: Professional Science Degree Program) The programs aim to produce professionals with knowledge in basic science to drive technological innovation and science-oriented industries, as well as skills to work globally.					○					○			
Science	Science	(Science Degree Program) The programs produce professionals who can apply their knowledge in mathematical science and contribute to the development of science-oriented industries in anticipation of technological innovation.									○				

III Common Rules in the Graduate School

III-1 Enrollment Procedure

1. Procedures for Course Registration

Students cannot take courses without first enrolling through the Educational Affairs Information System. They will not receive any grades (credits) for such courses either, even if they have passed the examinations.

Connect to the YNU's Educational Affairs Information System from your web browser and enter the time schedule code of the course that you want to enroll in.

Go to the top page of the YNU website and login to the Educational Affairs Information System by choosing YNU > Campus Life > Y's Net for Students > Educational Affairs Information System (http://www.ynu.ac.jp/campus/student_only/affairs_system.html).

Off-campus enrollment is also possible by logging into the Educational Affairs Information System via the Matrix Authentication System at the Information Technology Service Center (https://matrixauthsv.ynu.ac.jp/portal/).

(1) Enrollment period

Spring semester:	April 13 (Friday)–April 20 (Friday)	9:00–21:00 on weekdays
Fall semester:	October 12 (Friday)–October 19 (Friday)	9:00–21:00 on weekdays

* Submit your Course Registration Plan to the Graduate School of Engineering Science Section by the following date. Make sure to keep one copy for yourself.
Submission deadline Spring semester: April 23 (Monday) Fall semester: October 22 (Monday)

(2) Enrollment confirmation and modification period

Spring semester:	May 7 (Monday)–May 9 (Wednesday)	9:00–21:00 on weekdays
Fall semester:	October 24 (Wednesday)–October 26 (Friday)	9:00–21:00 on weekdays

* Make sure that your courses have been registered according to your enrollment plan. Any mistakes in registration or errors with the courses should be fixed by adding or deleting courses in the Educational Affairs Information System.
* No correction or addition can be made if you have failed to register any course during the enrollment period.

(3) Enrollment cancellation period

Spring semester:	May 14 (Monday)–May 18 (Friday)	9:00–21:00 on weekdays
Fall semester:	November 5 (Monday)–November 9 (Friday)	9:00–21:00 on weekdays

* You may cancel (delete) your enrollment for a particular course in the Educational Affairs Information System if the course turns out to be completely different from what you expected or for any other reasons. If you abandon a course halfway without cancelling the enrollment, you will receive "F (Fail)" as your grade for that course. You can only cancel courses during the enrollment cancellation period.
* If you modify or cancel your enrollment after the enrollment registration period, make sure to submit your revised Course Registration Plan after confirming with your academic advisor. The deadline is May 21 (Monday) for the spring semester and November 12 (Monday) for the fall semester.

2. General Note Regarding Enrollment

1) Courses must be registered by the specified deadline for both spring and fall semesters. In principle, the registered courses in the enrollment plan that you have submitted cannot be changed.
2) You may not take courses that you have not enrolled in.
3) You may not enroll in two or more courses in the same time slot.
4) Full-year courses (offered in both spring and fall semesters) cannot be taken only in the spring or fall semester.
5) After receiving credits from a course, you cannot take the course again.

3. Course Overview

(1) Outline of each course (syllabus)

1) The basic information on each course is electronically published, along with the course objective, course plan, learning activities beyond class hours, study goals and targets, grading method, and the way the class is conducted. Starting from courses offered in academic year 2010, syllabuses can be searched by college, school, or teacher, or using any keyword. Students can browse syllabuses on the Educational Affairs Information System, which contains different items than syllabuses that are available to the public.

(2) The time schedule at the Graduate School of Engineering Science

1) The time schedule at the Graduate School of Engineering Science is not distributed in the form of a brochure.
2) Browse the schedule on the website of the Graduate School of Engineering Science (http://www.fse.ynu.ac.jp/education/index.html). Any date and classroom name not indicated for a course on the time schedule will be announced on the bulletin board, etc., as soon as they are finalized.

4. Course Numbering

The numbering code is a number used to indicate the specialization and level of difficulty for each course. (For more details, go to the top page of the YNU website > Education and Research > Educational Activities > Graduate Education Policy: YNU Initiative.)

* Numbering rule

<table>
<tr><th>Digit</th><th colspan="2">Indication</th><th>Alphanumeric notation</th></tr>
<tr><td>First and second digits</td><td>School</td><td>Graduate School of Engineering Science</td><td>ES*****</td></tr>
<tr><td rowspan="4">Third digit</td><td rowspan="4">Department and course (school-wide, department-wide, or specialized)</td><td>School-wide</td><td>ESa****</td></tr>
<tr><td>Mechanical Engineering, Materials Science, and Ocean Engineering</td><td>ESb****–ESe****</td></tr>
<tr><td>Chemistry and Life Science</td><td>ESf****–ESi****</td></tr>
<tr><td>Mathematics, Physics, Electrical Engineering and Computer Science</td><td>ESj****–ESm****</td></tr>
<tr><td rowspan="2">Fourth digit</td><td rowspan="2">Learning level</td><td rowspan="2">Level code of course</td><td>ES*4****–ES*6***</td></tr>
<tr><td>ES*9***</td></tr>
<tr><td rowspan="2">Fifth to seventh digits</td><td colspan="3">Numbering according to the specialization of lecture courses</td></tr>
<tr><td colspan="2">Numbering of non-lecture courses according to the specialization and type of course
* The fifth digit is fixed at "0," the sixth digit indicates the specialization, and the seventh digit indicates the type of course</td><td>ES**0**</td></tr>
</table>

5. Standard Class Hours per Course

Standard class hours per credit for a course are determined as follows:

1) For each lecture or exercise course, one credit is usually awarded for every 15-class hours, but some exercises award one credit for every 30-class hours.
2) For experiments, laboratory courses, and practices, one credit is usually awarded for every 30-class hours. If deemed necessary for educational purposes, some experiments and laboratory work award one credit for every 45-class hours.
3) If one course combines lectures, exercises, experiments, laboratory work, or practices, the number of awarded credits is calculated based on the number of class hours according to the combination of learning activities.

6. Examinations

1) The examination periods are defined in the academic calendar (*).
2) As a rule, the examination for each course is conducted on the day of the week and hour specified in the time schedule.
3) In general, no class will be conducted except for examinations during the examination period, with the exception of some classes.
4) Please obey the following rules when you are taking an examination:
   - During an examination, display your student ID on your desk.
   - Disciplinary action will be taken for any misconducts during an examination pursuant to Article 24 of the Graduate School General Regulation.

* The academic calendar of YNU is organized in two semesters and six terms. Courses are offered either by semester or by term. The Graduate School of Engineering Science conducts courses in two semesters—spring and fall.

7. Credit Recognition and Grades

1) Grades are determined based on scores from examinations and written assignments.
2) As a general rule, no additional or make-up examinations will be held.
3) Check your grades in the Educational Affairs Information System. Grades from the spring semester are available from the first day of the fall semester in early October, while grades from the fall semester are available from the first day of the spring semester in early April of the next academic year.
4) The completion of a program requires a GPA (Grade Point Average) of 2.0. In order to calculate the GPA, a grade point is assigned to each grade. The grade point of each course taken by a student is multiplied with the number of credits assigned for that course. The student's GPA is the sum of all the courses taken divided by the total number of credits for the enrolled courses.
5) The number of credits from cancelled courses is deducted from the number of credits from registered courses. The grade for any abandoned course after the specified cancellation deadline will be "F (Fail)."
6) You can retake a course if you have received a grade of "F (Fail)." If the course is successfully completed, the grade from the retaken course is counted in the GPA, although the number of credits from that course will not be added to the denominator for calculating the GPA.

Grade	Grade Point	Score	Pass/Fail
Excellent *	4.5	100–90	Pass
Very good *	4	89–80	
Good	3	79–70	
Fair	2	69–60	
Fail	0	59–0	Fail

$$\text{GPA} = \frac{\Sigma\,(\text{GP} \times \text{Number of credits})}{\text{Total number of credits from registered courses}}$$

* Grading criteria
The grade of "Excellent" with scores of 90 or more is awarded for surpassing the learning goals.
The grade of "Very Good" with scores between 80 and 89 is awarded for achieving the learning goals.

8. Enrollment of College-level Courses

Master's programs

In the Graduate School of Engineering Science, master's students in TED, PSD, and Science Programs may substitute up to 10 credits from specialized courses with credits from college-level courses according to the instruction or advice from their advisors. (The PED Program allows students to take college-level courses, but the credits cannot be counted towards the completion of the program.)

Enrollment is possible only with the following specified courses. The number of assigned credits is as indicated for each course.

Note that the **specialization in mechanical engineering** for both TED and PED Programs does not permit the enrollment of college-level courses.

Department	Specified Course
Mechanical Engineering, Materials Science, and Ocean Engineering	Internal Combustion Engines, Microstructure and metallurgy, X-ray Diffraction in Materials Science , Physical Metallurgy and Exercise I, Physical Metallurgy and Exercise II, Strength of Crystalline Solids , Strength and Fracture of Materials , Electronic Properties of Solids , Mathematical Theory of Plasticity , Metal Forming, Solidification Theory, Computational Materials Science, and Environment Conscious Materials
Chemistry and Life Science	Physical Organic Chemistry, Introduction to Solid State Physics, Quantum Chemistry, Coordination Chemistry, Structural Biochemistry, Organometallic Chemistry, Design of Organic Synthesis , Structural Chemistry, Cosmogeochemistry , Polymer Chemistry 1 , Synthetic Organic Chemistry , Electrochemistry B , Inorganic Solid State Chemistry, Polymer Chemistry 2, Inorganic Material Chemistry , Chemistry of Organic Functional Materials, Polymer Chemistry, Fundamental Catalytic Chemistry, Applied Electrochemistry, Analytical Chemistry 2B, Analytical Chemistry 3, Design and Drawing of Machinery and Apparatus, Introduction to Industrial Chemistry, Thermodynamics for energy conversion , Engineering Materials, Process System Engineering, Strength and Fracture of Materials, Safety Engineering for Energetic Materials , Environmental Engineering 2, Environmental and Energy System Theory, Separation science and engineering, Fluid engineering, Risk engineering , Environmental Engineering 1, Chemical Reaction Engineering, Bioengineering 1, and Bioengineering 2
Mathematics, Physics, Electrical Engineering and Computer Science	Advanced Electrical and Computer Engineering, Electrical Energy Engineering, Electrical Energy System Engineering , Materials Science and Technology for Electricity, Power Electronics , Basic Control Theory, Digital Control , System Engineering, Nano-Electronics, Semiconductor Engineering , Electronic Devices , VLSI Systems , Radio Frequency Circuit Theory , Analog Circuit Design , Optical Engineering, Optoelectronics, Electromagnetic Wave Engineering, Communication System, Digital Signal Processing, Digital Communications , Robotics and Mechatronics, Practical Software Engineering, Quantum Statistical Mechanics, Quantum Mechanics 3, Electromagnetism 3, Solid State Physics 1, Solid State Physics 2, High Energy Physics, Advanced Solid State Physics, Computer Physics , Galois Theory and Number Theory , Manifold Theory , Functional analysis , Probability Theory with Applications , Stochastic Models, and Engineering Mathematics Statistics

Doctoral programs

Students of doctoral programs may not take college-level courses except for courses of foreign languages (introductory level) and Japanese language (note that credits from these courses are not counted towards the completion of programs).

9. List of Items to be Submitted

The following lists items to be submitted from admission until graduation, along with the submission period and place of submission.

Master's programs

Submission period	Required document	Target programs	Place of submission	Remarks
After the orientation	Enrollment adjustment sheet	TED, PSD, SD, PED	Graduate School of Engineering Science Section	Adjustment sheet for practical courses with enrollment limits
Enrollment period for the spring semester in the first year	Course Registration Plan	TED, PSD, SD, PED	Graduate School of Engineering Science Section	The plan must be signed and affixed with a seal by the academic advisor.
Enrollment period for the fall semester in the first year	Course Registration Plan	TED, PSD, SD, PED	Graduate School of Engineering Science Section	The plan must be signed and affixed with a seal by the academic advisor.
After the fall semester in the first year	Studio deliverables	PED	Affiliated laboratory	Deliverables from studio courses taken in one year
Enrollment period for the spring semester in the second year	Course Registration Plan	TED, PSD, SD, PED	Graduate School of Engineering Science Section	The plan must be signed and affixed with a seal by the academic advisor.
Enrollment period for the fall semester in the second year	Course Registration Plan	TED, PSD, SD, PED	Graduate School of Engineering Science Section	The plan must be signed and affixed with a seal by the academic advisor.
After the fall semester in the second year	Studio deliverables	PED	Affiliated laboratory	Deliverables from studio courses taken in one year
Deadline specified by each specialization	Master's thesis	TED, PSD, SD	According to the instruction given in each specialization	
	Portfolio	PED		After the thesis defense, upload the latest portfolio to the Learning Management System.

Doctoral programs

Submission period	Required document	Target programs	Place of submission	Remarks
Enrollment period for the spring/fall semester	Course Registration Plan	TED, PSD, SD, PED	Graduate School of Engineering Science Section	The plan must be signed and affixed with a seal by the academic advisor.
After the fall semester	Studio deliverables	PED	Affiliated laboratory	Deliverables from studio courses taken in one year
Year of completion	Doctoral thesis	TED, PSD, SD, PED	Graduate School of Engineering Science Section	Detailed instructions from the Graduate School of Engineering Science will be provided by the academic advisor.

III-2 Foreign Language Courses

1. Enrollment of Japanese Language Courses

(1) Japanese language courses are intended for international students.

(2) International students are requested to pay attention to announcements from the International Student Center.

(3) International students must take placement tests (so that they can be placed in suitable classes).

(4) Check the schedule of placement tests in News & Information on the top page of the website of the International Student Center (http://www.isc.ynu.ac.jp).

(5) After placement, enroll in the Japanese language courses offered by the International Student Center. (If credits are needed, take Japanese language courses for international exchange. If not, take university-wide Japanese language courses.)

2. Enrollment of Introductory Foreign Language Courses (University-wide)

Students who wish to enroll in foreign language courses should consult with the Graduate School of Engineering Science Section in advance.

Note that undergraduate students are given priorities in the enrollment of introductory foreign language courses. Anyone interested will be informed of available courses after checking the enrollment by undergraduate students. Enroll in available courses during the period for enrollment and modification.

3. Credits from Foreign Language Courses

Credits from foreign language courses are not counted as credits needed to complete a study program. However, a student who has taken courses in one foreign language (non-native) during their master's or doctoral program may be exempted from language examination during their doctoral thesis defense.

The abovementioned language examination is conducted for international students in a non-native language (including Japanese).

III-3 Minor Programs

Minor programs are offered to meet the diverse learning needs of students and to motivate them by acknowledging the outcome of their systematic learning in specific areas through specific assignments. Students who satisfy the requirements to complete the program are awarded certificates, and the completion is stated in their transcripts. Requirements for enrollment vary from one program to another. For more details, go to the top page of the YNU website > Education and Research > YNU Education > Minor Programs (http://www.ynu.ac.jp/education/ynu_education/vice_special.html).

III-4 Important Notes for International Students

1) Make sure to participate in the orientation for incoming international students organized at the beginning of each semester (April and October).
2) Please try to learn Japanese as most courses at the Graduate School of Engineering Science are offered in Japanese, although some courses are offered in English. There are also other regular courses related to Japanese language that are offered at YNU. For more information, please refer to the website of the International Student Center (http://www.isc.ynu.ac.jp/study/).
3) Some departments offer lectures designed for international students. Make the most of this opportunity by following the instruction and advice from your advisor.
4) Lectures offered at a college can be taken if the intended research requires the relevant basic knowledge provided in those lectures. Take those lectures as necessary according to the instruction and advice from your advisor. (Refer to "Enrollment to college-level courses" on page 12.)
5) Join an appropriate insurance as you may experience illness, accident, or unexpected trouble during your study period.
6) Matters related to scholarships, dormitories, and the welfare of international students are handled by the Student Support Division and the International Affairs Division of the Student Affairs and International Relations Department (both located on the second floor of the International Student Center). If necessary, consult these divisions or the Graduate School of Engineering Science Section.
7) A tutor is assigned to each international student during the first year of their studies. Make the most of the assistance from the tutor by consulting all matters related to your study program.

III-5 Procedures Involving Student Affairs

1. Leave of Absence

1) If you wish to apply for a leave of absence due to an illness or for other reasons within the academic year, submit the application for a leave of absence (to be co-signed by a parent or another contact person) and obtain approval from the Principal in accordance to the criteria for the approval of leave of absence from YNU. The application must be submitted at least 10 days before the intended leave begins. (Contact the Graduate School of Engineering Science Section to receive the necessary application form.)

2) You may be required to take a leave of absence if your continued study is deemed undesirable due to an illness. (Article 50, University General Regulations)

3) If a leave of absence was approved but the cause for the leave is not resolved even after the approved period has expired, the student may apply for an extension. (Apply for the extension before the leave of absence expires by contacting the Graduate School of Engineering Science Section and obtaining the necessary application form.)

4) The period of leave of absence is not counted in the period of enrollment.

5) The period of leave cannot exceed two years for a master's program and three years for a doctoral program.

* Contact the Graduate School of Engineering Science Section as soon as you have decided to apply for a leave to discuss matters including the procedure related to tuition fee.

(Reference: Article 15, Regulations on Tuition Waiver and Postponement of Collection at Yokohama National University
http://somu-somu.ynu.ac.jp/gakugai/kisoku/act/frame/frame110000168.htm)

(Reference) Criteria for the approval of leave of absence from YNU

Article 1 Pursuant to Paragraph 4, Article 50 of the General Regulations of Yokohama National University (hereinafter "University General Regulations"), a leave of absence is approved if a person requires continued absence for at least three months for any of the reasons mentioned in the following items:

(1) Sickness or injury of the applicant (a medical certificate is required)

(2) Childbirth by the applicant or child-rearing of the applicant's child (including a legally adopted child) until the child reaches the age of three (a medical certificate for the child delivery, etc., is required)

(3) Financial difficulties (a written justification and documents to prove the fact is required)

(4) The applicant needs to temporarily help the family business due to the death of the head of the household or the like (a written justification and documents to prove the fact is required)

(5) The applicant needs to take care of a sick family member (a written justification and medical certificate to prove the sickness, or a written justification and a certificate to prove the need for long-term care are required)

(6) Work obligation (a certificate from the employer is required)

(7) Acknowledged educational benefit of studying at a foreign university, college, or graduate school (a document to prove the intended study at the host university, college, or graduate school, and a document describing the intended study are required)

(8) Other unavoidable reasons acknowledged by the faculty council (a document to prove the reason is required)

Article 2 The reason stipulated in Paragraph 2, Article 51 of the University General Regulation and in Paragraph 3, Article 22 of the YNU Graduate School General Regulations shall be limited to item 2 in the previous paragraph.

2. Re-enrollment

1) If the reason for a leave of absence is resolved during the approved period of leave, re-enrollment can be made by obtaining the approval of the Principal. (Contact the Graduate School of Engineering Science Section to obtain the necessary application form.)

2) Once re-enrolled, the student must pay tuition for the period of study as calculated on a monthly basis.

3. Withdrawal

1) If you wish to withdraw from the course, submit an application (to be co-signed by a parent or a contact person) along with a written justification and obtain approval from the Principal. The application must be submitted at least 10 days before the intended date of withdrawal. (Contact the Graduate School of Engineering Science Section to obtain the necessary application form.)

2) You still have to pay tuition for the semester even if you have withdrawn from the course.

3) The student ID must be returned when you withdraw.

4. Application to Another University

1) A student may submit an application to another university and take the entrance examination by obtaining the approval of the Dean of the Graduate School of Engineering Science. (Contact the Graduate School of Engineering Science Section to obtain the necessary application form.)

2) If you successfully pass the entrance examination to another university, immediately follow the steps to withdraw from our university.

5. Procedure for Going Abroad

Follow the necessary procedure by referring to "Procedure for Going Abroad" on the website of the Graduate School of Engineering Science (http://www.fse.ynu.ac.jp/education/index.html). Make sure to start preparing well in advance as some steps may take time.

6. Notifications

Notification	Place of submission	Timing/Deadline	Remarks
Change of the student's address	Educational Affairs Division, Student Affairs and International Relations Department (second floor of the International Student Center)	After any change	
Change of domicile			
Change of surname or given name			Attach a copy of the family register
Change of address of parents, etc.			
Change of the student's permanent domicile			
Overtime research	Register through the Electronic Management System for Overtime Research (http://www.rms.ynu.ac.jp/)		Overtime research notification can be submitted instead of an application for borrowing a facility if research needs to be continued after 21:00, overnight, or during holidays.
Internship report		After the internship is over	The form is available on the website of the Graduate School of Engineering Science (http://www.fse.ynu.ac.jp/education/index.html). * Submit it as an attachment to an email.

7. Issuance of Certificates

(1) Certificates of enrollment (Japanese/English), transcripts (Japanese/English), certificates of expected completion (Japanese/English), student discount certificates for public transportation, and health certificates can be issued by automated certificate-issuing machines.

(2) Other certificates cannot be issued immediately. Check the necessary application form and place of submission, then go to the specified office to fill in and file the necessary application.

8. Issuance of Certificates after the Program Completion

Go to the YNU website to learn how to apply for certificates.

If you have any questions, contact the Graduate School of Engineering Science Section by phone (+81-45-339-3817).

9. Collection of Tuition and Delinquency

Tuition fees will be collected in accordance with the "Regulations on the Collection of Tuition Fees by Yokohama National University and Reminders to Delinquents" (http://somu-somu.ynu.ac.jp/gakugai/kisoku/act/frame/frame110000184.htm). Pay attention to the date of automatic withdrawal, etc.

IV T-type Engineering Degree (TED) Program, Professional Science Degree (PSD) Program, and Science Degree Program

IV-1 Process from the Planning of Enrollment and Research to Graduation (Obtaining the Degree)

1. Purpose

Students of the T-type Engineering Degree (TED) Program, Professional Science Degree (PSD) Program, and Science Degree Program are assigned to laboratories for in-depth specialized learning. The research and education are conducted mainly in the form of courses and instructions on writing a thesis.

Courses offered in master's programs are classified into categories and types mainly according to their contents and intended targets. Categories mainly depend on the contents of courses and are divided into information science courses, science courses, engineering courses, and professional courses.

Types mainly depend on the intended target and are divided into school-wide courses, department-wide courses, and specialized courses.

The study and research in these courses must be planned to clarify the purpose for enrolling in a master's or doctoral program and to achieve the purpose (obtaining a degree).

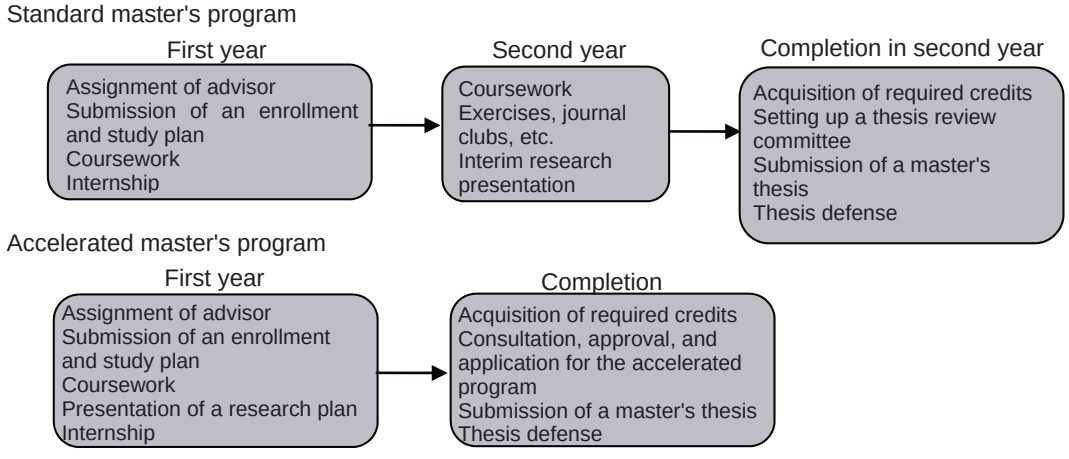
2. Academic Advisors and the Study Plan (Enrollment and Research)

1) An academic advisor is assigned immediately after a student is admitted to a program.
2) Each student must develop a Course Registration Plan according to the purpose of their study, academic background, and learning ability while seeking due guidance and advice from the advisor, and obtain approval.
3) Complete the enrollment within the enrollment period and submit the Course Registration Plan with the signature and seal of the academic advisor attached (refer to page 6).
4) Refer to page 6 to learn how to enroll in courses.
   The Course Registration Plan must be followed through in each academic year.
5) The progress of the plan must be discussed with the academic advisor in each academic year.

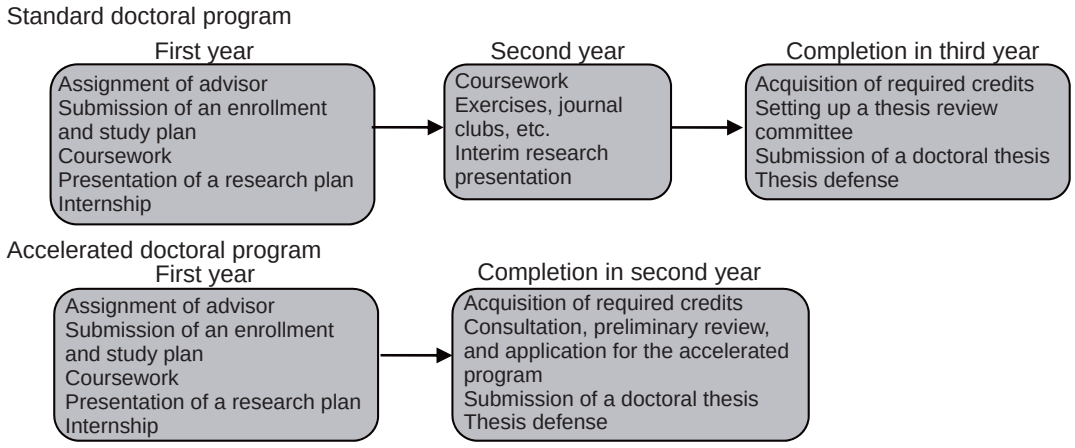
3. Flow of Study

Study refers to students' initiatives to learn and academically train themselves. The flows of study at our master's and doctoral programs are presented below.

Flow of study in a master's program



Flow of study in a doctoral program



4. Enrollment Procedure, etc.

1) Please read "III-1 Enrollment Procedure" carefully.
2) If you have any questions, contact your academic advisor, the academic affairs and library officer of the graduate school, or the Graduate School of Engineering Science Section.
3) It is necessary to obtain approval for the enrollment and study plan from your advisor before submitting it to the Graduate School of Engineering Science Section.

5. Necessary Credits and Requirements for Graduating

The number of necessary credits and other requirements for completing the master's and doctoral programs are presented in the following table.

Requirements for completing the TED/PSD/Science Programs at the Graduate School of Engineering Science

Master's programs

<table>
<tr><th colspan="2">Courses</th><th colspan="2">Necessary number of credits</th></tr>
<tr><td rowspan="4">School-wide core courses</td><td>Information course group</td><td>At least 2 credits</td><td rowspan="4">At least 6 credits</td></tr>
<tr><td>Science course group</td><td rowspan="3">At least 2 credits from courses and course groups specified by the department [*]</td></tr>
<tr><td>Engineering course group</td></tr>
<tr><td>Professional course group</td></tr>
<tr><td rowspan="3">Department-wide core courses</td><td>Information course group</td><td rowspan="3">At least 2 credits from courses and course groups specified by the department [*]</td><td rowspan="3">At least 4 credits</td></tr>
<tr><td>Science course group</td></tr>
<tr><td>Engineering course group</td></tr>
<tr><td colspan="2">Specialized courses</td><td colspan="2">At least 10 credits from courses specified by the department. Exercise courses in the second year (4 credits in total) are required. [*2]</td></tr>
<tr><td colspan="2">Number of necessary credits (total)</td><td colspan="2">At least 30 credits (with GPA of 2.0 or greater)</td></tr>
</table>

*1: The TED Program only requires credits from the engineering course group while the PSD Program only requires credits from the science course group, but there is no requirement for specific courses for both programs.

The Science Degree Program requires the following courses.

- **Required school-wide core courses**

  At least two credits from Algebra, Geometry, Analysis, and Data Science (all of them are courses classified as Mathematical Science)

- **Required department-wide core courses**

  Algebra, Geometry, Analysis, Probability A, Probability B, and Statistics (all of them are courses in Advanced Mathematical Science)

*2: Refer to pages 48 through 57 to find out courses specified by each department and other required courses.

* Courses from other departments and specializations can be taken as department-wide core courses or specialized courses.

Doctoral programs

Courses	Necessary number of credits
Advanced exercises	3 credits
Number of necessary credits (total)	At least 9 credits (with a GPA of 2.0 or greater)

6. Cross-enrollment Between Master's and Doctoral Programs

Master's programs

Students of master's programs may not take courses offered in doctoral programs.

Doctoral programs

Students of doctoral programs may take specialized lecture courses offered in master's programs according to the guidance and advice from their advisors.

7. Enrollment in Courses Offered by Other Graduate Schools or Other Universities

Master's and doctoral programs

According to the guidance and advice from their advisors, students of the TED, PSD, and Science Programs can substitute up to 10 credits from specialized courses by taking courses offered at other departments in the Graduate School of Engineering, as well as the Graduate School of Urban Innovation, Graduate School of Environment and Information Science, Graduate School of Education, Graduate School of International Social Sciences (up to six credits only), and other graduate schools from partner universities of YNU for credit transfers (lectures only).

Prior to any such enrollment, contact the Graduate School of Engineering Science Section. The enrollment cannot be made without the approval of the faculty responsible for the intended course.

8. Enrollment in Foreign Language Courses

Master's and doctoral programs

1) Credits from foreign language courses are not counted as credits required to complete a study program. However, a student who has taken courses in one foreign language (non-native) during their master's or doctoral program may be exempted from language examination during their doctoral thesis defense.

   The abovementioned language examination is conducted for international students in a non-native language (including Japanese).

2) Foreign language courses are not offered at the Graduate School of Engineering Science. Consult with the Graduate School of Engineering Science Section if you wish to take introductory foreign language courses (see page 11).

3) International students can take Japanese language courses and other courses in Japanese affairs (see page 11).

9. Accelerated Programs

Master's programs

A standard master's program lasts two years, but it can be completed after at least one year of enrollment if a student has conducted excellent research that was acknowledged by the faculty council to have satisfied requirements for accelerated programs.

Doctoral programs

A standard doctoral program lasts three years, but it can be completed after at least one year of enrollment if a student has conducted excellent research that was acknowledged by the faculty council to have satisfied requirements for accelerated programs.

10. Academic Thesis

No credits are given for academic theses for obtaining a degree.

(1) Thesis defense, etc.

Students who are certain that they satisfy the requirements for completing their master's or doctoral programs must apply for a thesis defense. The application must be filed while they are still enrolled. Submission deadlines for applications are presented below. Students will receive notifications on the procedure and schedule for completing each program at appropriate timings from the Graduate School of Engineering Science Section through their academic advisors. For more details on the thesis defense, refer to the Thesis Defense Regulation of YNU's Graduate School of Engineering Science.

Master's programs	Doctoral programs
Follow the deadlines specified according to specializations	December for completion in March
	March for completion in June
	June for completion in September
	September for completion in December

(2) Awarded degrees and specializations

The following academic degrees are awarded according to the department in which a master's or doctoral program is completed.

Program	Department	Specialization	Degree
Master's program	Mechanical Engineering, Materials Science, and Ocean Engineering	Mechanical Engineering	Master (Engineering)
		Materials Science Frontier	Master (Engineering)
		Systems Design for Ocean-Space	Master (Engineering)
		Aerospace Engineering	Master (Engineering)
	Chemistry and Life Science	Chemistry	Master (Science)
		Applied Chemistry	Master (Engineering)
		Chemistry Applications and Life Science	Master (Engineering)
		Energy and Sustainable Chemistry	Master (Engineering)
	Mathematics, Physics, Electrical Engineering and Computer Science	Mathematical Sciences	Master (Science)
		Physics	Master (Science)
		Applied Physics	Master (Engineering)
		Information Systems	Master (Engineering)
		Electrical and Computer Engineering	Master (Engineering)
Doctoral programs	Mechanical Engineering, Materials Science, and Ocean Engineering	Mechanical Engineering	Doctor (Engineering)
		Materials Science Frontier	Doctor (Engineering)
		Systems Design for Ocean-Space	Doctor (Engineering)
	Chemistry and Life Science	Chemistry	Doctor (Science)
		Applied Chemistry	Doctor (Engineering)
		Chemistry Applications and Life Science	Doctor (Engineering)
	Mathematics, Physics, Electrical Engineering and Computer Science	Mathematical Sciences	Doctor (Science)
		Physics	Doctor (Science)
		Applied Physics	Doctor (Engineering)
		Information Systems	Doctor (Engineering)
		Electrical and Computer Engineering	Doctor (Engineering)

(3) Evaluation standards for academic theses

Theses papers are evaluated according to the following standards set by each department.

	Master's programs	Doctoral programs
Mechanical Engineering, Materials Science, and Ocean Engineering	Engineering (TED) 1. Original research that was conducted with a suitable choice of theme; 2. Results of the research make a significant academic or practical contribution; 3. Results are reliable; and 4. The reasoning, composition, and expression in the thesis are appropriate.	Engineering (TED) In addition to the standards for master's programs presented on the left: 1. The research produces new and advanced results that substantially contribute to the development of the field; and 2. The thesis content is good enough to be published in scientific journals.
Chemistry and Life Science	Engineering (TED) and Science (PSD) 1. The research project is appropriate and meaningful according to scientific and technological standards in the area of specialization; 2. The methodology for the research project is appropriate and meaningful according to scientific and technological standards in the area of specialization; and 3. The master's thesis is structured and written in a logical and original manner and produces significant results in academic or engineering terms.	Engineering (TED) and Science (PSD) 1. The research project is appropriate and meaningful according to scientific and technological standards in the area of specialization; 2. The methodology for the research project is appropriate and meaningful according to scientific and technological standards in the area of specialization; and 3. The doctoral thesis is structured and written in a logical and original manner, produces significant results in academic or engineering terms, and has a universal value.
Mathematics, Physics, Electrical Engineering and Computer Science	Engineering (TED), Science (PSD), and Science Degree 1. The research agenda of the thesis is useful in engineering terms, has a universal scientific value, or appropriate in other ways; 2. The research method in the thesis is appropriate (e.g., experiment method, calculation method, etc.); 3. Research results and consideration are appropriate, logical, and original; and 4. The structure and expressions used in the thesis are appropriate.	Engineering (TED), Science (PSD), and Science Degree 1. The research agenda of the thesis is useful in engineering terms, has a universal scientific value, or appropriate in other ways; 2. The research method in the thesis is appropriate (e.g., experiment method, calculation method, etc.); 3. Research results and consideration are appropriate, logical, and original; and 4. The structure and expressions used in the thesis are appropriate.

(4) Ethical review

Immediately before any doctoral thesis defense (a thesis revised after the preliminary review of all departments in the Graduate School of Engineering Science), the academic advisor will check that it has proper copyright protection by using iThenticate. The application is then submitted to the thesis review committee. Before the final review, the committee examines the thesis while also checking that proper consideration has been given to copyright. The committee states the review results in the doctoral thesis review report.

11. Working Students

Aside from the method mentioned earlier, students admitted under the exceptional educational method stipulated in Article 14 of the Standards for the Establishment of Graduate Schools (hereinafter called "working students") will be enrolled in the following manner:

(1) Exceptions for working students

1) Working students must attend courses full time for at least one year of the standard period for each program (two years in master's programs and three years in doctoral programs).
2) Courses are offered in the evening on working days (17:50–19:20) as an exception, although working students may also take courses offered in the daytime and all other timeslots.
3) During the mandatory full-time study for one year in a master's program, they must make an enrollment plan to acquire the necessary credits from evening classes (17:50–19:20) in order to properly conduct their master's research. In other words, during this period, daytime courses should only be taken when such courses are not offered in the evening.
4) Once admitted, they must seek guidance from their academic advisors and develop an enrollment and study plan for two years of master's program or three years of doctoral program.
5) If it is impossible to complete the program in the standard period of study due to professional reasons, they should consider making an enrollment and study plan for three to four years of master's program or four to six years of doctoral programs.
6) Working students should declare and gain approval for any change in their enrollment and study plan made as an exception.

(2) Exceptions for making the most of available courses

Non-working students may take courses according to the abovementioned exceptions when their academic advisors acknowledge that there is such a need.

V Pi-type Engineering Degree (PED) Program

V-1 Process from the Planning of Enrollment and Research to Graduation (Obtaining the Degree)

1. Purpose

The advanced manufacturing pursued in PED Programs refers to the following set of activities by scientists and engineers who engage in creative designing:

- Develop the best system under multiple conflicting technical constraints.
- Incorporate results from advanced analysis and measurements into manufacturing accurately.
- Embody free and flexible ideas and concepts under given conditions.
- Conduct design and development based on accurate knowledge while considering the environment and safety.
- Apply basic principles and design future manufacturing to add specific functions.

The education and guidance under PED Programs are directed by the following basic policy to cultivate practical engineers and researchers who will lead advanced manufacturing.

(1) The education is mainly conducted through laboratory courses, exercises, and trainings in a small group. These activities that are directly linked with manufacturing are called "studios." As part of the studio work, we recommend doing long-term internships conducted at companies in close partnership with the Graduate School of Engineering Science.

(2) Students must take "modules" that are systematically composed of studios and internship courses.

According to this basic policy, no master's thesis is assigned in master-level PED Programs. The completion is judged based on the portfolio compiling the results from a studio. In each studio, a sufficient amount of time is designated for paper assignments and presentation guidance to strengthen students' logical thinking and scientific writing skills, as well as to cultivate the communication skills that are required for them to play active roles in the society as practitioners. Similar to other programs, each student is asked to write a doctoral thesis in doctor-level PED Programs, but they are evaluated as practitioners in pursuit of advanced manufacturing, rather than researchers who are engaging in basic research.

Before beginning their studies, each student must develop an adequate study plan to clarify the purpose for enrolling in a master's or doctoral program and to achieve the purpose (obtaining a degree).

2. Academic Advisors and the Study Plan

1) Modules and an academic advisor are assigned immediately after a student is admitted to a program (with possible adjustments if there are more interested students than available space in respective modules).
2) Each student must develop a Course Registration Plan according to the purpose of their study, academic background, and learning ability while seeking due guidance and advice from the module manager of the assigned module or the academic advisor, and obtain approval.
3) Complete the enrollment within the enrollment period and submit the enrollment and study plan with the signature and seal of the academic advisor attached (refer to page 61).

4) Refer to page 6 to learn how to enroll in courses.

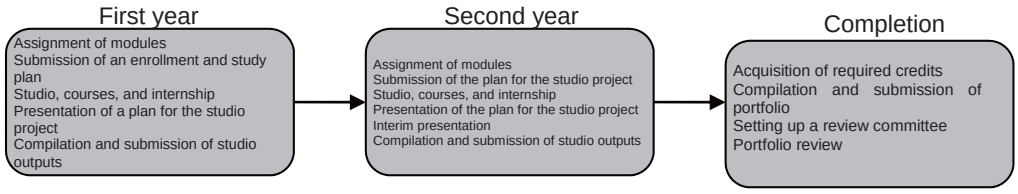
5) The Course Registration Plan must be followed through in each academic year.

6) As necessary, the Course Registration Plan must be revised properly according to the guidance and advice from the module manager of the assigned module or the advisor.

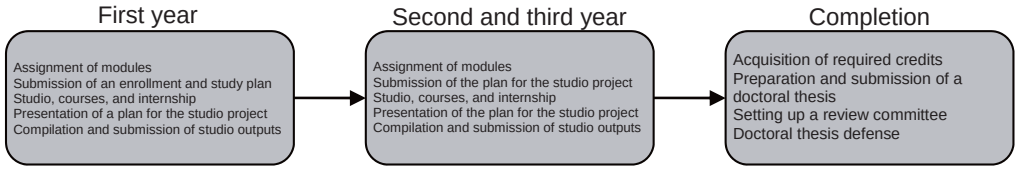
3. Flow of Study

The flow of study is outlined below.

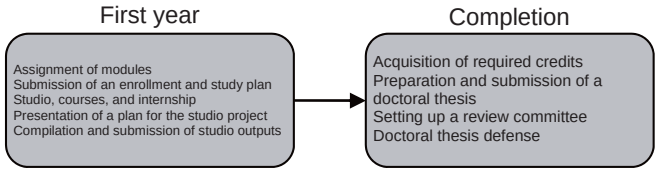
Flow of study in a master's program



Flow of study in a doctoral program



Accelerated program (mainly for working doctoral students with solid accomplishments)



4. Enrollment procedure, etc.

1) Please read "III-1 Enrollment procedure" carefully.

2) If you have any questions, contact your academic advisor, the academic affairs and library officer of the graduate school, or the Graduate School of Engineering Science Section.

3) It is necessary to obtain approval for the enrollment and study plan from your advisor before submitting it to the Graduate School of Engineering Science Section.

5. Necessary Credits and Requirements for Graduating

The number of necessary credits and other requirements for completing the master's and doctoral programs are presented in the following table.

Requirements for completing the PED Program at the Graduate School of Engineering Science

Master's programs

<table>
<tr><th colspan="2">Courses</th><th colspan="2">Necessary number of credits</th></tr>
<tr><td rowspan="2">School-wide core courses</td><td>Information course group
Science course group
Engineering course group</td><td>• At least 2 credits from information course group</td><td rowspan="2">At least 6 credits</td></tr>
<tr><td>Practical course group</td><td>• 2 credits required from Presentation English</td></tr>
<tr><td colspan="2">Specialized module [*1,2]</td><td colspan="2">At least 4 modules (24 credits)
(Completion of 1 module requires at least 4 credits from studio courses and 2 credits from the course group that makes up the module) [*3]</td></tr>
<tr><td colspan="2">Number of necessary credits (total)</td><td colspan="2">At least 30 credits (with a GPA of 2.0 or greater)</td></tr>
</table>

*1 A studio course that makes up a specialized module (master's program) is usually conducted in one semester. In principle, only one studio course from studio course hours can be taken in one semester.

*2 Internship courses are assigned according to each assigned module in a master-level PED Program. They are conducted in close partnership with the manufacturing industry. The number of necessary credits is determined based on the internship period. Assignments are determined based on discussions between the partners and the Graduate School of Engineering Science. The school plans internship courses to accomplish the educational goals of the PED Program, so students can substitute one studio from a specialized module that is closely related to the internship assignment (pay attention to the note below marked with asterisk). For this reason, remember that an internship course that can substitute a studio course is different from any internship program carried out by students based on their free will and initiatives.

*3 The same subject cannot be used as a substitute for more than one specialized module.

* Note regarding the substitution of a studio course with an internship course

- Anyone who wishes to substitute a studio course with an internship course should register both courses during enrollment.
  [Time schedule code: N000000, Course name: Studio course (for substitution)]
- The module manager proposes the substitution of studio with internship to the academic affairs and library officer of the graduate school.
- Submit an internship report via email to the Graduate School of Engineering Science Section immediately after the completion of an internship program. After receiving the report, the Graduate School of Engineering Science Section will proceed to substitute the corresponding studio. The report template can be downloaded from the website of the Graduate School of Engineering Science.
- Any courses that substituted a studio will be marked with an "i" at the end of the course name in transcripts or the like.

* Restriction of public access to a portfolio according to the confidential agreement for internship programs

In case the submission of studio outputs and portfolios from an internship course to replace a studio course is constrained by a confidential agreement with the host company or their patent application, consult with the Graduate School of Engineering Science Section to handle the confidential agreement and other requirements individually.

Doctoral programs

Courses	Necessary number of credits
Specialized module (doctor) [*4,5]	At least 1 module (completion of 1 module requires at least 4 credits from studio courses and 2 credits from the course group that makes up the module)
Number of necessary credits (total)	At least 9 credits (with a GPA of 2.0 or greater)

*4 A doctoral thesis written and submitted to complete the Pi-type Engineering Degree (PED) Program is reviewed with respect to the candidate's level of achievement as a practice-oriented research. Similarly, the performance in a doctor-level studio course that makes up a specialized module is evaluated by a faculty group. The module will be offered until the candidate can demonstrate adequate accomplishment.

*5 For the same reason as above, an internship in the doctor-level PED Program is conducted in close partnership with the manufacturing industry until the candidate can demonstrate adequate accomplishment. The internship can substitute one studio among special modules from the candidate's doctoral program that are closely related to the internship assignment.

6. Cross-enrollment Between Master's and Doctoral Programs

Master's programs

Students of master's programs may not take courses offered in doctoral programs.

Doctoral programs

Students of doctoral programs may take specialized lecture courses offered in master's programs according to the guidance and advice from their advisors. Note however, that they cannot substitute lectures and other courses (two credits) that are needed to complete a specialized module.

7. Enrollment in Courses Offered by Other Graduate Schools or Other Universities

Master's and doctoral programs

According to the guidance and advice from their module managers and advisors, students can obtain credits by taking courses offered at the Graduate School of Engineering that are not included in their modules, and lecture courses offered at other graduate schools of YNU that are our credit transfer partners (Graduate School of Urban Innovation, Graduate School of Environment and Information Science, Graduate School of Education, and Graduate School of International Social Sciences), as well as other graduate schools from the partner universities of YNU for credit transfers.

Prior to any such enrollment, contact the Graduate School of Engineering Science Section. The enrollment cannot be made without the approval of the faculty responsible for the intended course.

8. Enrollment in Foreign Language Courses

Master's and doctoral programs

1) Credits from foreign language courses are not counted as credits required to complete a study program. However, a student who has taken courses in one foreign language (non-native) during their master's or doctoral program may be exempted from language examination during their doctoral thesis defense. The language examination is conducted for international students in a non-native language.
2) Foreign language courses are not offered at the Graduate School of Engineering Science. Consult with the Graduate School of Engineering Science Section if you wish to take introductory foreign language courses (see page 11).
3) International students can take Japanese language courses and other courses in Japanese affairs (see page 11).

9. Accelerated programs

Master's programs

A standard master's program lasts two years, but it can be completed after at least one year of enrollment if a student has conducted excellent research that was acknowledged by the faculty council to have satisfied requirements for accelerated programs.

Doctoral programs

A standard doctoral program lasts three years, but it can be completed after at least one year of enrollment if a student has conducted excellent research that was acknowledged by the faculty council to have satisfied requirements for accelerated programs.

10. Academic theses

No credits are given for a portfolio developed during the master-level PED Program nor for a doctoral thesis written during the doctor-level PED Program for obtaining a degree.

(1) Thesis defense, etc.

Students who are certain that they satisfy the requirements for completing their master's or doctoral programs must apply for a portfolio review or thesis defense. The application must be filed while they are still enrolled. Submission deadlines for applications are presented below. Students will receive notifications on the procedure and schedule for completing each program at appropriate timings from the Graduate School of Engineering Science Section through module managers or their academic advisors.

After they have successfully completed their thesis defense in their respective specializations, students must upload their final portfolios to the Learning Management System.

Master's programs	Doctoral programs
Follow the deadlines specified according to specializations	December for completion in March March for completion in June June for completion in September September for completion in December

(2) Awarded degrees and specializations

The following academic degrees are awarded according to the department in which a master's or doctoral program is completed.

Program	Department	Specialization	Degree
Master's program	Mechanical Engineering, Materials Science, and Ocean Engineering	Mechanical Engineering	Master (Engineering)
		Materials Science Frontier	Master (Engineering)
		Systems Design for Ocean-Space	Master (Engineering)
		Aerospace Engineering	Master (Engineering)
	Chemistry and Life Science	Chemistry Applications and Life Science	Master (Engineering)
	Mathematics, Physics, Electrical Engineering and Computer Science	Applied Physics	Master (Engineering)
		Information Systems	Master (Engineering)
		Electrical and Computer Engineering	Master (Engineering)
Doctoral programs	Mechanical Engineering, Materials Science, and Ocean Engineering	Mechanical Engineering	Doctor (Engineering)
		Materials Science Frontier	Doctor (Engineering)
		Systems Design for Ocean-Space	Doctor (Engineering)
	Chemistry and Life Science	Chemistry Applications and Life Science	Doctor (Engineering)
	Mathematics, Physics, Electrical Engineering and Computer Science	Applied Physics	Doctor (Engineering)
		Information Systems	Doctor (Engineering)
		Electrical and Computer Engineering	Doctor (Engineering)

(3) Evaluation standards for academic theses

Portfolios and theses papers are evaluated according to the following standards set by each department.

<table>
<tr><th></th><th>Master's programs
(portfolios)</th><th>Doctoral programs</th></tr>
<tr><td>Mechanical Engineering, Materials Science, and Ocean Engineering</td><td>1. Appropriate choice of theme and studio agenda;
2. Results of the research make a significant academic or practical contribution;
3. Results are acknowledged to have a high level of accomplishment and are reliable; and
4. The structure and expressions used in the portfolio are appropriate.</td><td rowspan="3">1. The research agenda of the thesis is useful in engineering terms or appropriate in other ways;
2. The research method in the thesis is appropriate (e.g., experiment method, calculation method, etc.);
3. Research results and consideration are appropriate, logical, and original; and
4. The structure and expressions used in the thesis are appropriate.</td></tr>
<tr><td>Chemistry and Life Science</td><td>1. Clarity and adequacy of the research theme;
2. Adequacy of the experiment method and consideration;
3. Academic significance in the research area;
4. Adequacy of the model and description of the portfolio;
5. Adequacy of literature; and
6. Consistent logical structure.</td></tr>
<tr><td>Mathematics, Physics, Electrical Engineering and Computer Science</td><td>1. The studio agenda of the portfolio is useful in engineering terms or appropriate in other ways;
2. The research method in the portfolio is appropriate (e.g., experiment method, calculation method, etc.);
3. The results and consideration from the studio project presented in the portfolio are appropriate, logical, and original; and
4. The structure and expressions used in the portfolio are adequate.</td></tr>
</table>

(4) Ethical review

Immediately before any doctoral thesis defense (a thesis revised after the preliminary review of all departments in the Graduate School of Engineering Science), the academic advisor will check that it has proper copyright protection by using iThenticate. The application is then submitted to the thesis review committee. Before the final review, the committee examines the thesis while also checking that proper consideration has been given to copyright. The committee states the review results in the doctoral thesis review report.

11. Working students

Aside from the method mentioned earlier, students admitted under the exceptional educational method stipulated in Article 14 of the Standards for the Establishment of Graduate Schools (hereinafter called "working students") will be enrolled in the following manner:

(1) Exceptions for working students of master's programs

1) Working students must attend courses full time for at least one year of the standard period for each program (two years in master's programs and three years in doctoral programs).
2) Courses are offered in the evening of working days (17:50–19:20) as an exception, although working students may also take courses offered in the daytime and all other timeslots.
3) During the mandatory full-time study for one year in a master's program, they must make an enrollment plan to acquire the necessary credits from evening classes (17:50–19:20) in order to properly conduct their master's research. In other words, during this period, daytime courses should only be taken when such courses are not offered in the evening.
4) Once admitted, they must seek guidance from their module manager or the like and develop an enrollment and study plan for two years of master's program or three years of doctoral program.
5) If it is impossible to complete the program in the standard period of study due to professional reasons, they should consider making an enrollment and study plan for three to four years of master's program or four to six years of doctoral programs.
6) Working students should declare and gain approval for any change in their enrollment and study plan made as an exception.

(2) Exceptions for working students of doctoral programs

1) Courses are offered in the evening of working days (17:50–19:20) and the weekend (7.5 classes in two days) although working students may also take courses offered in the daytime and all other timeslots.
2) Working students should declare and gain approval for any change in their enrollment and study plan made as an exception.

(3) Exceptions for making the most of available courses

Non-working students may take courses according to the abovementioned exceptions when their module managers acknowledge that there is such a need.

Course List

Notes
- Classification:「e」indicates Engineering course group, 「s」indicates Science course group, 「i」indicates Information course group and 「p」indicates Professional course group.
- Schedule code:(S) indicates Spring semester and (F) indicates Fall semester.
- Language of instruction:「J」 indicates Japanese and 「E」 indicates English

VI-1 Master's program

<T-type Engineering Degree (TED) Program, Professional Science Degree (PSD) Program, and Science Degree Program>

【core courses】

Classification	Numbering	Schedule code	Course name	Instructor	Credits	Style of class	Academic tutorials	Grade	Semester	Year	Language of instruction	Remarks
p	ESa5002	(S) N000011	Multi-diciplinary Problem Based Learning in Graduate School of Engineering Science	TAKADA HAJIME , et.al.	2	Lectures		1・2	Spring	Every	J	
p	ESa5006	(A) N00002A (B) N00002B (C) N00002C (D) N00002D (E) N00002E (F) N00002F	Presentation English	ANDO YOSHITAKA	2	Lectures		1・2	Spring・Fall	Every	E	Students from PED Program are given priorities. A lottery is held in case there are more interested students than available space. The lottery method will be explained during the orientation. (A-D : Spring semester, E-F : Fall Semester)
p	ESa4006	(A) N00003A (B) N00003B (C) N00003C (D) N00003D	Presentation English S, Basic Level	INADA MASATOSHI , et.al.	2	Lectures		1・2	Spring	Every	E	In charge of (A),(B) class: INADA MASATOSHI In charge of (C),(D) class: KAYABUKI TADASHI
p	ESa4006	(A) N00003A (B) N00003B	Presentation English F, Basic Level	INADA MASATOSHI , et.al.	2	Lectures		1・2	Fall	Every	E	In charge of (A) class: INADA MASATOSHI In charge of (C) class: KAYABUKI TADASHI
p	ESa4181	(S) N000051	Engineering Ethics for Risk Management	TAKADA HAJIME , et.al.	2	Lectures		1	Spring	Every	J	
p	ESa4004	(F) N000064	Innovation and New Business II	HANEJI NOBUO , et.al.	2	Lectures		1・2	Fall	Every	J	
p	ESa4002	(S) N000071	Project Management I	MASAKI KADONO	2	Lectures		1・2	Spring	Every	E	Students from PED Program are given priorities. A lottery is held in case there are more interested students than available space. The lottery method will be explained during the orientation.
p	ESa4002	(S) N000081	Project Management II	MASAKI KADONO	2	Lectures		1・2	Spring	Every	E	
p	ESa4002	(S) N000091	Professional Engineering I	MAKI IWAKUMA , et.al.	2	Lectures		1・2	Spring	Every	J	
p	ESa4002	(F) N000104	Professional Engineering II	MAKI IWAKUMA , et.al.	2	Lectures		1・2	Fall	Every	J	
p	ESa4002	(S) N000111	The Professional Ethics in EU&US	KITAGAWA TATSUO , et.al.	2	Lectures		1・2	Spring	Every	E	Students from PED Program are given priorities. A lottery is held in case there are more interested students than available space. The lottery method will be explained during the orientation.
p	ESa4002	(S) N000121	Effective Business Planning in Global Companies	CHOTOKU YUJI	2	Lectures		1・2	Spring	Every	J	
p	ESa4002	(S) N000131	Next Generation's Business Skills as a Global Standard	YAMAGUCHI HIROSHI	2	Lectures		1・2	Spring	Every	J	Students from PED Program are given priorities. A lottery is held in case there are more interested students than available space. The lottery method will be explained during the orientation.
p	ESa4002	(S) N000141	Innovation and Challenges I	HANEJI NOBUO , et.al.	2	Lectures		1・2	Spring	Every	J	
p	ESa4002	(S) N000151	Innovation and Challenges II	HANEJI NOBUO , et.al.	2	Lectures		1・2	Spring	Every	J	
p	ESa4002	(S) N000161	Standardization and Business	MANABU ETO , et.al.	2	Lectures		1・2	Spring	Every	J	
p	ESa4002	(S) N000171	Technological subject in Kanagawa prefecture	TAMECHIKA EMI	2	Lectures		1・2	Spring	Every	J	
p	ESa9004	(S) N009811 (F) N009814	Oversea Internship for Science Engineering	UMEHARA IZURU	2	Exercise		1・2	Spring・Fall	Every	J	
i	ESb4554	(S) NA10011	Computational Fluid Engineering	MATSUI JUN	2	Lectures		1	Spring	Every	E	
e	ESb4554	(F) NA10024	Turbulence Phenomena	NISHINO KOICHI	2	Lectures		1・2	Fall	Every	E	

Classification	Numbering	Schedule code	Course name	Instructor	Credits	Style of class	Academic tutorials	Grade	Semester	Year	Language of instruction	Remarks
s	ESb4444	(F) NA20014	Introduction to Materials for Electronics and Optoelectronics	MUKAI KOKI	2	Lectures		1・2	Fall	Every	E	
e	ESb4594	(F) NA20024	Introduction of multi-functional composites	NAKAO WATARU	2	Lectures		1・2	Fall	Every	E	
e	ESb4612	(F) NA30014	Ship Motions in Waves	HIRAKAWA YOSHIAKI	2	Lectures		1・2	Fall	Every	E	
e	ESb4612	(F) NA30024	Introduction to Ocean Resources and Energy Engineering	NISHI YOSHIKI	2	Lectures		1・2	Fall	Every	E	
i	ESf4521	(F) NB10014	Advanced Statistical Mechanics	SAKOMURA MASARU	2	Lectures		1・2	Fall	Odd	E	
i	ESf4521	(S) NB10021	Quantum theory for chemical reactions	SATO KOTA	2	Lectures		1・2	Spring	Even	E	
e	ESf4603	(S) NB10031	Catalytic Chemistry	KUBOTA YOSHIHIRO	2	Lectures		1・2	Spring	Even	E	
e	ESf4533	(F) NB10044	Design of Polymers and Polymer Systems	OYAMA TOSHIYUKI	2	Lectures		1・2	Fall	Even	E	
s	ESf4522	(F) NB10054	Organic Photochemistry	MURATA SHIGERU	2	Lectures		1・2	Fall	Even	J	
s	ESf4712	(F) NB10064	Microbial Biotechnology	kikuchi yoshimi	2	Lectures		1・2	Fall	Odd	J	
s	ESf4534	(F) NB10074	Advanced Instrumental Analysis	MAKOTO TANIMURA	2	Lectures		1・2	Fall	Every	J	
s	ESh4523	(F) NB10254	Solid State Chemistry	YABUUCHI NAOAKI	2	Lectures		1・2	Fall	Even	E	
i	ESf5565	(S) NB20011	Process Monitoring	OKAZAKI SHINJI	2	Lectures		1・2	Spring	Every	E	
e	ESf5555	(F) NB20024	Advanced Heat Transfer	OKUYAMA KUNITO , et.al.	2	Lectures		1・2	Fall	Every	E	
e	ESf5601	(S) NB20031	Advanced Transport Phenomena	AIHARA MASAHIKO	2	Lectures		1・2	Spring	Every	E	
e	ESf5537	(S) NB20043	Cutting Edge of Fuel Cell Technology	MITSUSHIMA SHIGENORI , et.al.	2	Lectures		1・2	Spring	Every	E	
s	ESj4471	(F) NC10014	Mathematical Sciences: Algebra	KAJIWARA TAKESHI	2	Lectures		1・2	Fall	Even	E	specified for specialization in Mathematical Sciences
s	ESj4472	(S) NC10021	Mathematical Sciences: Geometry	HONDA ATSUFUMI	2	Lectures		1・2	Spring	Odd	E	
s	ESj4473	(S) NC10031	Mathematical Sciences: Analysis	SHIOJI NAOKI	2	Lectures		1・2	Spring	Even	E	
i	ESj4475	(F) NC10044	Mathematical Sciences: Probability and Statistics	KONNO NORIO , et.al.	2	Lectures		1・2	Fall	Every	E	
s	ESj4475	(S) NC10051	Mathematical Sciences: Data Sciences	KUROKI MANABU	2	Lectures		1・2	Spring	Every	E	
i	ESj4494	(S) NC20011	Quantum Statistical Mechanics	KURAMOTO TETSUJI	2	Lectures		1・2	Spring	Even	E	
s	ESj4432	(S) NC20021	Nanophysics and Advanced Materials	ICHIYANAGI YUKO , et.al.	2	Lectures		1・2	Spring	Every	E	
s	ESj4493	(S) NC20031	Magneto-Science	UEHARA MASATOMO , et.al.	2	Lectures		1・2	Spring	Every	E	
s	ESj4492	(F) NC20044	Low temperature physics	SHIMAZU YOSHIHIRO	2	Lectures		1・2	Fall	Odd	E	
s	ESj4491	(S) NC20051	Astroparticle Physics	NAKAMURA SHOGO	2	Lectures		1・2	Spring	Odd	E	
s	ESj4511	(F) NC20064	Plasma Physics	TSUSHIMA AKIRA	2	Lectures		1・2	Fall	Even	E	
e	ESj4616	(F) NC30014	Energy System	FUJII YASUMASA , et.al.	2	Lectures		1・2	Fall	Even	J	
i	ESj4564	(F) NC30024	Signal Theory	SHOUKI HIROKI	2	Lectures		1・2	Fall	Every	J	
i	ESj4564	(F) NC30034	Advanced Digital Communications	KOHNO RYUJI	2	Lectures		1・2	Fall	Every	E	
e	ESj4563	(S) NC30041	VLSI System Design	YOSHIKAWA NOBUYUKI	2	Lectures		1・2	Spring	Every	E	
e	ESj4563	(F) NC30054	A Course for Advanced Electronics Products and Their Architecture	YOSHIKAWA NOBUYUKI	2	Lectures		1・2	Fall	Every	J	
i	ESj4124	(F) NC30064	Intelligent Systems	HAMAGAMI TOMOKI	2	Lectures		1・2	Fall	Every	E	
e	ESj4562	(S) NC30071	Material Integration	MATSUKI TAKEO	2	Lectures		1・2	Spring	Every	J	

Mechanical Engineering, Materials Science, and Ocean Engineering

【major courses】

Classification	Numbering	Schedule code	Course name	Instructor	Credits	Style of class	Academic tutorials	Grade	Term	Year	Language of instruction	Remarks
e	ESc5551	(S) NA10031	Advanced Strength Design	YU QIANG	2	Lectures		1・2	Spring	Every	E	
e	ESc5556	(F) NA10044	Machine Dynamics	TAKADA HAJIME	2	Lectures		1	Fall	Every	E	
i	ESc5556	(F) NA10054	System modeling and control	SANADA KAZUSHI	2	Lectures		1	Fall	Every	E	
e	ESc5555	(F) NA10064	Reactive Gas Dynamics	ISHI KAZUHIRO	2	Lectures		1・2	Fall	Every	E	
e	ESc5611	(F) NA10074	Space Propulsion Engineering	YOSHINORI TAKAO	2	Lectures		1	Fall	Every	E	
s	ESc4594	(S) NA20031	Orientation Analysis on Deformation and Fracture in Polycrystalline Material	UMEZAWA OSAMU	2	Lectures		1・2	Spring	Every	E	
e	ESc4552	(S) NA20041	Material Forming Process	MAENO TOMOYOSHI	2	Lectures		1・2	Spring	Every	E	
i	ESc5612	(F) NA30034	Exercises in Computational Hydrodynamics	HINO TAKANORI	2	Lectures		1・2	Fall	Every	E	
i	ESc5612	(S) NA30041	Exercises in Computational Structural Analysis	KAWAMURA YASUMI	2	Lectures		1・2	Spring	Every	E	
e	ESc5612	(S) NA30051	Introduction to Engineering Turbulence	YOUHEI TAKAGI	2	Lectures		1・2	Spring	Every	E	
e	ESc5611	(S) NA30061	Aerospace Utilization Engineering	HIGUCHI TAKEHIRO	2	Lectures		1・2	Spring	Every	E	

【specialized courses】

Classification	Numbering	Schedule code	Course name	Instructor	Credits	Style of class	Academic tutorials	Grade	Term	Year	Language of instruction	◎required courses, ●compulsory elective, ○specified specialized courses for each specialization			
												Mechanical Engineering (TED)	Materials Engineering (TED)	Systems Design for Ocean-Space (TED)	Aerospace Engineering (TED)
e	ESd5553	(F) NA10084	Mechatronics Design	SATO YASUKAZU	2	Lectures		1・2	Fall	Every	E	○			
e	ESd5552	(S) NA10091	Advanced High-speed Machining	SHINOZUKA JUN	2	Lectures		1	Spring	Every	E	○			
e	ESd5551	(F) NA10104	Fracture Mechanics	AKINIWA YOSHIAKI	2	Lectures		1	Fall	Every	E	○			
e	ESd5554	(S) NA10111	Rarefied Gas Dynamics	MATSUMOTO HIROAKI	2	Lectures		1	Spring	Every	E	○			
e	ESd5556	(S) NA10121	Advanced Robotics	SUGIUCHI HAJIME	2	Lectures		1	Spring	Every	E	○			
i	ESd5126	(S) NA10131	Intelligent Robotic Agents	MAEDA YUUSUKE	2	Lectures		1	Spring	Every	E	○			
e	ESd5551	(F) NA10144	Continuum Mechanics	OZAKI SHINGO	2	Lectures		1・2	Fall	Every	E	○			
e	ESd5554	(F) NA10154	Applied fluid dynamics	HYAKUTAKE TORU	2	Lectures		1	Fall	Every	E	○			
e	ESd5556	(F) NA10164	Design and Principle of Various Actuators	FUCHIWAKI OHMI	2	Lectures		1	Fall	Every	E	○			
e	ESd5436	(F) NA10174	Micromachine Engineering	MARUO SHOJI	2	Lectures		1・2	Fall	Every	E	○			
e	ESd5555	(F) NA10184	Combined Heat Transfer	SAKAI SEIGO	2	Lectures		1	Fall	Every	E	○			
e	ESd5554	(F) NA10194	Applied Thermofluid Engineering	ARAKI TAKUTO	2	Lectures		1	Fall	Every	E	○			
e	ESd5234	(F) NA10204	Cyber-Robotics	KATO RYU	2	Lectures		1・2	Fall	Every	E	○			
e	ESd5443	(F) NA10214	Sensor Engineering	HIROKI OHTA	2	Lectures		1	Fall	Every	E				
e	ESd5611	(S) NA10221	Compressible Flow	KITAMURA KEIICHI	2	Lectures		1・2	Spring	Every	E	○			○
e	ESd5616	(S) NA10231	Design of Energy Machine Systems	KABATA YASUO , et.al.	2	Lectures		1・2	Spring	Every	J				

Classification	Numbering	Schedule code	Course name	Instructor	Credits	Style of class	Academic tutorials	Grade	Term	Year	Language of instruction	◎required courses, ●compulsory elective, ○specified specialized courses for each specialization			
												Mechanical Engineering (TED)	Science Frontier (TED)	Systems Design for Ocean-Space (TED)	Aerospace Engineering (TED)
e	ESd5011	(S) NA11101 (F) NA11104	Seminar in Mechanical Engineering A	Each Instructor (Mechanical Engineering)	2	Seminars	○	1	Spring・Fall	Every	J	○			○ ※2
e	ESd5011	(S) NA11201 (F) NA11204	Seminar in Mechanical Engineering B	Each Instructor (Mechanical Engineering)	2	Seminars	○	1	Spring・Fall	Every	J	○			○
e	ESd5011	(S) NA11301 (F) NA11304	Seminar in Mechanical Engineering C	Each Instructor (Mechanical Engineering)	2	Seminars	○	2	Spring・Fall	Every	J	◎			
e	ESd5011	(S) NA11401 (F) NA11404	Seminar in Mechanical Engineering D	Each Instructor (Mechanical Engineering)	2	Seminars	○	2	Spring・Fall	Every	J	◎			
p	ESd5014	(S) NA19811 (F) NA19814	Internship in Mechanical Engineering L	Each Instructor (Mechanical Engineering)	4	Exercise		1・2	Spring・Fall	Every	J	○			○
p	ESd5014	(S) NA19821 (F) NA19824	Internship in Mechanical Engineering M	Each Instructor (Mechanical Engineering)	2	Exercise		1・2	Spring・Fall	Every	J	○ ※1			○ ※3
p	ESd5014	(S) NA19831 (F) NA19834	Internship in Mechanical Engineering S	Each Instructor (Mechanical Engineering)	1	Exercise		1・2	Spring・Fall	Every	J	○			○
e	ESd5594	(S) NA20051	Diffusional Transformations in Solids	HIROSAWA SHOICHI	2	Lectures		1・2	Spring	Every	E		○		
s	ESd5441	(F) NA20064	Solid State Physics	NAKATSUGAWA HIROSHI	2	Lectures		1・2	Fall	Every	E		○		
p	ESd5591	(F) NA20074	Advanced Materials Engineering	UMEZAWA OSAMU , et.al.	1	Lectures		1・2	Fall	Every	J		○		
e	ESd5594	(F) NA20084	Design and Engineering of High-Temperature Structural Materials	TODA YOSHIAKI	2	Lectures		1・2	Fall	Every	E		○		
s	ESd5591	(F) NA20094	Computational Modeling of Phase Transformation and Microstructure Evolution	SHIMONO MASATO	2	Lectures		1・2	Fall	Every	E		○		
e	ESd5595	(F) NA20104	Microstructure Design in Metallic Materials	MITARAI YOKO	2	Lectures		1・2	Fall	Every	E		○		
e	ESd5594	(S) NA20111	Advanced Strength and Fracture of Materials	HASEGAWA MAKOTO	2	Lectures		1・2	Spring	Every	E		○		○
e	ESd5434	(F) NA20124	Introduction to nanomaterials engineering	OHTAKE MITSURU	2	Lectures		1・2	Fall	Every	E		○		
e	ESd5595	(F) NA20134	Advanced structural materials: design and application	FUNAKAWA YOSHIMASA , et.al.	2	Lectures		1・2	Spring	Every	E		○		
e	ESd5021	(S) NA21101 (F) NA21104	Exercise in Materials Engineering A	UMEZAWA OSAMU , et.al.	2	Seminars	○	1・2	Spring・Fall	Every	J		○		○ ※2
e	ESd5021	(S) NA21201 (F) NA21204	Exercise in Materials Engineering B	UMEZAWA OSAMU , et.al.	2	Seminars	○	1・2	Spring・Fall	Every	J		○		○
e	ESd5021	(S) NA21301 (F) NA21304	Exercise in Materials Engineering C	UMEZAWA OSAMU , et.al.	2	Seminars	○	1・2	Spring・Fall	Every	J		◎		
e	ESd5021	(S) NA21401 (F) NA21404	Exercise in Materials Engineering D	UMEZAWA OSAMU , et.al.	2	Seminars	○	1・2	Spring・Fall	Every	J		◎		
p	ESd5024	(S) NA29811 (F) NA29814	Internship in Materials Engineering L	UMEZAWA OSAMU , et.al.	4	Exercise		1・2	Spring・Fall	Every	J		○		○
p	ESd5024	(S) NA29821 (F) NA29824	Internship in Materials Engineering M	UMEZAWA OSAMU , et.al.	2	Exercise		1・2	Spring・Fall	Every	J		○ ※1		○ ※3
p	ESd5024	(S) NA29831 (F) NA29834	Internship in Materials Engineering S	UMEZAWA OSAMU , et.al.	1	Exercise		1・2	Spring・Fall	Every	J		○		○
e	ESd5612	(S) NA30071	Ship and Marine Structural Design Methodologies	OKADA TETSUO	2	Lectures		1・2	Spring	Every	E			○	
e	ESd4612	(F) NA30084	Theory in Dynamics of Floating Bodies Engineering	MURAI MOTOHIKO	2	Lectures		1・2	Fall	Every	E			○	
e	ESd5612	(S) NA30091	Engineering for Ocean Development	KATOH SYUNJI , et.al.	2	Lectures		1・2	Spring	Even	E			○	
e	ESd5612	(S) NA30101	Maritime Traffic Safety	FUKUTO JUNJI , et.al.	2	Lectures		1・2	Spring	Odd	E			○	
e	ESd5612	(F) NA30114	Rule Making Procedures through Risk-Based Approaches	YOSHIDA KOICHI , et.al.	2	Lectures		1・2	Fall	Every	E			○	
e	ESd5612	(S) NA30121	Advanced Study of the Ocean Industry	TAKASHINA JYUNSHI	2	Lectures		1・2	Spring	Every	E			○	
e	ESd5612	(S) NA30131 (F) NA30134	Special Lecture on Ocean and Space Engineering A	UENO SEIYA , et.al.	1	Lectures		1・2	Spring・Fall	Every	E			○	

Classification	Numbering	Schedule code	Course name	Instructor	Credits	Style of class	Academic tutorials	Grade	Term	Year	Language of instruction	◎required courses, ●compulsory elective, ○specified specialized courses for each specialization			
												Mechanical Engineering (TED)	Science Frontier (TED)	Systems Design for Ocean-Space (TED)	Aerospace Engineering (TED)
e	ESd5612	(S) NA30141 (F) NA30144	Special Lecture on Ocean and Space Engineering B	UENO SEIYA , et.al.	1	Lectures		1・2	Spring・Fall	Every	E			○	
e	ESd5612	(S) NA30151 (F) NA30154	Special Lecture on Ocean and Space Engineering C	UENO SEIYA , et.al.	1	Lectures		1・2	Spring・Fall	Every	E			○	
e	ESd5612	(S) NA30161 (F) NA30164	Special Lecture on Ocean and Space Engineering D	UENO SEIYA , et.al.	1	Lectures		1・2	Spring・Fall	Every	E			○	
e	ESd4612	(S) NA30171	BJ Collaborative Special lecture on Naval Architecture and Offshore Engineering A	MURAI MOTOHIKO , et.al.	4	Lectures		1・2	Spring	Every	E			○	
e	ESd4612	(S) NA30181	BJ Collaborative Special lecture on Naval Architecture and Offshore Engineering B	MURAI MOTOHIKO , et.al.	2	Lectures		1・2	Spring	Every	E			○	
e	ESd4612	(F) NA30194	BJ Collaborative Special lecture on Naval Architecture and Offshore Engineering C	MURAI MOTOHIKO , et.al.	4	Lectures		1・2	Fall	Every	E			○	
e	ESd4612	(F) NA30204	BJ Collaborative Special lecture on Naval Architecture and Offshore Engineering D	MURAI MOTOHIKO , et.al.	2	Lectures		1・2	Fall	Every	E			○	
e	ESd5611	(F) NA30214	Optimal Astrodynamics	UENO SEIYA	2	Lectures		1・2	Fall	Every	E			○	○
e	ESd5611	(F) NA30224	Aircraft Aerodynamic Design	MIYAJI KOJI	2	Lectures		1・2	Fall	Every	E			○	○
e	ESd5611	(S) NA30231	Space Environment Utilization Science	NATSUISAKA MAKOTO	2	Lectures		1・2	Spring	Every	E			○	○
e	ESd5611	(S) NA30241	Advanced theory of space system	ITO YASUYUKI	2	Lectures		1・2	Spring	Every	E			○	○
e	ESd4612	(F) NA30254	Systems Engineering Theory of Ship Design	MITSUYUKI TAIGA	2	Lectures		1・2	Fall	Every	E				
e	ESd5031	(S) NA31101 (F) NA31104	Exercise in Ocean and Space Engineering System A	Each Instructor , et.al.	2	Seminars	○	1	Spring・Fall	Every	J			○	○ ※2
e	ESd5031	(S) NA31201 (F) NA31204	Exercise in Ocean and Space Engineering System B	Each Instructor , et.al.	2	Seminars	○	1	Spring・Fall	Every	J			○	○
e	ESd5031	(S) NA31301 (F) NA31304	Exercise in Systems Design for Ocean-Space C	Each Instructor	2	Seminars	○	2	Spring・Fall	Every	J			◎	
e	ESd5031	(S) NA31401 (F) NA31404	Exercise in Systems Design for Ocean-Space D	Each Instructor	2	Seminars	○	2	Spring・Fall	Every	J			◎	
p	ESd5034	(S) NA31501 (F) NA31504	Industrial Training in Ocean and Space System Engineering	Each Instructor , et.al.	2	Seminars		1・2	Spring・Fall	Every	J			○	○
p	ESd5034	(S) NA31601 (F) NA31604	Overseas Training in Marine and Space System Engineering	Each Instructor , et.al.	2	Seminars		1・2	Spring・Fall	Every	E			○	○
p	ESd5034	(S) NA31701 (F) NA31704	Practical Engineering Training in Ocean-Space	Each Instructor , et.al.	4	Seminars		1・2	Spring・Fall	Every	J			○	
p	ESd5034	(S) NA31801 (F) NA31804	Practical Training in Ocean and Space System Engineering	Each Instructor , et.al.	4	Seminars		1・2	Spring・Fall	Every	J			○	○
p	ESd5034	(S) NA39811 (F) NA39814	Inntership in Ocean and Space System Engineering L	Each Instructor , et.al.	4	Exercise		1・2	Spring・Fall	Every	E			○	○
p	ESd5034	(S) NA39821 (F) NA39824	Inntership in Ocean and Space System Engineering M	Each Instructor , et.al.	2	Exercise		1・2	Spring・Fall	Every	E			○ ※1	○ ※3
p	ESd5034	(S) NA39831 (F) NA39834	Inntership in Ocean and Space System Engineering S	Each Instructor , et.al.	1	Exercise		1・2	Spring・Fall	Every	E			○	○
e	ESd5041	(S) NA41101 (F) NA41104	Exercise in Aerospace Engineering C	Each Instructor of Aerospace Engineering	2	Seminars	○	2	Spring・Fall	Every	E			○	◎
e	ESd5041	(S) NA41201 (F) NA41204	Exercise in Aerospace Engineering D	Each Instructor of Aerospace Engineering	2	Seminars	○	2	Spring・Fall	Every	E			○	◎

※1：Only one of these courses can be taken. Consult with your academic advisor or the academic affairs officer regarding your intended enrollment.

※2：Research guidance course.

Students specializing in aerospace engineering can take only one of the combinations of [Seminar in Mechanical Engineering A / Seminar in Mechanical Engineering B], [Exercise in Materials Engineering A / Exercise in Materials Engineering B], and [Exercise in Ocean and Space Engineering System A and Exercise in Ocean and Space Engineering System B].

※3：Consult with your academic advisor or the academic affairs officer regarding your intended enrollment.Only one of the nine courses can be taken.

Chemistry and Life Science

【major courses】

Classification	Numbering	Schedule code	Course name	Instructor	Credits	Style of class	Academic tutorials	Grade	Term	Year	Language of instruction	Remarks
s	ESg5521	(S) NB10081	Photophysics and Photochemistry	KIKUCHI AZUSA	2	Lectures		1・2	Spring	Even	E	
s	ESg5674	(S) NB10091	Biophysical Chemistry	KAWAMURA IZURU	2	Lectures		1・2	Spring	Even	E	
s	ESg5523	(F) NB10104	Metal Coordination Chemistry	YOSHITAKA YAMAGUCHI	2	Lectures		1・2	Fall	Odd	E	
s	ESg5544	(S) NB10111	Advanced Study on Career Design (PSD)	FUJIWARA YUTA , et.al.	2	Lectures		1・2	Spring	Every	J	
e	ESg5537	(F) NB10124	Chemistry of Electron Transfer Reactions	WATANABE MASAYOSHI	2	Lectures		1・2	Fall	Even	E	
e	ESg5544	(F) NB10134	Applied Electrochemistry	DOKKO KAORU	2	Lectures		1・2	Fall	Odd	E	
e	ESg5603	(S) NB10141	Catalytic reaction engineering	INAGAKI SATOSHI	2	Lectures		1・2	Spring	Odd	E	
e	ESg5537	(S) NB20051	Basic Energy Chemistry	MITSUSHIMA SHIGENORI , et.al.	2	Lectures		1・2	Spring	Every	E	
e	ESg5531	(F) NB20064	Materials Science for Energy Conversion	MATSUZAWA KOICHI	2	Lectures		1・2	Fall	Every	E	
s	ESg5671	(S) NB20071	Functional Genome Science	KURIHARA YASUYUKI	2	Lectures		1・2	Spring	Every	E	
e	ESg5551	(F) NB20084	Materials for Strength Components	TAKAHASHI KOJI	2	Lectures		1・2	Fall	Odd	E	
e	ESg5601	(F) NB20094	Fluid Chemical Engineering	KAMINOYAMA MEGURU	2	Lectures		1・2	Fall	Every	E	
e	ESg5601	(F) NB20104	Environmental Separation Engineering	NAKAMURA KAZUHO	2	Lectures		1・2	Fall	Every	E	
e	ESg5537	(F) NB20114	Introduction to Energy Value Chain System	MUGIKURA YOSHIHIRO	2	Lectures		1・2	Fall	Every	J	
e	ESg5602	(F) NB20124	Fuel Cell Technology	MORITA HIROSHI	2	Lectures		1・2	Fall	Every	J	
e	ESg5537	(S) NB20131	Ceramics and Energy Technologies	YAMAMOTO TOHRU	2	Lectures		1・2	Spring	Every	J	
e	ESg5676	(S) NB20141	Developmental Engineering	SUZUKI ATSUSHI	2	Lectures		1・2	Spring	Every	E	

【specialized courses】

Classification	Numbering	Schedule code	Course name	Instructor	Credits	Style of class	Academic tutorials	Grade	Term	Year	Language of instruction	◎required courses, ●compulsory elective, ○specified specialized courses for each specialization			
												Chemistry (PSD)	Applied Chemistry (TED)	Chemistry Applications and Life Science (TED)	Energy and Sustainable Chemistry (TED)
e	ESh5532	(S) NB10151	Advanced Course on Organic Electrochemistry	ATOBE MAHITO	2	Lectures		1・2	Spring	Odd	E	○	○	○	○
e	ESh5522	(S) NB10161	Chemistry of Inter-element Linkage	MINATO MAKOTO	2	Lectures		1・2	Spring	Even	E	○	○		○
e	ESh5531	(S) NB10171	Chemistry of Photoreactive Materials	UBUKATA TAKASHI	2	Lectures		1・2	Spring	Odd	E	○	○		○
e	ESh5592	(F) NB10184	Ceramic Materials Engineering	TATAMI JUNICHI	1	Lectures		1・2	Fall	Every	E	○	○		○
e	ESh5601	(F) NB10194	Powder Processing and Materials Engineering	IIJIMA MOTOYUKI	1	Lectures		1・2	Fall	Every	E	○	○		○
s	ESh5522	(S) NB10201	Advanced Physical Organic Chemistry	GOTO HIROAKI	2	Lectures		1・2	Spring	Odd	E	○	○		○
s	ESh5672	(F) NB10214	Structural Biology	CHOJIRO KOJIMA	2	Lectures		1・2	Fall	Odd	E	○	○		○
s	ESh5507	(S) NB10221	Chemical Astrobiology	KOBAYASHI KENSEI , et.al.	2	Lectures		1・2	Spring	Even	E	○	○		○
s	ESh5521	(S) NB10231	Chemical Reaction Dynamics	SEKI KANEKAZU	2	Lectures		1・2	Spring	Odd	E	○	○		○
0	ESh5532	(S) NB10241	Fine Synthetic Organic Chemistry	ITO SUGURU	2	Lectures		1・2	Spring	Odd	E	○	○		○

Classification	Numbering	Schedule code	Course name	Instructor	Credits	Style of class	Academic tutorials	Grade	Term	Year	Language of instruction	◎required courses, ●compulsory elective, ○specified specialized courses for each specialization			
												Chemistry (PSD)	Applied Chemistry (TED)	Chemistry Applications and Life Science (TED)	Energy and Sustainable Chemistry (TED)
e,s	ESh5012	(S) NB11101	Exercise in Chemistry S	Each Instructor of Chemistry	2	Seminars		1	Spring	Every	J	◎	◎		● ※2①
e,s	ESh5012	(F) NB11204	Exercise in Chemistry F	Each Instructor of Chemistry	2	Seminars		1	Fall	Every	J	◎	◎		●
s	ESh5011	(S) NB11301	Exercise in Chemistry S (PSD)	Each Instructor of Chemistry	2	Seminars	○	2	Spring	Every	J	◎			
s	ESh5011	(F) NB11404	Exercise in Chemistry F (PSD)	Each Instructor of Chemistry	2	Seminars	○	2	Fall	Every	J	◎			
s	ESh5015	(F) NB11504	Advanced Laboratory in Chemistry (PSD)	Each Instructor of Chemistry	2	Exercise		1･2	Fall	Every	J	○			
s	ESh5015	(S) NB11601	Off-Campus Exercise in Chemistry (PSD)	Each Instructor of Chemistry	2	Exercise		1･2	Spring	Every	J	○			
p	ESh5015	(S) NB11701	Exercise for Effective Presentation in Chemistry (PSD)	Each Instructor of Chemistry	1	Exercise		2	Spring	Every	J	◎			
e	ESh5021	(S) NB11801	Exercise in Chemistry S (TED)	Each Instructor of Applied Chemistry	2	Seminars	○	2	Spring	Every	J		◎		
e	ESh5021	(F) NB11904	Exercise in Chemistry F (TED)	Each Instructor of Applied Chemistry	2	Seminars	○	2	Fall	Every	J		◎		
e	ESh5025	(F) NB12004	Advanced Laboratory in Chemistry (TED)	Each Instructor of Chemistry	2	Exercise		1･2	Fall	Every	J		○		○
e	ESh5024	(S) NB12101	Off-Campus Exercise in Chemistry (TED)	Each Instructor of Chemistry	2	Exercise		1･2	Spring	Every	J		○		○
p	ESh5025	(S) NB12201	Exercise for Effective Presentation in Chemistry (TED)	Each Instructor of Chemistry	1	Exercise		2	Spring	Every	J		◎		● ※2
e	ESh5031	(S) NB12301	Exercise in Energy and Sustainable Chemistry BS	ATOBE MAHITO , et.al.	2	Seminars	○	2	Spring	Every	J				● ※2①
e	ESh5031	(F) NB12404	Exercise in Energy and Sustainable Chemistry BF	ATOBE MAHITO , et.al.	2	Seminars	○	2	Fall	Every	J				●
p	ESh5024	(S) NB19811 (F) NB19814	Internship in Chemistry L	Each Instructor of Chemistry	4	Exercise		1･2	Spring･Fall	Every	J	○	○		○
p	ESh5024	(S) NB19821 (F) NB19824	Internship in Chemistry M	Each Instructor of Chemistry	2	Exercise		1･2	Spring･Fall	Every	J	○ ※1	○ ※1		○ ※1
p	ESh5024	(S) NB19831 (F) NB19834	Internship in Chemistry S	Each Instructor of Chemistry	1	Exercise		1･2	Spring･Fall	Every	J	○	○		○
p	ESh5024	(S) NB19841 (F) NB19844	Oversea Internship in Chemistry L	Each Instructor of Chemistry	4	Exercise		1･2	Spring･Fall	Every	E	○	○		○
p	ESh5024	(S) NB19851 (F) NB19854	Oversea Internship in Chemistry M	Each Instructor of Chemistry	2	Exercise		1･2	Spring･Fall	Every	E	○ ※1	○ ※1		○ ※1
p	ESh5024	(S) NB19861 (F) NB19864	Oversea Internship in Chemistry S	Each Instructor of Chemistry	1	Exercise		1･2	Spring･Fall	Every	E	○	○		○
e	ESh5221	(S) NB20151	Risk Analysis	SUYAMA KOICHI , et.al.	2	Lectures		1･2	Spring	Every	J			○	○
e	ESh5181	(F) NB20164	Recurrent Education for Engineering	OKAZAKI SHINJI	2	Lectures		1･2	Fall	Every	E			○	○
e	ESh5601	(F) NB20174	Mixing for Chemical Engineering	KAMINOYAMA MEGURU	2	Lectures		1･2	Fall	Every	E			○	○
e	ESh5602	(S) NB20181	Material Production Technology	HABUKA HITOSHI	2	Lectures		1･2	Spring	Every	E			○	○
e	ESh5712	(S) NB20191	Microbial Biotechnology	TAKEDA MINORU	2	Lectures		1･2	Spring	Every	E			○	○
e	ESh5231	(F) NB20204	Medical Engineering	FUKUDA JUNJI	2	Lectures		1･2	Fall	Odd	E			○	○
p	ESh5602	(F) NB20214	Technology-Development & Society	KEIKO FUJIOKA , et.al.	2	Lectures		1･2	Fall	Every	J			○	○
e	ESh5536	(S) NB20221	Physical Chemistry for Environmental Sciences	YOSHITAKE HIDEAKI	2	Lectures		1･2	Spring	Every	E			○	○
p	ESh5049	(S) NB20231	Problem-Based Learning in Chemistry Applications and Life Science	Each Instructor , et.al.	2	Lectures		1･2	Spring	Every	J			○	○
i	ESh5602	(S) NB20241	Simulation for Chemical Processes	YAMAMOTO HIROSHI , et.al.	2	Lectures		1･2	Spring	Every	J			○	○
e	ESh5593	(F) NB20254	Functional Materials Science	KANAI TOSHIMITSU	2	Lectures		1･2	Fall	Even	E			○	○

Classification	Numbering	Schedule code	Course name	Instructor	Credits	Style of class	Academic tutorials	Grade	Term	Year	Language of instruction	◎required courses, ●compulsory elective, ○specified specialized courses for each specialization				
												Chemistry (PSD)	Applied Chemistry (TED)	Chemistry Applications and Life Science (TED)	Energy and Sustainable Chemistry (TED)	
e	ESh5604	(S) NB20261	Tissue Engineering and Regenerative Medicine	FUKUDA JUNJI	2	Lectures		1・2	Spring	Odd	E			○	○	
e	ESh5551	(S) NB20271	Materials Engineering for Machinery and Apparatus	TAKAHASHI KOJI	2	Lectures		1・2	Spring	Even	E			○	○	
e	ESh5042	(S) NB21101	Seminar A in Chemistry Applications and Life Science	Each Instructor , et.al.	2	Seminars		1	Spring	Every	J			◎	●	※2 ②
e	ESh5042	(F) NB21204	Seminar B in Chemistry Applications and Life Science	Each Instructor , et.al.	2	Seminars		1	Fall	Every	J			◎	●	
e	ESh5042	(S) NB21301	Seminar C in Chemistry Applications and Life Science	OKUYAMA KUNITO , et.al.	2	Seminars	○	2	Spring	Every	J			◎		
e	ESh5042	(F) NB21404	Seminar D in Chemistry Applications and Life Science	OKUYAMA KUNITO , et.al.	2	Seminars	○	2	Fall	Every	J			◎		
e	ESh5045	(F) NB21504	Advanced Laboratory in Chemistry Applications and Life Science	Each Instructor , et.al.	2	Exercise		1・2	Fall	Every	J			○	○	
e	ESh5045	(S) NB21601	Off-Campus Exercise in Chemistry Applications and Life Science	Each Instructor , et.al.	2	Exercise		1・2	Spring	Every	J			○	○	
e	ESh5032	(S) NB21701	Seminar AS in Energy Chemistry	OKAZAKI SHINJI , et.al.	2	Seminars	○	2	Spring	Every	J			○	●	※2 ②
e	ESh5032	(F) NB21804	Seminar AF in Energy Chemistry	OKAZAKI SHINJI , et.al.	2	Seminars	○	2	Fall	Every	J			○	●	
p	ESh5044	(S) NB29811 (F) NB29814	Internship L in Chemistry Applications and Life Science	Each Instructor , et.al.	4	Exercise		1・2	Spring・Fall	Every	J			○	○	
p	ESh5044	(S) NB29821 (F) NB29824	Internship M in Chemistry Applications and Life Science	Each Instructor , et.al.	2	Exercise		1・2	Spring・Fall	Every	J			○	○	※1
p	ESh5044	(S) NB29831 (F) NB29834	Internship S in Chemistry Applications and Life Science	Each Instructor , et.al.	1	Exercise		1・2	Spring・Fall	Every	J			○	○	

※1：Only one of these courses can be taken. Consult with your academic advisor or the academic affairs officer regarding your intended enrollment.

※2：Students must acquire ①【Exercise in Chemistry S / F , Exercise in Energy and Sustainable Chemistry BS / BF】 or

②【Seminar A in Chemistry Applications and Life Science, Seminar B in Chemistry Applications and Life Science, Seminar AS in Energy Chemistry, Seminar AF in Energy Chemistry】.

The students who takes【Exercise in Energy and Sustainable Chemistry BS】and【Exercise in Energy and Sustainable Chemistry BS】must acquire【Exercise for Effective Presentation in Chemistry (TED) 】.

It is not possible to take both of ① and ②.

Mathematics, Physics, Electrical Engineering and Computer Science

【major courses】

Classification	Numbering	Schedule code	Course name	Instructor	Credits	Style of class	Academic tutorials	Grade	Term	Year	Language of instruction	Remarks
s	ESk5471	(F) NC10064	Advanced Mathematical Sciences: Algebra	KAJIWARA TAKESHI	2	Lectures		1・2	Fall	Odd	E	specified for specialization in Mathematical Sciences
s	ESk5472	(S) NC10071	Advanced Mathematical Sciences: Geometry	HONDA ATSUFUMI	2	Lectures		1・2	Spring	Even	E	
s	ESk5473	(S) NC10081	Advanced Mathematical Sciences: Analysis	SHIOJI NAOKI	2	Lectures		1・2	Spring	Odd	E	
s	ESk5475	(S) NC10091	Advanced Mathmatical Sciences: Probability A	KONNO NORIO	2	Lectures		1・2	Spring	Even	E	
s	ESk5475	(F) NC10104	Advanced Mathematical Sciences: Probability B	TAKEI MASATO	2	Lectures		1・2	Fall	Odd	E	
s	ESk5475	(F) NC10114	Advanced Mathematical Sciences: Statistics	KUROKI MANABU	2	Lectures		1・2	Fall	Even	E	
i	ESk4432	(S) NC20071	Quantum Information Physics	KOSAKA HIDEO , et.al.	2	Lectures		1・2	Spring	Every	E	
s	ESk4492	(F) NC20084	Introduction to Advanced Laser Spectroscopy	TAKEDA JUN , et.al.	2	Lectures		1・2	Fall	Every	E	
s	ESk4495	(S) NC20091	Introduction to Precision Laser Spectroscopy	KOH HOURAI	2	Lectures		1・2	Spring	Odd	E	
s	ESk4493	(S) NC20101	Many Electron Theory	OONO KAORU , et.al.	2	Lectures		1・2	Spring	Every	E	
s	ESk4491	(F) NC20114	Introduction to Neutrino Physics	MINAMINO AKIHIRO	2	Lectures		1・2	Fall	Odd	E	
s	ESk9023	(S) NC21101 (F) NC21104	Seminar for Physical Education	OONO KAORU , et.al.	2	Seminars		1・2	Spring・Fall	Every	J	The course is intended for students who want to acquire a teaching license in mathematics. The course is not required to complete the program.
s	ESk9022	(S) NC21201 (F) NC21204	Practice for Physical Education	OONO KAORU , et.al.	2	Seminars		1・2	Spring・Fall	Every	J	
i	ESk4564	(F) NC30084	Coding Theory	OCHIAI HIDEKI	2	Lectures		1・2	Fall	Every	E	
i	ESk4565	(S) NC30091	Digital Circuit Theory	ICHIGE KOICHI	2	Lectures		1・2	Spring	Every	E	
s	ESk4432	(S) NC30101	Nano photonics	NISHIJIMA YOSHIAKI	2	Lectures		1・2	Spring	Every	E	
e	ESk4566	(F) NC30114	Advanced Discrete Systems	FUJIMOTO YASUTAKA	2	Lectures		1・2	Fall	Every	E	
s	ESk4444	(S) NC30121	Photonics Theory	BABA TOSHIHIKO	2	Lectures		1・2	Spring	Every	E	

【specialized courses】Mathematical Sciences

Classification	Numbering	Schedule code	Course name	Instructor	Credits	Style of class	Academic tutorials	Grade	Term	Year	Language of instruction	●compulsory elective, ○specified specialized courses for each specialization	Remarks
s	ESI5013	(S) NC11101	Seminar in Mathematical Sciences A	KAJIWARA TAKESHI , et.al.	2	Seminars		1	Spring	Every	J	○	
s	ESI5013	(F) NC11204	Seminar in Mathematical Sciences B	KAJIWARA TAKESHI , et.al.	2	Seminars		1	Fall	Every	J	○	
s	ESI5013	(S) NC11301	Seminar in Mathematical Sciences C	KAJIWARA TAKESHI , et.al.	2	Seminars		2	Spring	Every	J	○	
s	ESI5013	(F) NC11404	Seminar in Mathematical Sciences D	KAJIWARA TAKESHI , et.al.	2	Seminars		2	Fall	Every	J	○	
s	ESI5011	(S) NC11501	Exercises in Mathematical Sciences A	KAJIWARA TAKESHI , et.al.	2	Seminars	○	1	Spring	Every	J	●	Required at least 4 credits.
s	ESI5011	(F) NC11604	Exercises in Mathematical Sciences B	KAJIWARA TAKESHI , et.al.	2	Seminars	○	1	Fall	Every	J	●	
s	ESI5011	(S) NC11701	Exercises in Mathematical Sciences C	KAJIWARA TAKESHI , et.al.	2	Seminars	○	2	Spring	Every	J	●	
s	ESI5011	(F) NC11804	Exercises in Mathematical Sciences D	KAJIWARA TAKESHI , et.al.	2	Seminars	○	2	Fall	Every	J	●	

Classification	Numbering	Schedule code	Course name	Instructor	Credits	Style of class	Academic tutorials	Grade	Term	Year	Language of instruction	●compulsory elective, ○specified specialized courses for each specialization	Remarks
s	ESI5014	(S) NC11901 (F) NC11904	Training in Mathematical Sciences	KAJIWARA TAKESHI , et.al.	2	Exercise		1・2	Spring・Fall	Every	J	○	
s	ESI4012	(S) NC12001	Exercises on Algebra	KAJIWARA TAKESHI	2	Seminars		1・2	Spring	Even	J		The course is intended for students who want to acquire a teaching license in mathematics. The course is not required to complete the program.
s	ESI4012	(F) NC12104	Exercises on Geometry	HONDA ATSUFUMI	2	Seminars		1・2	Fall	Even	J		
s	ESI4012	(F) NC12204	Exercises on Analysis	SHIOJI NAOKI	2	Seminars		1・2	Fall	Even	J		
s	ESI4012	(S) NC12301	Exercises on Probability Theory	TAKEI MASATO	2	Seminars		1・2	Spring	Odd	J		
s	ESI4012	(F) NC12404	Exercises on Statistics	KONNO NORIO	2	Seminars		1・2	Fall	Odd	J		
s	ESI4012	(S) NC12501	Exercises on Computational Mathematics	KAJIWARA TAKESHI	2	Seminars		1・2	Spring	Odd	J		

【specialized courses】Physics

Classification	Numbering	Schedule code	Course name	Instructor	Credits	Style of class	Academic tutorials	Grade	Term	Year	Language of instruction	◎required courses, ●compulsory elective, ○specified specialized courses for each specialization	Remarks
s	ESI5493	(F) NC20124	Heavy Fermion Physics	UMEHARA IZURU	2	Lectures		1・2	Fall	Even	E	○	
s	ESI5443	(F) NC20134	Surface Science	SHUDO KENICHI , et.al.	2	Lectures		1・2	Fall	Every	E	○	
s	ESI5442	(F) NC20144	Symmetry and Group Theory in Crystals	SEKIYA TAKAO	2	Lectures		1・2	Fall	Odd	E	○	
s	ESI5446	(S) NC20151	High Energy Physics	KATAYOSE YUSAKU	2	Lectures		1・2	Spring	Even	E	○	
s	ESI5494	(S) NC20161	Nonlinear Science	ISHIWATA SHINGO	2	Lectures		1・2	Spring	Even	E	○	
s	ESI5493	(S) NC20173	Current Topics in Advanced Physics	SUZUKI YOSHISHIGE	2	Lectures		1・2	Spring	Every	J	○	
s	ESI5494	(S) NC20183	Current Topics in Modern Physics	KATSURA HOSHO	2	Lectures		1・2	Fall	Every	J	○	
p	ESI5022	(通) NC20194	Career-Design in Physics	UMEHARA IZURU , et.al.	2	Lectures		1		Every	J	○	
p	ESI5491	(S) NC20201	Current Topics in Physics Frontier	KATORI TEPPEI	2	Lectures		1・2	Spring	Every	J		
s	ESI5021	(S) NC21301	Exercise in Physics, A	Each Instructor of Physics	2	Seminars	○	1	Spring	Every	J	●	Required at least 4 credits.
s	ESI5021	(F) NC21404	Exercise in Physics, B	Each Instructor of Physics	2	Seminars	○	1	Fall	Every	J	●	
s	ESI5021	(S) NC21501	Exercise in Physics, C	Each Instructor of Physics	2	Seminars	○	2	Spring	Every	J	●	
s	ESI5021	(F) NC21604	Exercise in Physics, D	Each Instructor of Physics	2	Seminars	○	2	Fall	Every	J	●	
s	ESI5022	(S) NC21701	PSD Seminar in Physics, A	Each Instructor of Physics	2	Seminars		1・2	Spring	Every	J	○	
s	ESI5022	(F) NC21804	PSD Seminar in Physics, B	Each Instructor of Physics	2	Seminars		1・2	Fall	Every	J	○	
p	ESI5025	(通) NC21904	Presentation Practice in Physics	Each Instructor of Physics	1	Exercise		1		Every	E	◎	
p	ESI5024	(S) NC29811 (F) NC29814	Internships in Physics, L	Each Instructor of Physics	4	Exercise		1・2	Spring・Fall	Every	J	○	Only one of these courses can be taken. Consult with your academic advisor or the academic affairs officer regarding your intended enrollment.
p	ESI5024	(S) NC29821 (F) NC29824	Internships in Physics, M	Each Instructor of Physics	2	Exercise		1・2	Spring・Fall	Every	J	○	
p	ESI5024	(S) NC29831 (F) NC29834	Internships in Physics, S	Each Instructor of Physics	1	Exercise		1・2	Spring・Fall	Every	J	○	

specialized courses】Applied Physics/Information Systems Engineering/Electrical and Computer Engineerin

In the specializations of Applied Physics and Electrical and Computer Engineering, at least six credits must be acquired from the engineering course group. In the specialization of Information Systems, at least six credits must be acquired from the information course group. (These six credits can be acquired from compulsory courses or compulsory elective courses as well.)

Classification	Numbering	Schedule code	Course name	Instructor	Credits	Style of class	Academic tutorials	Grade	Term	Year	Language of instruction	◎required courses, ●compulsory elective, ○specified specialized courses for each specialization			Remarks
												Applied Physics (TED)	Information Systems (TED)	Electrical and Computer Engineering (TED)	
e	ESI5561	(S) NC30131	Power System Planning	OYAMA TSUTOMU	2	Lectures		1･2	Spring	Every	E	○	○	○	
e	ESI5563	(S) NC30141	Advanced Semiconductor Physics	HANEJI NOBUO	2	Lectures		1･2	Spring	Every	E	○	○	○	
s	ESI5563	(S) NC30151	Microelectronics	HIRAKAWA KAZUHIKO	2	Lectures		1･2	Spring	Even	J	○	○	○	
s	ESI5444	(F) NC30164	Semiconductor Optoelectronics	ARAKAWA TARO	2	Lectures		1･2	Fall	Every	E	○	○	○	
i	ESI5564	(S) NC30171	Information & Communications Infrastructure	SOICHI WATANABE	2	Lectures		1･2	Spring	Every	J	○	○	○	
i	ESI5564	(F) NC30184	Multimedia Mobile Communication Networks	HIROYUKI TSUJI	2	Lectures		1･2	Fall	Every	E	○	○	○	
e	ESI5564	(S) NC30191	Microwave Engineering	KUGA NOBUHIRO	2	Lectures		1･2	Spring	Every	E	○	○	○	
i	ESI5564	(F) NC30204	Fault Tolerant Systems	TANAKA HIROKAZU	2	Lectures		1･2	Fall	Every	J	○	○	○	
s	ESI5561	(S) NC30211	Advanced Electromagnetism	HIDAKA KUNIHIKO	2	Lectures		1･2	Spring	Even	J	○	○	○	
i	ESI5112	(S) NC30221	Functional Programming	KURAMITSU KIMIO	2	Lectures		1･2	Spring	Every	E	○	○	○	
e	ESI5563	(F) NC30234	CMOS Analog Circuit Design	OGAWA ATSUSHI	2	Lectures		1･2	Fall	Every	J	○	○	○	
e	ESI5436	(S) NC30241	Integrated Nanodevices	OYA TAKAHIDE	2	Lectures		1･2	Spring	Every	E	○	○	○	
s	ESI5563	(F) NC30254	Advanced Electronic Devices	TAKEMURA YASUSHI	2	Lectures		1･2	Fall	Every	E	○	○	○	
i	ESI5131	(S) NC30261	Colloquium in Medical Engineering and Informatics Based on Information Communication	SHIMONO TOMOYUKI	2	Lectures		1･2	Spring	Every	E	○	○	○	
e	ESI5561	(S) NC30271	A Basis of Smartgrid Technology	TSUJI TAKAO	2	Lectures		1･2	Spring	Every	E	○	○	○	
s	ESI5563	(S) NC30281	Superconducting Electronics	YAMANASHI YUKI	2	Lectures		1･2	Spring	Every	E	○	○	○	
e	ESI5564	(F) NC30294	Measurement of Mobile Antenna Systems	ARAI HIROYUKI	2	Lectures		1･2	Fall	Odd	E	○	○	○	
e	ESI5561	(S) NC30301	Motion Control Systems	SHIMONO TOMOYUKI	2	Lectures		1･2	Spring	Every	E	○	○	○	
i	ESI5234	(F) NC30314	Human Factors and Ergonomics	SHIMA KEISUKE	2	Lectures		1･2	Fall	Every	E	○	○	○	
e	ESI5563	(F) NC30324	Colloquium in Applied Physics I	OYA TAKAHIDE , et.al.	2	Lectures		1	Fall	Every	E	◎			
e	ESI5563	(F) NC30334	Colloquium in Applied Physics II	OYA TAKAHIDE , et.al.	2	Lectures		2	Fall	Every	E	○			
i	ESI5111	(F) NC30344	Colloquium in Information Systems I	SHIMA KEISUKE , et.al.	2	Lectures		1	Fall	Every	E		◎		
i	ESI5111	(F) NC30354	Colloquium in Information Systems II	SHIMA KEISUKE , et.al.	2	Lectures		2	Fall	Every	E		○		
e	ESI5564	(F) NC30364	Colloquium in Electrical and Computer Engineering I	TSUJI TAKAO , et.al.	2	Lectures		1	Fall	Every	E			◎	
e	ESI5564	(F) NC30374	Colloquium in Electrical and Computer Engineering II	TSUJI TAKAO , et.al.	2	Lectures		2	Fall	Every	E			○	
e	ESI5564	(S) NC30381	Multimedia Wireless Communication Networks	RI KANHOU	2	Lectures		1･2	Spring	Every	E				
p	ESI5034	(S) NC31101	Off-Campus Exercise in Applied Physics	Each Instructor of Applied Physics , et.al.	2	Exercise		1･2	Spring	Every	J	○			
p	ESI5044	(S) NC31201	Off-Campus Exercise in Information Systems	Each Instructor , et.al.	2	Exercise		1･2	Spring	Every	J		○		
p	ESI5054	(S) NC31301	Off-Campus Exercise in Electrical and Computer Engineering	Each Instructor , et.al.	2	Exercise		1･2	Spring	Every	J			○	

Classification	Numbering	Schedule code	Course name	Instructor	Credits	Style of class	Academic tutorials	Grade	Term	Year	Language of instruction	◎required courses, ●compulsory elective, ○specified specialized courses for each specialization			Remarks
												Applied Physics (TED)	Information Systems (TED)	Electrical and Computer Engineering (TED)	
e	ESI5032	(S) NC31401	Seminar in Applied Physics A	Each Instructor of Applied Physics	2	Seminars	○	1	Spring	Every	J	● ※1			
e	ESI5032	(F) NC31504	Seminar in Applied Physics B	Each Instructor of Applied Physics	2	Seminars	○	1	Fall	Every	J	●			
e	ESI5032	(S) NC31601	Seminar in Applied Physics C	Each Instructor of Applied Physics	2	Seminars	○	2	Spring	Every	J	●			
e	ESI5032	(F) NC31704	Seminar in Applied Physics D	Each Instructor of Applied Physics	2	Seminars	○	2	Fall	Every	J	●			
i	ESI5042	(S) NC31801	Seminar in Information Systems A	Each Instructor	2	Seminars	○	1	Spring	Every	J		● ※1		
i	ESI5042	(F) NC31904	Seminar in Information Systems B	Each Instructor	2	Seminars	○	1	Fall	Every	J		●		
i	ESI5042	(S) NC32001	Seminar in Information Systems C	Each Instructor	2	Seminars	○	2	Spring	Every	J		●		
i	ESI5042	(F) NC32104	Seminar in Information Systems D	Each Instructor	2	Seminars	○	2	Fall	Every	J		●		
e	ESI5052	(S) NC32201	Seminar in Electrical and Computer Engineering A	Each Instructor	2	Seminars	○	1	Spring	Every	J			● ※1	
e	ESI5052	(F) NC32304	Seminar in Electrical and Computer Engineering B	Each Instructor	2	Seminars	○	1	Fall	Every	J			●	
e	ESI5052	(S) NC32401	Seminar in Electrical and Computer Engineering C	Each Instructor	2	Seminars	○	2	Spring	Every	J			●	
e	ESI5052	(F) NC32504	Seminar in Electrical and Computer Engineering D	Each Instructor	2	Seminars	○	2	Fall	Every	J			●	
p	ESI5034	(S) NC39811 (F) NC39814	Overseas Internships in Applied Physics L	Each Instructor of Applied Physics , et.al.	4	Exercise		1・2	Spring・Fall	Every	E	○ ※2			
p	ESI5034	(S) NC39821 (F) NC39824	Overseas Internships in Applied Physics M	Each Instructor of Applied Physics , et.al.	2	Exercise		1・2	Spring・Fall	Every	E	○			
p	ESI5034	(S) NC39831 (F) NC39834	Overseas Internships in Applied Physics S	Each Instructor of Applied Physics , et.al.	1	Exercise		1・2	Spring・Fall	Every	E	○			
p	ESI5044	(S) NC39841 (F) NC39844	Overseas Internships in Information Systems L	Each Instructor , et.al.	4	Exercise		1・2	Spring・Fall	Every	E		○ ※2		
p	ESI5044	(S) NC39851 (F) NC39854	Overseas Internships in Information Systems M	Each Instructor , et.al.	2	Exercise		1・2	Spring・Fall	Every	E		○		
p	ESI5044	(S) NC39861 (F) NC39864	Overseas Internships in Information Systems S	Each Instructor , et.al.	1	Exercise		1・2	Spring・Fall	Every	E		○		
p	ESI5054	(S) NC39871 (F) NC39874	Overseas Internships in Electrical and Computer Engineering L	Each Instructor , et.al.	4	Exercise		1・2	Spring・Fall	Every	E			○ ※2	
p	ESI5054	(S) NC39881 (F) NC39884	Overseas Internships in Electrical and Computer Engineering M	Each Instructor , et.al.	2	Exercise		1・2	Spring・Fall	Every	E			○	
p	ESI5054	(S) NC39891 (F) NC39894	Overseas Internships in Electrical and Computer Engineering S	Each Instructor , et.al.	1	Exercise		1・2	Spring・Fall	Every	E			○	

※1: Required at least 4 credits.

※1 : Only one of these courses can be taken. Consult with your academic advisor or the academic affairs officer regarding your intended enrollment.

VI-2 Doctoral programs

<T-type Engineering Degree (TED) Program, Professional Science Degree (PSD) Program, and Science Degree Program>

Mechanical Engineering, Materials Science, and Ocean Engineering

Numbering	Schedule code	Course name	Instructor	Credits	Style of class	Academic tutorials	Grade	Term	Year	Language of instruction	Night/Weekend	Remarks
ESd6553	(F) QA10014	Advanced Mechatronics Design	SATO YASUKAZU	2	Lectures		1･2	Fall	Even	E		
ESd6552	(S) QA10021	Advanced Ultra High-speed Machining	SHINOZUKA JUN	2	Lectures		1	Spring	Odd	E		
ESd6551	(F) QA10034	Advanced Lectures on Fracture Mechanics	AKINIWA YOSHIAKI	2	Lectures		1	Fall	Even	E		
ESd6554	(S) QA10041	Advanced Turbo Machinery	MATSUI JUN	2	Lectures		1･2･3	Spring	Odd	J		
ESd6554	(S) QA10051	Advanced Rarefied Gas Dynamics	MATSUMOTO HIROAKI	2	Lectures		1･2	Spring	Even	E		
ESd6557	(S) QA10061	Robotic Manipulation	MAEDA YUUSUKE	2	Lectures		1	Spring	Even	E		
ESd6611	(F) QA10074	Space Propulsion Engineering, Advanced	YOSHINORI TAKAO	2	Lectures		1･2	Fall	Odd	E		
ESd6551	(S) QA10081	Advanced Lectures on Elastoplasticity Theory	OZAKI SHINGO	2	Lectures		1･2	Spring	Odd	E		
ESd6611	(F) QA10094	Advanced Computational Fluid Dynamics	KITAMURA KEIICHI	2	Lectures		1･2	Fall	Odd	E		
ESd6551	(S) QA10101	Non-linear Structural Simulation	YU QIANG	2	Lectures		1･2	Spring	Odd	E		
ESd6436	(F) QA10114	In-depth lecture on micro manipulation	FUCHIWAKI OHMI	2	Lectures		2	Fall	Odd	E		
ESd6556	(F) QA10124	Special issues on mechanical system control	SANADA KAZUSHI	2	Lectures		1	Fall	Odd	E		
ESd6555	(F) QA10134	Thermo-Fluid Dynamics of Combustion	ISHI KAZUHIRO	2	Lectures		1･2･3	Fall	Even	E		
ESd6554	(F) QA10144	Topics on Applied fluid dynamics	HYAKUTAKE TORU	2	Lectures		1･2	Fall	Even	E		
ESd6554	(S) QA10151	Turbulence Measurement	NISHINO KOICHI	2	Lectures		1･2･3	Spring	Even	E		
ESd6436	(S) QA10161	Optical Microfabrication Engineering	MARUO SHOJI	2	Lectures		1･2	Spring	Even	E		
ESd6555	(S) QA10171	Advanced Combined Heat Transfer	SAKAI SEIGO	2	Lectures		1･2･3	Spring	Even	E		
ESd6554	(F) QA10184	Advanced Applied Thermofluid Engineering	ARAKI TAKUTO	2	Lectures		1･2･3	Fall	Even	E		
ESd6234	(F) QA10194	Advanced Cyber-Robotics	KATO RYU	2	Lectures		1･2	Fall	Odd	E		
ESd6443	(F) QA10204	Advanced Thin Film Fabrication	HIROKI OHTA	2	Lectures		1･2	Fall	Even	E		
ESd6555	(F) QA10214	Thermal and Fluid Engineering for Electric Rotating Machinery	KABATA YASUO	2	Lectures		1･2･3	Fall	Even	J		
ESd6553	(F) QA10224	Virtual Design Engineering	IWAKI CHIKAKO	2	Lectures		1･2･3	Fall	Even	J		
ESd6552	(F) QA10234	Surface Treatment Technology	WADA KUNIHIKO	2	Lectures		1･2･3	Fall	Even	J		
ESd6011	(S) QA11101 (F) QA11104	Advanced Study in Mechanical Engineering	Each Instructor (Mechanical Engineering)	3	Seminars	○	1･2･3	Spring･Fall	Every	J		
ESd6015	(S) QA11201 (F) QA11204	Teaching Practice in Mechanical Engineering	Each Instructor (Mechanical Engineering)	1	Exercise		1･2･3	Spring･Fall	Every	J		
ESd6014	(S) QA11301 (F) QA11304	Off-Campus Exercise in Mechanical Engineering	Each Instructor (Mechanical Engineering)	1	Exercise		1･2･3	Spring･Fall	Every	J		
ESd6012	(S) QA11401 (F) QA11404	Advanced Study in Mechanical Engineering	Each Instructor (Mechanical Engineering)	1	Seminars		1･2･3	Spring･Fall	Every	J		
ESd6014	(S) QA19811 (F) QA19814	Overseas Internship in Mechanical Engineering	Each Instructor (Mechanical Engineering)	1	Exercise		1･2･3	Spring･Fall	Every	J		
ESd6562	(S) QA20011	Optical Semiconductor Technology	MUKAI KOKI	2	Lectures		1･2	Spring	Even	E		
ESd6594	(S) QA20021	Advanced Fracture Mechanics of Materials	HASEGAWA MAKOTO	2	Lectures		1･2	Spring	Even	E		
ESd6594	(S) QA20031	Special lecture of multi-functional composites	NAKAO WATARU	2	Lectures		1･2	Spring	Odd	E		
ESd6552	(F) QA20044	Advanced Material Forming Process	MAENO TOMOYOSHI	2	Lectures		1･2	Fall	Odd	E		
ESd6441	(F) QA20054	Advanced Functional Material Engineering	NAKATSUGAWA HIROSHI	2	Lectures		1･2	Fall	Odd	E		

Numbering	Schedule code	Course name	Instructor	Credits	Style of class	Academic tutorials	Grade	Term	Year	Language of instruction	Night/Weekend	Remarks
ESd6594	(F) QA20064	Fatigue of Metallic Materials	UMEZAWA OSAMU	2	Lectures		1･2	Fall	Every	E		
ESd6591	(F) QA20074	Local Equilibrium Theory	HIROSAWA SHOICHI , et.al.	2	Lectures		1･2	Fall	Even	E		
ESd6591	(F) QA20084	Leading-edge Materials Engineering	UMEZAWA OSAMU	2	Lectures		1･2	Fall	Every	J		
ESd6594	(F) QA20094	Application of Design and Engineering of High-Temperature Structural Materials	TODA YOSHIAKI	2	Lectures		1･2	Fall	Every	E		
ESd6591	(F) QA20104	Advanced Computational Modeling of Phase Transformation and Microstructure Evolution	SHIMONO MASATO	2	Lectures		1･2	Fall	Every	E		
ESd6595	(F) QA20114	Microstructure Design in Advanced Materials	MITARAI YOKO , et.al.	2	Lectures		1･2	Fall	Every	E		
ESd6443	(S) QA20121	Advanced thin film technology	OHTAKE MITSURU	2	Lectures		1･2･3	Spring	Odd	E		
ESd6021	(S) QA21101 (F) QA21104	Advanced exercise in Materials Engineering	UMEZAWA OSAMU , et.al.	3	Seminars	○	1･2･3	Spring･Fall	Every	J		
ESd6025	(S) QA21201 (F) QA21204	Teaching Practice in Materials Engineering	UMEZAWA OSAMU , et.al.	1	Exercise		1･2･3	Spring･Fall	Every	J		
ESd6024	(S) QA21301 (F) QA21304	Off-Campus Exercise in Materials Engineering	UMEZAWA OSAMU , et.al.	1	Exercise		1･2･3	Spring･Fall	Every	J		
ESd6022	(S) QA21401 (F) QA21404	Advanced Study in Materials Engineering	UMEZAWA OSAMU , et.al.	2	Seminars		1･2･3	Spring･Fall	Every	J		
ESd6024	(S) QA29811 (F) QA29814	International Internships in Materials Engineering	UMEZAWA OSAMU	1	Exercise		1･2･3	Spring･Fall	Every	E		
ESd6612	(F) QA30014	Advanced Exercises in Computational Hydrodynamics	HINO TAKANORI	2	Lectures		1･2･3	Fall	Every	E		
ESd6612	(F) QA30024	Structural Information System	KAWAMURA YASUMI	2	Lectures		1･2･3	Fall	Every	E		
ESd6612	(F) QA30034	Advanced Ship and Marine Structural Design Methodologies	OKADA TETSUO	2	Lectures		1･2･3	Fall	Every	E		
ESd6611	(S) QA30041	Advanced Spacecraft Attitude Control	UENO SEIYA	2	Lectures		1･2･3	Spring	Every	E		
ESd6612	(F) QA30054	Advanced Seakeeping Qualities	HIRAKAWA YOSHIAKI	2	Lectures		1･2･3	Fall	Every	E		
ESd6611	(S) QA30061	Advanced Aircraft Aerodynamic Design	MIYAJI KOJI	2	Lectures		1･2･3	Spring	Every	E		
ESd6612	(S) QA30071	Advanced Ocean Resources and Energy Engineering	NISHI YOSHIKI	2	Lectures		1･2･3	Spring	Every	E		
ESd6612	(F) QA30084	Advanced Theory in Dynamics of Floating Bodies Engineering	MURAI MOTOHIKO	2	Lectures		1･2･3	Fall	Every	E		
ESd6611	(F) QA30094	Advanced Aerospace Utilization Engineering	HIGUCHI TAKEHIRO	2	Lectures		1･2･3	Fall	Every	E		
ESd6612	(F) QA30104	Advanced Engineering Turbulence	YOUHEI TAKAGI , et.al.	2	Lectures		1･2･3	Fall	Every	E		
ESd6612	(F) QA30114	Advanced Maritime Traffic Safety	FUKUTO JUNJI , et.al.	2	Lectures		1･2･3	Fall	Every	E		
ESd6612	(S) QA30121	Advanced Engineering for Ocean Development	KATOH SYUNJI	2	Lectures		1･2･3	Spring	Every	E		
ESd6612	(S) QA30131	Advanced Systems Engineering Theory of Ship Design	MITSUYUKI TAIGA , et.al.	2	Lectures		1･2･3	Spring	Every	E		
ESd6031	(S) QA31101 (F) QA31104	Advanced Exercises in Ocean and Space System Engineering	Each Instructor , et.al.	3	Seminars	○	1･2･3	Spring･Fall	Every	J		
ESd6032	(S) QA31201 (F) QA31204	Advanced Study in Ocean and Space System Engineering	Each Instructor , et.al.	2	Seminars		1･2･3	Spring･Fall	Every	J		
ESd6035	(S) QA31301 (F) QA31304	Teaching Practice in Ocean and Space System Engineering	Each Instructor , et.al.	1	Exercise		1･2･3	Spring･Fall	Every	J		
ESd6034	(S) QA31401 (F) QA31404	Off-Campus Exercise in Ocean and Space System Engineering	Each Instructor , et.al.	1	Exercise		1･2･3	Spring･Fall	Every	J		
ESd6034	(S) QA39811 (F) QA39814	International Internship in Ocean and Space System Engineering	Each Instructor	1	Exercise		1･2･3	Spring･Fall	Every	E		

Chemistry and Life Science

Numbering	Schedule code	Course name	Instructor	Credits	Style of class	Academic tutorials	Grade	Term	Year	Language of instruction	Night/ Weekend	Remarks
ESh6522	(S) QB10011	Organometallic chemistry	MINATO MAKOTO	2	Lectures		1･2･3	Spring	Even	E		
ESh6603	(S) QB10021	Catalysis engineering	INAGAKI SATOSHI	2	Lectures		1･2･3	Spring	Even	E		
ESh6603	(F) QB10034	Catalyst Design	KUBOTA YOSHIHIRO	2	Lectures		1･2･3	Fall	Odd	E		
ESh6531	(S) QB10041	Photoresponsive Materials	UBUKATA TAKASHI	2	Lectures		1･2･3	Spring	Even	E		
ESh6544	(F) QB10054	Electrochemical Devices	DOKKO KAORU	2	Lectures		1･2･3	Fall	Odd	E		
ESh6533	(S) QB10061	Chemistry of Functional Polymers	OYAMA TOSHIYUKI	2	Lectures		1･2･3	Spring	Odd	E		
ESh6521	(S) QB10071	Solution Theories	SAKOMURA MASARU	2	Lectures		1･2･3	Spring	Even	E		
ESh6532	(F) QB10084	Advanced Course on Organic Electron-transfer Chemistry	ATOBE MAHITO	2	Lectures		1･2･3	Fall	Even	E		
ESh6592	(F) QB10095	Ceramic Materials Design	TATAMI JUNICHI	1	Lectures		1･2･3		Every	E		
ESh6601	(F) QB10105	Advanced Powder Processing and Materials Engineering	IIJIMA MOTOYUKI	1	Lectures		1･2･3		Every	E		
ESh6521	(F) QB10114	Photochemistry and Spectroscopy	SEKI KANEKAZU	2	Lectures		1･2･3	Fall	Odd	E		
ESh6521	(S) QB10121	Quantum theory for large systems	SATO KOTA	2	Lectures		1･2･3	Spring	Even	E		
ESh6507	(F) QB10134	Astrobiology Special Lecture	KEBUKAWA YOKO	2	Lectures		1･2･3	Fall	Even	E		
ESh6672	(F) QB10144	Functional Structural Biology	CHOJIRO KOJIMA	2	Lectures		1･2･3	Fall	Odd	E		
ESh6523	(S) QB10151	Applied Coordination Chemistry	YOSHITAKA YAMAGUCHI	2	Lectures		1･2･3	Spring	Odd	E		
ESh6521	(S) QB10161	Advanced Photophysics and Photochemistry	KIKUCHI AZUSA	2	Lectures		1･2･3	Spring	Even	E		
ESh6496	(F) QB10174	Advanced Structural Life Science	KAWAMURA IZURU	2	Lectures		1･2･3	Fall	Even	E		
ESh6522	(S) QB10181	Molecular design for functional materials	GOTO HIROAKI	2	Lectures		1･2･3	Spring	Odd	E		
Esh6532	(S) QB10191	Advanced Synthetic Organic Chemistry	ITO SUGURU	2	Lectures		1･2･3	Spring	Odd	E		
ESh6523	(F) QB10204	Advanced Solid State Chemistry	YABUUCHI NAOAKI	2	Lectures		1･2･3	Fall	Odd	E		
ESh6011	(S) QB11101 (F) QB11104	Advanced Exercise in Chemistry (PSD)	Each Instructor of Chemistry	3	Seminars	○	1･2･3	Spring･Fall	Every	J		
ESh6015	(S) QB11201 (F) QB11204	Teaching Practice in Chemistry (PSD)	Each Instructor of Chemistry	1	Exercise		1･2･3	Spring･Fall	Every	J		
ESh6014	(S) QB11301 (F) QB11304	Off-Campus Exercise in Chemistry (PSD)	Each Instructor of Chemistry	1	Exercise		1･2･3	Spring･Fall	Every	J		
ESh6012	(S) QB11401 (F) QB11404	Advanced Study in Chemistry (PSD)	Each Instructor of Chemistry	2	Seminars		1･2･3	Spring･Fall	Every	J		
ESh6021	(S) QB11501 (F) QB11504	Advanced Exercise in Chemistry (TED)	Each Instructor of Applied Chemistry	3	Seminars	○	1･2･3	Spring･Fall	Every	J		
ESh6025	(S) QB11601 (F) QB11604	Teaching Practice in Chemistry (TED)	Each Instructor of Applied Chemistry	1	Exercise		1･2･3	Spring･Fall	Every	J		
ESh6024	(S) QB11701 (F) QB11704	Off-Campus Exercise in Chemistry (TED)	Each Instructor of Applied Chemistry	1	Exercise		1･2･3	Spring･Fall	Every	J		
ESh6022	(S) QB11801 (F) QB11804	Advanced Study in Chemistry (TED)	Each Instructor of Applied Chemistry	2	Seminars		1･2･3	Spring･Fall	Every	J		
ESh6014	(S) QB19811 (F) QB19814	International Internship in Chemistry (PSD)	Each Instructor of Chemistry	1	Exercise		1･2･3	Spring･Fall	Every	E		
ESh6014	(S) QB19821 (F) QB19824	International Internship in Chemistry (TED)	Each Instructor of Applied Chemistry	1	Exercise		1･2･3	Spring･Fall	Every	E		
ESh6594	(F) QB20014	Industrial materials and materials chemistry	OKAZAKI SHINJI	2	Lectures		1･2･3	Fall	Every	E		
ESh6531	(S) QB20021	Electrochemical Materials	MATSUZAWA KOICHI , et.al.	2	Lectures		1･2･3	Spring	Odd	E		
ESh6537	(F) QB20034	Advanced Energy Chemistry	MITSUSHIMA SHIGENORI	2	Lectures		1･2･3	Fall	Even	E		
ESh6551	(F) QB20044	Materials for Energy Machines	TAKAHASHI KOJI	2	Lectures		1･2･3	Fall	Even	E		
ESh6537	(S) QB20051	Energy Value Chain System	MUGIKURA YOSHIHIRO	2	Lectures		1･2･3	Spring	Odd	J		

Numbering	Schedule code	Course name	Instructor	Credits	Style of class	Academic tutorials	Grade	Term	Year	Language of instruction	Night/Weekend	Remarks
ESh6602	(S) QB20061	Energy Conversion Technology	MORITA HIROSHI	2	Lectures		1･2･3	Spring	Odd	J		
ESh6537	(F) QB20074	Material Science for Energy applications	YAMAMOTO TOHRU , et.al.	2	Lectures		1･2･3	Fall	Odd	J		
ESh6555	(S) QB20081	Environmental Energy Engineering	OKUYAMA KUNITO	2	Lectures		1･2･3	Spring	Odd	E		
ESh6602	(S) QB20091	Reactor and Process Design	HABUKA HITOSHI	2	Lectures		1･2･3	Spring	Odd	E		
ESh6616	(S) QB20101	Chemical Energy Engineering	AIHARA MASAHIKO	2	Lectures		1･2･3	Spring	Every	E		
ESh6601	(F) QB20114	Separation Engineering Excerptus	NAKAMURA KAZUHO	2	Lectures		1･2･3	Fall	Odd	E		
ESh6714	(S) QB20121	Biopolymer Engineering	TAKEDA MINORU	2	Lectures		1･2･3	Spring	Even	E		
ESh6231	(F) QB20134	Advanced Medical Engineering	FUKUDA JUNJI	2	Lectures		1･2･3	Fall	Odd	E		
ESh6536	(S) QB20141	Chemical Reactions in the Environment	YOSHITAKE HIDEAKI	2	Lectures		1･2･3	Spring	Odd	E		
ESh6671	(F) QB20154	Biology of Phenome	KURIHARA YASUYUKI	2	Lectures		1･2･3	Fall	Every	E		
ESh6676	(F) QB20164	Advanced Devlopmental Engineering	SUZUKI ATSUSHI	2	Lectures		1･2･3	Fall	Every	E		
ESh6593	(F) QB20174	Advanced Functional Materials Science	KANAI TOSHIMITSU	2	Lectures		1･2･3	Fall	Odd	E		
ESh6604	(S) QB20181	Special Lecture in Tissue Engineering and Regenerative Medicine	FUKUDA JUNJI	2	Lectures		1･2･3	Spring	Odd	E		
ESh6042	(S) QB21101 (F) QB21104	Advanced Seminar in Chemistry Applications and Life Science	Each Instructor , et.al.	3	Seminars	○	1･2･3	Spring･Fall	Every	J		
ESh6045	(S) QB21201 (F) QB21204	Teaching Practice in Chemistry Applications and Life Science	Each Instructor , et.al.	1	Exercise		1･2･3	Spring･Fall	Every	J		
ESh6045	(S) QB21301 (F) QB21304	Off-Campus Exercise in Chemistry Applications and Life Science	Each Instructor , et.al.	1	Exercise		1･2･3	Spring･Fall	Every	J		
ESh6042	(S) QB21401 (F) QB21404	Advanced Study in Chemistry Applications and Life Science	Each Instructor , et.al.	2	Seminars		1･2･3	Spring･Fall	Every	J		
ESh6044	(S) QB29811 (F) QB29814	TED International Internship in Chemistry Applications and Life Science	Each Instructor , et.al.	1	Exercise		1･2･3	Spring･Fall	Every	J		
ESh6048	(S) QB29821 (F) QB29824	PED International Internship in Chemistry Applications and Life Science	Each Instructor	1	Exercise		1･2･3	Spring･Fall	Every	J		

Mathematics, Physics, Electrical Engineering and Computer Science

Numbering	Schedule code	Course name	Instructor	Credits	Style of class	Academic tutorials	Grade	Term	Year	Language of instruction	Night/ Weekend	Remarks
ESI6013	(S) QC11101	Advanced Seminar in Mathematical Sciences A	KAJIWARA TAKESHI , et.al.	2	Seminars		1･2･3	Spring	Every	J		
ESI6013	(F) QC11204	Advanced Seminar in Mathematical Sciences B	KAJIWARA TAKESHI , et.al.	2	Seminars		1･2･3	Fall	Every	J		
ESI6013	(S) QC11301	Advanced Seminar in Mathematical Sciences C	KAJIWARA TAKESHI , et.al.	2	Seminars		1･2･3	Spring	Every	J		
ESI6013	(F) QC11404	Advanced Seminar in Mathematical Sciences D	KAJIWARA TAKESHI , et.al.	2	Seminars		1･2･3	Fall	Every	J		
ESI6011	(S) QC11501 (F) QC11504	Advanced Exercises in Mathematical Sciences	KAJIWARA TAKESHI , et.al.	3	Seminars	○	1･2･3	Spring･Fall	Every	J		
ESI6014	(S) QC11601 (F) QC11604	Advanced Training in Mathematical Sciences	KAJIWARA TAKESHI , et.al.	1	Exercise		1･2･3	Spring･Fall	Every	J		
ESI6432	(F) QC20014	Nanoscale Materials Design	OONO KAORU	2	Lectures		1･2	Fall	Every	E		
ESI6494	(F) QC20024	Computer Simulation in Quantum System	KURAMOTO TETSUJI	2	Lectures		1･2	Fall	Every	E		
ESI6494	(F) QC20034	Condensed Matter Theory of Nano and Microscopic Systems	SHIRASAKI RYOEN	2	Lectures		1･2	Fall	Every	E		
ESI6492	(S) QC20041	Advanced low temperature physics	SHIMAZU YOSHIHIRO	2	Lectures		1･2	Spring	Every	E		
ESI6493	(F) QC20054	Advanced Magneto-Science	YAMAMOTO ISAO	2	Lectures		1･2	Fall	Every	E		
ESI6441	(F) QC20064	Advanced Magnetics	ICHIYANAGI YUKO	2	Lectures		1･2	Fall	Every	E		
ESI6493	(S) QC20071	Condensed Matter Physics under Multiple Extreme Conditions	UMEHARA IZURU	2	Lectures		1･2	Spring	Every	E		
ESI6493	(F) QC20084	Advanced Physics of Novel Materials	UEHARA MASATOMO , et.al.	2	Lectures		1･2	Fall	Every	E		
ESI6432	(F) QC20094	Advanced Quantum Information Physics	KOSAKA HIDEO	2	Lectures		1･2	Fall	Every	E		
ESI6492	(S) QC20101	Advanced Ultrafast Optics	TAKEDA JUN	2	Lectures		1･2	Spring	Every	E		
ESI6495	(F) QC20114	Precision Laser Spectroscopy	KOH HOURAI	2	Lectures		1･2	Fall	Every	E		
ESI6492	(S) QC20121	Advanced Terahertz Science	KATAYAMA IKUFUMI	2	Lectures		1･2	Spring	Every	E		
ESI6492	(S) QC20131	Advanced Semiconductor Physics	SEKIYA TAKAO	2	Lectures		1･2	Spring	Every	E		
ESI6492	(S) QC20141	Topics in Material Science at the Nanoscale	SHUDO KENICHI	2	Lectures		1･2	Spring	Every	E		
ESI6443	(S) QC20151	Advanced Experimental Methods in Surface Science	OHNO SHINYA	2	Lectures		1･2	Spring	Every	E		
ESI6491	(F) QC20164	Advanced High Energy Cosmic Ray Astrophysics	KATAYOSE YUSAKU	2	Lectures		1･2	Fall	Every	E		
ESI6491	(F) QC20174	Advanced Astroparticle Physics	NAKAMURA SHOGO	2	Lectures		1･2	Fall	Every	E		
ESI6491	(S) QC20181	Advanced Neutrino Physics	MINAMINO AKIHIRO	2	Lectures		1･2	Spring	Every	E		
ESI6494	(F) QC20194	Nonlinear Waves	ISHIWATA SHINGO	2	Lectures		1･2	Fall	Every	E		
ESI6511	(S) QC20201	Plasma Experimental Physics	TSUSHIMA AKIRA	2	Lectures		1･2	Spring	Every	E		
ESI6021	(S) QC21101 (F) QC21104	Advanced Exercise in Physics	Each Instructor of Physics	3	Seminars	○	1･2･3	Spring･Fall	Every	J		
ESI6023	(S) QC21201	Advanced Seminor in Physics, A	Each Instructor of Physics	2	Seminars		1	Spring	Every	J		
ESI6023	(F) QC21304	Advanced Seminor in Physics, B	Each Instructor of Physics	2	Seminars		1	Fall	Every	J		
ESI6025	(S) QC21401 (F) QC21404	Teaching Practice in Physics	Each Instructor of Physics	1	Exercise		1･2･3	Spring･Fall	Every	J		
ESI6024	(S) QC21501 (F) QC21504	Off-Campus Exercise in Physics	Each Instructor of Physics	1	Exercise		1･2･3	Spring･Fall	Every	J		
ESI6022	(S) QC21601 (F) QC21604	Advanced Study in Physics	Each Instructor of Physics , et.al.	2	Seminars		1･2･3	Spring･Fall	Every	J		
ESI6232	(S) QC30011	Advanced Medical Engineering and Informatics	HAMAGAMI TOMOKI	2	Lectures		1･2･3	Spring	Every	E		
ESI6564	(F) QC30024	Advanced Antennas and Propagation Engineering II	ARAI HIROYUKI	2	Lectures		1･2･3	Fall	Even	E		
ESI6112	(S) QC30031	Special Issues On Open Source Study	KURAMITSU KIMIO	2	Lectures		1･2･3	Spring	Even	E		

Numbering	Schedule code	Course name	Instructor	Credits	Style of class	Academic tutorials	Grade	Term	Year	Language of instruction	Night/Weekend	Remarks
ESI6566	(S) QC30041	Advanced Theory of Systems, Control and Information	FUJIMOTO YASUTAKA	2	Lectures		1･2･3	Spring	Odd	E		
ESI6565	(F) QC30054	Advanced Digital Circuit Theory	ICHIGE KOICHI	2	Lectures		1･2･3	Fall	Even	E		
ESI6563	(F) QC30064	Advanced Data Storage	TAKEMURA YASUSHI	2	Lectures		1･2･3	Fall	Every	E		
ESI6564	(S) QC30071	Advanced Microwave Engineering	KUGA NOBUHIRO	2	Lectures		1･2･3	Spring	Odd	E		
ESI6564	(F) QC30084	Advanced Multimedia Mobile Communication Networks	HIROYUKI TSUJI	2	Lectures		1･2･3	Fall	Even	J		
ESI6561	(F) QC30094	Advanced Mechatronics	SHIMONO TOMOYUKI	2	Lectures		1･2･3	Fall	Odd	E		
ESI6444	(F) QC30104	Advanced Quantum Optoelectronics	BABA TOSHIHIKO	2	Lectures		1･2･3	Fall	Every	E		
ESI6436	(F) QC30114	Advanced Integrated Nanodevices	OYA TAKAHIDE	2	Lectures		1･2･3	Fall	Odd	E		
ESI6564	(S) QC30121	Advanced Topics of Information Theory	KOHNO RYUJI	2	Lectures		1･2･3	Spring	Every	E		
ESI6124	(S) QC30131	Advanced Intelligent Systems	HAMAGAMI TOMOKI	2	Lectures		1･2･3	Spring	Even	E		
ESI6563	(S) QC30141	Advanced Superconductivity Electronics	YOSHIKAWA NOBUYUKI	2	Lectures		1･2･3	Spring	Every	J		
ESI6561	(S) QC30151	Advanced Power System Engineering	OYAMA TSUTOMU	2	Lectures		1･2･3	Spring	Even	E		
ESI6561	(F) QC30164	Advanced Technology in Power System Protection and Control	TSUJI TAKAO	2	Lectures		1･2･3	Fall	Every	E		
ESI6563	(F) QC30174	Advanced Semiconductor Devices	HANEJI NOBUO	2	Lectures		1･2･3	Fall	Even	J		
ESI6564	(S) QC30181	Advanced Coding Theory	OCHIAI HIDEKI	2	Lectures		1･2･3	Spring	Odd	E		
ESI6444	(F) QC30194	Seminar in Quantum Effect Devices	ARAKAWA TARO	2	Lectures		1･2･3	Fall	Every	E		
ESI6563	(S) QC30201	Advanced Integrated Quantum Devices	YAMANASHI YUKI	2	Lectures		1･2･3	Spring	Odd	E		
ESI6234	(F) QC30214	Advanced Biomedical System Engineering	SHIMA KEISUKE	2	Lectures		1･2･3	Fall	Odd	E		
ESI6432	(S) QC30221	Advanced in Nanophotonics	NISHIJIMA YOSHIAKI , et.al.	2	Lectures		1･2･3	Spring	Every	E		
ESI6033	(S) QC30231	Colloquium in Applied Physics III-1S	Each Instructor of Applied Physics , et.al.	1	Lectures		1	Spring	Every	J		
ESI6033	(S) QC30241	Colloquium in Applied Physics III-2S	Each Instructor of Applied Physics , et.al.	1	Lectures		2	Spring	Every	J		
ESI6033	(S) QC30251	Colloquium in Applied Physics III-3S	Each Instructor of Applied Physics , et.al.	1	Lectures		3	Spring	Every	J		
ESI6033	(F) QC30264	Colloquium in Applied Physics III-1F	Each Instructor of Applied Physics , et.al.	1	Lectures		1	Fall	Every	J		
ESI6033	(F) QC30274	Colloquium in Applied Physics III-2F	Each Instructor of Applied Physics , et.al.	1	Lectures		2	Fall	Every	J		
ESI6033	(F) QC30284	Colloquium in Applied Physics III-3F	Each Instructor of Applied Physics , et.al.	1	Lectures		3	Fall	Every	J		
ESI6043	(S) QC30291	Colloquium in Information Systems III-1S	Each Instructor , et.al.	1	Lectures		1	Spring	Every	J		
ESI6043	(S) QC30301	Colloquium in Information Systems III-2S	Each Instructor , et.al.	1	Lectures		2	Spring	Every	J		
ESI6043	(S) QC30311	Colloquium in Information Systems III-3S	Each Instructor , et.al.	1	Lectures		3	Spring	Every	J		
ESI6043	(F) QC30324	Colloquium in Information Systems III-1F	Each Instructor , et.al.	1	Lectures		1	Fall	Every	J		
ESI6043	(F) QC30334	Colloquium in Information Systems III-2F	Each Instructor , et.al.	1	Lectures		2	Fall	Every	J		
ESI6043	(F) QC30344	Colloquium in Information Systems III-3F	Each Instructor , et.al.	1	Lectures		3	Fall	Every	J		
ESI6053	(S) QC30351	Colloquium in Electrical and Computer Engineering III-1S	Each Instructor , et.al.	1	Lectures		1	Spring	Every	J		
ESI6053	(S) QC30361	Colloquium in Electrical and Computer Engineering III-2S	Each Instructor , et.al.	1	Lectures		2	Spring	Every	J		
ESI6053	(S) QC30371	Colloquium in Electrical and Computer Engineering III-3S	Each Instructor , et.al.	1	Lectures		3	Spring	Every	J		
ESI6053	(F) QC30384	Colloquium in Electrical and Computer Engineering III-1F	Each Instructor , et.al.	1	Lectures		1	Fall	Every	J		
ESI6053	(F) QC30394	Colloquium in Electrical and Computer Engineering III-2F	Each Instructor , et.al.	1	Lectures		2	Fall	Every	J		

Numbering	Schedule code	Course name	Instructor	Credits	Style of class	Academic tutorials	Grade	Term	Year	Language of instruction	Night/Weekend	Remarks
ESI6053	(F) QC30404	Colloquium in Electrical and Computer Engineering III-3F	Each Instructor , et.al.	1	Lectures		3	Fall	Every	J		
ESI6033	(F) QC31104	Exercise in Applied Physics	Each Instructor of Applied Physics , et.al.	1	Exercise		1・2・3	Fall	Every	J		
ESI6035	(F) QC31204	Teaching Practice in Applied Physics	Each Instructor of Applied Physics , et.al.	1	Exercise		1・2・3	Fall	Every	J		
ESI6034	(F) QC31304	Off-Campus Exercise in Applied Physics	Each Instructor of Applied Physics , et.al.	1	Exercise		1・2・3	Fall	Every	J		
ESI6032	(F) QC31404	Advanced Study in Applied Physics	Each Instructor of Applied Physics	2	Seminars		1・2・3	Fall	Every	J		
ESI6032	(S) QC31501 (F) QC31504	Advanced Excercise in Applied Physics III-1	Each Instructor of Applied Physics , et.al.	3	Seminars	○	1・2・3	Spring・Fall	Every	J		
ESI6043	(F) QC31604	Exercise in Information Systems	Each Instructor , et.al.	1	Exercise		1・2・3	Fall	Every	J		
ESI6045	(F) QC31704	Teaching Practice in Information Systems	Each Instructor , et.al.	1	Exercise		1・2・3	Fall	Every	J		
ESI6044	(F) QC31804	Off-Campus Exercise in Information Systems	Each Instructor , et.al.	1	Exercise		1・2・3	Fall	Every	J		
ESI6042	(F) QC31904	Advanced Study in Information Systems	Each Instructor	2	Seminars		1・2・3	Fall	Every	J		
ESI6042	(S) QC32001 (F) QC32004	Advanced Excercise in Information Systems III-1	Each Instructor , et.al.	3	Seminars	○	1・2・3	Spring・Fall	Every	J		
ESI6052	(F) QC32104	Exercise in Electrical and Computer Engineering	Each Instructor , et.al.	1	Exercise		1・2・3	Fall	Every	J		
ESI6055	(F) QC32204	Teaching Practice in Electrical and Computer Engineering	Each Instructor , et.al.	1	Exercise		1・2・3	Fall	Every	J		
ESI6054	(F) QC32304	Off-Campus Exercise in Electrical and Computer Engineering	Each Instructor , et.al.	1	Exercise		1・2・3	Fall	Every	J		
ESI6052	(F) QC32404	Advanced Study in Electrical and Computer Engineering	Each Instructor	2	Seminars		1・2・3	Fall	Every	J		
ESI6052	(S) QC32501 (F) QC32504	Advanced Excercise in Electrical and Computer Engineering III-1	Each Instructor , et.al.	3	Seminars	○	1・2・3	Spring・Fall	Every	J		
ESI6034	(S) QC39811 (F) QC39814	TED International Internships in Applied Physics	Each Instructor of Applied Physics , et.al.	1	Exercise		1・2・3	Spring・Fall	Every	E		
ESI6044	(S) QC39821 (F) QC39824	TED International Internships in Information Systems	Each Instructor , et.al.	1	Exercise		1・2・3	Spring・Fall	Every	E		
ESI6054	(S) QC39831 (F) QC39834	International Internships in Electrical and Computer Engineering	Each Instructor	1	Exercise		1・2・3	Spring・Fall	Every	E		

VI-3 Master's program

<Pi-type Engineering Degree (PED) Program>

【core courses】

Classification	Numbering	Schedule code	Course name	Instructor	Credits	Style of class	Academic tutorials	Grade	Semester	Year	Language of instruction	Remarks
p	ESa5002	(S) N000011	Multi-diciplinary Problem Based Learning in Graduate School of Engineering Science	TAKADA HAJIME , et.al.	2	Lectures		1・2	Spring	Every	J	
p	ESa5006	(A) N00002A (B) N00002B (C) N00002C (D) N00002D (E) N00002E (F) N00002F	Presentation English	ANDO YOSHITAKA	2	Lectures		1・2	Spring・Fall	Every	E	Required course of PED Program (A-D : Spring semester, E-F : Fall Semester)
p	ESa4006	(A) N00003A (B) N00003B (C) N00003C (D) N00003D	Presentation English S, Basic Level	INADA MASATOSHI , et.al.	2	Lectures		1・2	Spring	Every	E	In charge of (A),(B) class: INADA MASATOSHI In charge of (C),(D) class: KAYABUKI TADASHI
p	ESa4006	(A) N00003A (B) N00003B	Presentation English F, Basic Level	INADA MASATOSHI , et.al.	2	Lectures		1・2	Fall	Every	E	In charge of (A) class: INADA MASATOSHI In charge of (C) class: KAYABUKI TADASHI
p	ESa4181	(S) N000051	Engineering Ethics for Risk Management	TAKADA HAJIME , et.al.	2	Lectures		1	Spring	Every	J	This course is the Lecture among the course group that makes up the modure (1)-(6) in the Department of Mechanical Engineering, Materials Science and Ocean Engineering. Also in the Department of Mathematical, Physics,Electrical Engineering and Computer Science.
p	ESa4004	(F) N000064	Innovation and New Business Ⅱ	HANEJI NOBUO , et.al.	2	Lectures		1・2	Fall	Every	J	
p	ESa4002	(S) N000071	Project Management Ⅰ	MASAKI KADONO	2	Lectures		1・2	Spring	Every	E	
p	ESa4002	(S) N000081	Project Management Ⅱ	MASAKI KADONO	2	Lectures		1・2	Spring	Every	E	
p	ESa4002	(S) N000091	Professional Engineering Ⅰ	MAKI IWAKUMA , et.al.	2	Lectures		1・2	Spring	Every	J	
p	ESa4002	(F) N000104	Professional Engineering Ⅱ	MAKI IWAKUMA , et.al.	2	Lectures		1・2	Fall	Every	J	
p	ESa4002	(S) N000111	The Professional Ethics in EU&US	KITAGAWA TATSUO , et.al.	2	Lectures		1・2	Spring	Every	E	
p	ESa4002	(S) N000121	Effective Business Planning in Global Companies	CHOTOKU YUJI	2	Lectures		1・2	Spring	Every	J	
p	ESa4002	(S) N000131	Next Generation's Business Skills as a Global Standard	YAMAGUCHI HIROSHI	2	Lectures		1・2	Spring	Every	J	
p	ESa4002	(S) N000141	Innovation and Challenges Ⅰ	HANEJI NOBUO , et.al.	2	Lectures		1・2	Spring	Every	J	
p	ESa4002	(S) N000151	Innovation and Challenges Ⅱ	HANEJI NOBUO , et.al.	2	Lectures		1・2	Spring	Every	J	
p	ESa4002	(S) N000161	Standardization and Business	MANABU ETO , et.al.	2	Lectures		1・2	Spring	Every	J	
p	ESa4002	(S) N000171	Technological subject in Kanagawa prefecture	TAMECHIKA EMI	2	Lectures		1・2	Spring	Every	J	
p	ESa9004	(S) N009811 (F) N009814	Oversea Internship for Science Engineering	UMEHARA IZURU	2	Exercise		1・2	Spring・Fall	Every	J	
i	ESb4554	(S) NA10011	Computational Fluid Engineering	MATSUI JUN	2	Lectures		1	Spring	Every	E	
e	ESb4554	(F) NA10024	Turbulence Phenomena	NISHINO KOICHI	2	Lectures		1・2	Fall	Every	E	This course is the Lecture among the course group that makes up the modure (1)-(6) in the Department of Mechanical Engineering,
s	ESb4444	(F) NA20014	Introduction to Materials for Electronics and Optoelectronics	MUKAI KOKI	2	Lectures		1・2	Fall	Every	E	This course is the Lecture among the course group that makes up the modure (1)-(6) in the Department of Mechanical Engineering,
e	ESb4594	(F) NA20024	Introduction of multi-functional composites	NAKAO WATARU	2	Lectures		1・2	Fall	Every	E	
e	ESb4612	(F) NA30014	Ship Motions in Waves	HIRAKAWA YOSHIAKI	2	Lectures		1・2	Fall	Every	E	
e	ESb4612	(F) NA30024	Introduction to Ocean Resources and Energy Engineering	NISHI YOSHIKI	2	Lectures		1・2	Fall	Every	E	

Classification	Numbering	Schedule code	Course name	Instructor	Credits	Style of class	Academic tutorials	Grade	Semester	Year	Language of instruction	Remarks
i	ESf4521	(F) NB10014	Advanced Statistical Mechanics	SAKOMURA MASARU	2	Lectures		1･2	Fall	Odd	E	
i	ESf4521	(S) NB10021	Quantum theory for chemical reactions	SATO KOTA	2	Lectures		1･2	Spring	Even	E	
e	ESf4603	(S) NB10031	Catalytic Chemistry	KUBOTA YOSHIHIRO	2	Lectures		1･2	Spring	Even	E	
e	ESf4533	(F) NB10044	Design of Polymers and Polymer Systems	OYAMA TOSHIYUKI	2	Lectures		1･2	Fall	Even	E	
s	ESf4522	(F) NB10054	Organic Photochemistry	MURATA SHIGERU	2	Lectures		1･2	Fall	Even	J	
s	ESf4712	(F) NB10064	Microbial Biotechnology	kikuchi yoshimi	2	Lectures		1･2	Fall	Odd	J	
s	ESf4534	(F) NB10074	Advanced Instrumental Analysis	MAKOTO TANIMURA	2	Lectures		1･2	Fall	Every	J	
s	ESh4523	(F) NB10254	Solid State Chemistry	YABUUCHI NAOAKI	2	Lectures		1･2	Fall	Even	E	
i	ESf5565	(S) NB20011	Process Monitoring	OKAZAKI SHINJI	2	Lectures		1･2	Spring	Every	E	
e	ESf5555	(F) NB20024	Advanced Heat Transfer	OKUYAMA KUNITO , et.al.	2	Lectures		1･2	Fall	Every	E	
e	ESf5601	(S) NB20031	Advanced Transport Phenomena	AIHARA MASAHIKO	2	Lectures		1･2	Spring	Every	E	
e	ESf5537	(S) NB20043	Cutting Edge of Fuel Cell Technology	MITSUSHIMA SHIGENORI , et.al.	2	Lectures		1･2		Every	E	
s	ESj4471	(F) NC10014	Mathematical Sciences: Algebra	KAJIWARA TAKESHI	2	Lectures		1･2	Fall	Even	E	
s	ESj4472	(S) NC10021	Mathematical Sciences: Geometry	HONDA ATSUFUMI	2	Lectures		1･2	Spring	Odd	E	
s	ESj4473	(S) NC10031	Mathematical Sciences: Analysis	SHIOJI NAOKI	2	Lectures		1･2	Spring	Even	E	
i	ESj4475	(F) NC10044	Mathematical Sciences: Probability and Statistics	KONNO NORIO , et.al.	2	Lectures		1･2	Fall	Every	E	
s	ESj4475	(S) NC10051	Mathematical Sciences: Data Sciences	KUROKI MANABU	2	Lectures		1･2	Spring	Every	E	
i	ESj4494	(S) NC20011	Quantum Statistical Mechanics	KURAMOTO TETSUJI	2	Lectures		1･2	Spring	Even	E	
s	ESj4432	(S) NC20021	Nanophysics and Advanced Materials	ICHIYANAGI YUKO , et.al.	2	Lectures		1･2	Spring	Every	E	
s	ESj4493	(S) NC20031	Magneto-Science	UEHARA MASATOMO , et.al.	2	Lectures		1･2	Spring	Every	E	
s	ESj4492	(F) NC20044	Low temperature physics	SHIMAZU YOSHIHIRO	2	Lectures		1･2	Fall	Odd	E	
s	ESj4491	(S) NC20051	Astroparticle Physics	NAKAMURA SHOGO	2	Lectures		1･2	Spring	Odd	E	
s	ESj4511	(F) NC20064	Plasma Physics	TSUSHIMA AKIRA	2	Lectures		1･2	Fall	Even	E	
e	ESj4616	(F) NC30014	Energy System	FUJII YASUMASA , et.al.	2	Lectures		1･2	Fall	Even	J	
i	ESj4564	(F) NC30024	Signal Theory	SHOUKI HIROKI	2	Lectures		1･2	Fall	Every	J	
i	ESj4564	(F) NC30034	Advanced Digital Communications	KOHNO RYUJI	2	Lectures		1･2	Fall	Every	E	
e	ESj4563	(S) NC30041	VLSI System Design	YOSHIKAWA NOBUYUKI	2	Lectures		1･2	Spring	Every	E	
e	ESj4563	(F) NC30054	A Course for Advanced Electronics Products and Their Architecture	YOSHIKAWA NOBUYUKI	2	Lectures		1･2	Fall	Every	J	
i	ESj4124	(F) NC30064	Intelligent Systems	HAMAGAMI TOMOKI	2	Lectures		1･2	Fall	Every	E	
e	ESj4562	(S) NC30071	Material Integration	MATSUKI TAKEO	2	Lectures		1･2	Spring	Every	J	

【specialized module】

Mechanical Engineering, Materials Science, and Ocean Engineering

Studio courses

Module Title	Schedule code	Studio courses name	Instructor	Credits	Style of class	Grade	Term	Remarks
Design of Processing Systems	(S) NA15101 (F) NA15104	Design of Processing Systems A	AKINIWA YOSHIAKI , et.al.	4	Exercise	1・2	Spring・Fall	
	(S) NA15201 (F) NA15204	Design of Processing Systems B	AKINIWA YOSHIAKI , et.al.	4	Exercise	1・2	Spring・Fall	
Manufacturing of Processing Systems	(S) NA15301 (F) NA15304	Manufacturing of Processing Systems A	AKINIWA YOSHIAKI , et.al.	4	Exercise	1・2	Spring・Fall	
	(S) NA15401 (F) NA15404	Manufacturing of Processing Systems B	AKINIWA YOSHIAKI , et.al.	4	Exercise	1・2	Spring・Fall	
Design of Thermal and Fluid Systems	(S) NA15501 (F) NA15504	Design of Thermal and Fluid Systems A	MATSUMOTO HIROAKI , et.al.	4	Exercise	1・2	Spring・Fall	
	(S) NA15601 (F) NA15604	Design of Thermal and Fluid Systems B	MATSUMOTO HIROAKI , et.al.	4	Exercise	1・2	Spring・Fall	
Manufacturing of Thermal and Fluid Systems	(S) NA15701 (F) NA15704	Manufacturing of Thermal and Fluid Systems A	MATSUMOTO HIROAKI , et.al.	4	Exercise	1・2	Spring・Fall	
	(S) NA15801 (F) NA15804	Manufacturing of Thermal and Fluid Systems B	MATSUMOTO HIROAKI , et.al.	4	Exercise	1・2	Spring・Fall	
Design of Integrated Systems	(S) NA15901 (F) NA15904	Design of Integrated Systems A	TAKADA HAJIME , et.al.	4	Exercise	1・2	Spring・Fall	
	(S) NA16001 (F) NA16004	Design of Integrated Systems B	TAKADA HAJIME , et.al.	4	Exercise	1・2	Spring・Fall	
Manufacturing of Integrated Systems	(S) NA16101 (F) NA16104	Manufacturing of Integrated Systems A	TAKADA HAJIME , et.al.	4	Exercise	1・2	Spring・Fall	
	(S) NA16201 (F) NA16204	Manufacturing of Integrated Systems B	TAKADA HAJIME , et.al.	4	Exercise	1・2	Spring・Fall	

Related Lecture courses that make up the module

Schedule code	Course name	Instructor	Credits	Style of class	Grade	Term	Remarks
(S) N000051	Engineering Ethics for Risk Management	TAKADA HAJIME , et.al.	2	Lectures	1	Spring	
(F) NA10024	Turbulence Phenomena	NISHINO KOICHI	2	Lectures	1・2	Fall	
(S) NA10031	Advanced Strength Design	YU QIANG	2	Lectures	1・2	Spring	
(F) NA10044	Machine Dynamics	TAKADA HAJIME	2	Lectures	1	Fall	
(F) NA10054	System modeling and control	SANADA KAZUSHI	2	Lectures	1	Fall	
(F) NA10064	Reactive Gas Dynamics	ISHI KAZUHIRO	2	Lectures	1・2	Fall	
(F) NA10084	Mechatronics Design	SATO YASUKAZU	2	Lectures	1・2	Fall	
(S) NA10091	Advanced High-speed Machining	SHINOZUKA JUN	2	Lectures	1	Spring	
(F) NA10104	Fracture Mechanics	AKINIWA YOSHIAKI	2	Lectures	1	Fall	
(S) NA10111	Rarefied Gas Dynamics	MATSUMOTO HIROAKI	2	Lectures	1	Spring	
(S) NA10121	Advanced Robotics	SUGIUCHI HAJIME	2	Lectures	1	Spring	
(S) NA10131	Intelligent Robotic Agents	MAEDA YUUSUKE	2	Lectures	1	Spring	
(F) NA10144	Continuum Mechanics	OZAKI SHINGO	2	Lectures	1・2	Fall	
(F) NA10154	Applied fluid dynamics	HYAKUTAKE TORU	2	Lectures	1	Fall	
(F) NA10164	Design and Principle of Various Actuators	FUCHIWAKI OHMI	2	Lectures	1	Fall	
(F) NA10174	Micromachine Engineering	MARUO SHOJI	2	Lectures	1・2	Fall	
(F) NA10184	Combined Heat Transfer	SAKAI SEIGO	2	Lectures	1	Fall	

Schedule code	Course name	Instructor	Credits	Style of class	Grade	Term	Remarks
(F) NA10194	Applied Thermofluid Engineering	ARAKI TAKUTO	2	Lectures	1	Fall	
(F) NA10204	Cyber-Robotics	KATO RYU	2	Lectures	1・2	Fall	
(F) NA10214	Sensor Engineering	HIROKI OHTA	2	Lectures	1	Fall	
(S) NA10221	FALSE	KITAMURA KEIICHI	2	Lectures	1・2	Spring	
(S) NA10231	Design of Energy Machine Systems	KABATA YASUO , et.al.	2	Lectures	1・2	Spring	
(F) NA20014	Introduction to Materials for Electronics and Optoelectronics	MUKAI KOKI	2	Lectures	1・2	Fall	
(F) NC10014	Mathematical Sciences: Algebra	KAJIWARA TAKESHI	2	Lectures	1・2	Fall	
(S) NA19811 (F) NA19814	Internship in Mechanical Engineering L	Each Instructor (Mechanical Engineering)	4	Exercise	1・2	Spring・Fall	
(S) NA19821 (F) NA19824	Internship in Mechanical Engineering M	Each Instructor (Mechanical Engineering)	2	Exercise	1・2	Spring・Fall	
(S) NA19831 (F) NA19834	Internship in Mechanical Engineering S	Each Instructor (Mechanical Engineering)	1	Exercise	1・2	Spring・Fall	

Studio courses

Module Title	Schedule code	Studio courses name	Instructor	Credits	Style of class	Grade	Term	Remarks
Materials Engineering	(S) NA25101 (F) NA25104	Materials Design Studio	UMEZAWA OSAMU , et.al.	4	Exercise	1・2	Spring・Fall	
	(S) NA25201 (F) NA25204	Materials Fabrication Studio	NAKAO WATARU , et.al.	4	Exercise	1・2	Spring・Fall	
	(S) NA25301 (F) NA25304	Microstructure Control Studio	UMEZAWA OSAMU , et.al.	4	Exercise	1・2	Spring・Fall	
	(S) NA25401 (F) NA25404	Material Characteristics Studio	MUKAI KOKI , et.al.	4	Exercise	1・2	Spring・Fall	
Materials Engineering R&D Practice	(S) NA25501 (F) NA25504	Materials Engineering R&D Studio A	UMEZAWA OSAMU , et.al.	4	Exercise	1・2	Spring・Fall	
	(S) NA25601 (F) NA25604	Materials Engineering R&D Studio B	UMEZAWA OSAMU , et.al.	4	Exercise	1・2	Spring・Fall	

Related Lecture courses that make up the module

Schedule code	Course name	Instructor	Credits	Style of class	Grade	Term	Remarks
(S) NA20051	Diffusional Transformations in Solids	HIROSAWA SHOICHI	2	Lectures	1・2	Spring	
(F) NA20064	Solid State Physics	NAKATSUGAWA HIROSHI	2	Lectures	1・2	Fall	
(F) NA20084	Design and Engineering of High-Temperature Structural Materials	TODA YOSHIAKI	2	Lectures	1・2	Fall	
(F) NA20094	Computational Modeling of Phase Transformation and Microstructure Evolution	SHIMONO MASATO	2	Lectures	1・2	Fall	
(F) NA20104	Microstructure Design in Metallic Materials	MITARAI YOKO	2	Lectures	1・2	Fall	
(S) NA20111	Advanced Strength and Fracture of Materials	HASEGAWA MAKOTO	2	Lectures	1・2	Spring	
(F) NA20124	Introduction to nanomaterials engineering	OHTAKE MITSURU	2	Lectures	1・2	Fall	
(F) NA20134	Advanced structural materials: design and application	FUNAKAWA YOSHIMASA	2	Lectures	1・2	Fall	
(S) NA29811 (F) NA29814	Internship in Materials Engineering L	UMEZAWA OSAMU , et.al.	4	Exercise	1・2	Spring・Fall	
(S) NA29821 (F) NA29824	Internship in Materials Engineering M	UMEZAWA OSAMU , et.al.	2	Exercise	1・2	Spring・Fall	
(S) NA29831 (F) NA29834	Internship in Materials Engineering S	UMEZAWA OSAMU , et.al.	1	Exercise	1・2	Spring・Fall	

Studio courses

Module Title	Schedule code	Studio courses name	Instructor	Credits	Style of class	Grade	Term	Remarks
Ocean Space System	(S) NA35101 (F) NA35104	Studio of Fluid Dynamics for Ocean-Space A	HINO TAKANORI , et.al.	4	Exercise	1・2	Spring・Fall	
	(S) NA35201 (F) NA35204	Studio of Fluid Dynamics for Ocean-Space B	HINO TAKANORI , et.al.	4	Exercise	1・2	Spring・Fall	
	(S) NA35301 (F) NA35304	Studio of Structural Mechanics for Ocean-Space A	OKADA TETSUO , et.al.	4	Exercise	1・2	Spring・Fall	
	(S) NA35401 (F) NA35404	Studio of Structural Mechanics for Ocean-Space B	OKADA TETSUO , et.al.	4	Exercise	1・2	Spring・Fall	
	(S) NA35501 (F) NA35504	Studio for ocean space utilization A	MURAI MOTOHIKO , et.al.	4	Exercise	1・2	Spring・Fall	
	(S) NA35601 (F) NA35604	Studio for ocean space utilization B	MURAI MOTOHIKO , et.al.	4	Exercise	1・2	Spring・Fall	
	(S) NA35701 (F) NA35704	Studio of Maritime Frontier Science A	KAWAMURA YASUMI , et.al.	4	Exercise	1・2	Spring・Fall	
	(S) NA35801 (F) NA35804	Studio of Maritime Frontier Science B	KAWAMURA YASUMI , et.al.	4	Exercise	1・2	Spring・Fall	
Ocean Space R&D Practice	(S) NA35901 (F) NA35904	Studio of R&D in Ocean-Space Engineering A	Each Instructor , et.al.	4	Exercise	1・2	Spring・Fall	Required course of specialization in Systems Design for Ocean-Space
	(S) NA36001 (F) NA36004	Studio of R&D in Ocean-Space Engineering B	Each Instructor , et.al.	4	Exercise	1・2	Spring・Fall	Required course of specialization in Systems Design for Ocean-Space

Related Lecture courses that make up the module

Schedule code	Course name	Instructor	Credits	Style of class	Grade	Term	Remarks
(F) NA30034	Exercises in Computational Hydrodynamics	HINO TAKANORI	2	Lectures	1・2	Fall	
(S) NA30041	Exercises in Computational Structural Analysis	KAWAMURA YASUMI	2	Lectures	1・2	Spring	
(S) NA30051	Introduction to Engineering Turbulence	YOUHEI TAKAGI	2	Lectures	1・2	Spring	
(S) NA30061	Aerospace Utilization Engineering	HIGUCHI TAKEHIRO	2	Lectures	1・2	Spring	
(S) NA30071	Ship and Marine Structural Design Methodologies	OKADA TETSUO	2	Lectures	1・2	Spring	
(F) NA30084	Theory in Dynamics of Floating Bodies Engineering	MURAI MOTOHIKO	2	Lectures	1・2	Fall	
(S) NA30091	Engineering for Ocean Development	KATOH SYUNJI , et.al.	2	Lectures	1・2	Spring	
(S) NA30101	Maritime Traffic Safety	FUKUTO JUNJI , et.al.	2	Lectures	1・2	Spring	
(F) NA30114	Rule Making Procedures through Risk-Based Approaches	YOSHIDA KOICHI , et.al.	2	Lectures	1・2	Fall	
(S) NA30121	Advanced Study of the Ocean Industry	TAKASHINA JYUNSHI	2	Lectures	1・2	Spring	
(S) NA30131 (F) NA30134	Special Lecture on Ocean and Space Engineering A	UENO SEIYA , et.al.	1	Lectures	1・2	Spring・Fall	
(S) NA30141 (F) NA30144	Special Lecture on Ocean and Space Engineering B	UENO SEIYA , et.al.	1	Lectures	1・2	Spring・Fall	
(S) NA30151 (F) NA30154	Special Lecture on Ocean and Space Engineering C	UENO SEIYA , et.al.	1	Lectures	1・2	Spring・Fall	
(S) NA30161 (F) NA30164	Special Lecture on Ocean and Space Engineering D	UENO SEIYA , et.al.	1	Lectures	1・2	Spring・Fall	
(S) NA30171	BJ Collaborative Special lecture on Naval Architecture and Offshore Engineering A	MURAI MOTOHIKO , et.al.	4	Lectures	1・2	Spring	
(S) NA30181	BJ Collaborative Special lecture on Naval Architecture and Offshore Engineering B	MURAI MOTOHIKO , et.al.	2	Lectures	1・2	Spring	
(F) NA30194	BJ Collaborative Special lecture on Naval Architecture and Offshore Engineering C	MURAI MOTOHIKO , et.al.	4	Lectures	1・2	Fall	
(F) NA30204	BJ Collaborative Special lecture on Naval Architecture and Offshore Engineering D	MURAI MOTOHIKO , et.al.	2	Lectures	1・2	Fall	
(F) NA30214	Optimal Astrodynamics	UENO SEIYA	2	Lectures	1・2	Fall	
(F) NA30224	Aircraft Aerodynamic Design	MIYAJI KOJI	2	Lectures	1・2	Fall	
(S) NA30231	Space Environment Utilization Science	NATSUISAKA MAKOTO	2	Lectures	1・2	Spring	

Schedule code	Course name	Instructor	Credits	Style of class	Grade	Term	Remarks
(S) NA30241	Advanced theory of space system	ITO YASUYUKI	2	Lectures	1・2	Spring	
(F) NA30254	Systems Engineering Theory of Ship Design	MITSUYUKI TAIGA	2	Lectures	1・2	Fall	
(S) NA31101 (F) NA31104	Exercise in Ocean and Space Engineering System A	Each Instructor , et.al.	2	Seminars	1	Spring・Fall	
(S) NA31201 (F) NA31204	Exercise in Ocean and Space Engineering System B	Each Instructor , et.al.	2	Seminars	1	Spring・Fall	
(S) NA31501 (F) NA31504	Industrial Training in Ocean and Space System Engineering	Each Instructor , et.al.	2	Seminars	1・2	Spring・Fall	
(S) NA31601 (F) NA31604	Overseas Training in Marine and Space System Engineering	Each Instructor , et.al.	2	Seminars	1・2	Spring・Fall	
(S) NA31701 (F) NA31704	Practical Engineering Training in Ocean-Space	Each Instructor , et.al.	4	Seminars	1・2	Spring・Fall	
(S) NA39811 (F) NA39814	Inntership in Ocean and Space System Engineering L	Each Instructor , et.al.	4	Exercise	1・2	Spring・Fall	
(S) NA39821 (F) NA39824	Inntership in Ocean and Space System Engineering M	Each Instructor , et.al.	2	Exercise	1・2	Spring・Fall	
(S) NA39831 (F) NA39834	Inntership in Ocean and Space System Engineering S	Each Instructor , et.al.	1	Exercise	1・2	Spring・Fall	

Studio courses

Module Title	Schedule code	Studio courses name	Instructor	Credits	Style of class	Grade	Term	Remarks
Aerospace System	(S) NA36101 (F) NA36104	Studio of Aerospace System A	Each Instructor of Aerospace Engineering	4	Exercise	1・2	Spring・Fall	
	(S) NA36201 (F) NA36204	Studio of Aerospace System B	Each Instructor of Aerospace Engineering	4	Exercise	1・2	Spring・Fall	

Related Lecture courses that make up the module

Schedule code	Course name	Instructor	Credits	Style of class	Grade	Term	Remarks
(F) NA10064	Reactive Gas Dynamics	ISHI KAZUHIRO	2	Lectures	1・2	Fall	
(F) NA10074	Space Propulsion Engineering	YOSHINORI TAKAO	2	Lectures	1	Fall	
(S) NA10221	Compressible Flow	KITAMURA KEIICHI	2	Lectures	1・2	Spring	
(S) NA19811 (F) NA19814	Internship in Mechanical Engineering L	Each Instructor (Mechanical Engineering)	4	Exercise	1・2	Spring・Fall	
(S) NA19821 (F) NA19824	Internship in Mechanical Engineering M	Each Instructor (Mechanical Engineering)	2	Exercise	1・2	Spring・Fall	
(S) NA19831 (F) NA19834	Internship in Mechanical Engineering S	Each Instructor (Mechanical Engineering)	1	Exercise	1・2	Spring・Fall	
(S) NA20111	Advanced Strength and Fracture of Materials	HASEGAWA MAKOTO	2	Lectures	1・2	Spring	
(S) NA29811 (F) NA29814	Internship in Materials Engineering L	UMEZAWA OSAMU , et.al.	4	Exercise	1・2	Spring・Fall	
(S) NA29821 (F) NA29824	Internship in Materials Engineering M	UMEZAWA OSAMU , et.al.	2	Exercise	1・2	Spring・Fall	
(S) NA29831 (F) NA29834	Internship in Materials Engineering S	UMEZAWA OSAMU , et.al.	1	Exercise	1・2	Spring・Fall	
(S) NA30061	Aerospace Utilization Engineering	HIGUCHI TAKEHIRO	2	Lectures	1・2	Spring	
(F) NA30214	Optimal Astrodynamics	UENO SEIYA	2	Lectures	1・2	Fall	
(F) NA30224	Aircraft Aerodynamic Design	MIYAJI KOJI	2	Lectures	1・2	Fall	
(S) NA30231	Space Environment Utilization Science	NATSUISAKA MAKOTO	2	Lectures	1・2	Spring	
(S) NA30241	Advanced theory of space system	ITO YASUYUKI	2	Lectures	1・2	Spring	
(S) NA31501 (F) NA31504	Industrial Training in Ocean and Space System Engineering	Each Instructor , et.al.	2	Seminars	1・2	Spring・Fall	
(S) NA31601 (F) NA31604	Overseas Training in Marine and Space System Engineering	Each Instructor , et.al.	2	Seminars	1・2	Spring・Fall	
(S) NA31701 (F) NA31704	Practical Engineering Training in Ocean-Space	Each Instructor , et.al.	4	Seminars	1・2	Spring・Fall	
(S) NA39811 (F) NA39814	Inntership in Ocean and Space System Engineering L	Each Instructor , et.al.	4	Exercise	1・2	Spring・Fall	
(S) NA39821 (F) NA39824	Inntership in Ocean and Space System Engineering M	Each Instructor , et.al.	2	Exercise	1・2	Spring・Fall	
(S) NA39831 (F) NA39834	Inntership in Ocean and Space System Engineering S	Each Instructor , et.al.	1	Exercise	1・2	Spring・Fall	

Chemistry and Life Science

Studio courses

Module Title	Schedule code	Studio courses name	Instructor	Credits	Style of class	Grade	Term	Remarks
Analysis Technology for Advanced Process Engineering	(S) NB25101	Advanced Chemical Process Analysis Studio S	AIHARA MASAHIKO , et.al.	4	Exercise	1	Spring	
	(F) NB25204	Advanced Chemical Process Analysis Studio F	AIHARA MASAHIKO , et.al.	4	Exercise	1	Fall	
Technology Innovation for Next-generation Process Engineering	(S) NB25301	New Generation Chemical Process Engineering Studio S	AIHARA MASAHIKO , et.al.	4	Exercise	2	Spring	
	(F) NB25404	New Generation Chemical Process Engineering Studio F	AIHARA MASAHIKO , et.al.	4	Exercise	2	Fall	
Analysis Technology for Energy Creation	(S) NB25501	Exercise in Analysis for Energy Creation S	TAKAHASHI KOJI , et.al.	4	Exercise	1	Spring	
	(F) NB25604	Exercise in Analysis for Energy Creation F	TAKAHASHI KOJI , et.al.	4	Exercise	1	Fall	
Technology Innovation for Energy Creation	(S) NB25701	Exercise in Technology for Energy Creation S	TAKAHASHI KOJI , et.al.	4	Exercise	2	Spring	
	(F) NB25804	Exercise in Technology for Energy Creation F	TAKAHASHI KOJI , et.al.	4	Exercise	2	Fall	
Analysis Technology for Life Science	(S) NB25901	Analysis Studio S in Biotechnologies and Life Sciences	TAKEDA MINORU , et.al.	4	Exercise	1	Spring	
	(F) NB26004	Analysis Studio F in Biotechnologies and Life Sciences	TAKEDA MINORU , et.al.	4	Exercise	1	Fall	
Technology Innovation for Life Science	(S) NB26101	Synthesis Studio S in Biotechnologies and Life Sciences	TAKEDA MINORU , et.al.	4	Exercise	2	Spring	
	(F) NB26204	Synthesis Studio F in Biotechnologies and Life Sciences	TAKEDA MINORU , et.al.	4	Exercise	2	Fall	

Related Lecture courses that make up the module

Schedule code	Course name	Instructor	Credits	Style of class	Grade	Term	Remarks
(F) NB10214	Structural Biology	CHOJIRO KOJIMA	2	Lectures	1・2	Fall	
(S) NB10221	Chemical Astrobiology	KOBAYASHI KENSEI , et.al.	2	Lectures	1・2	Spring	
(S) NB20051	Basic Energy Chemistry	MITSUSHIMA SHIGENORI , et.al.	2	Lectures	1・2	Spring	
(F) NB20064	Materials Science for Energy Conversion	MATSUZAWA KOICHI	2	Lectures	1・2	Fall	
(S) NB20071	Functional Genome Science	KURIHARA YASUYUKI	2	Lectures	1・2	Spring	
(F) NB20084	Materials for Strength Components	TAKAHASHI KOJI	2	Lectures	1・2	Fall	
(F) NB20094	Fluid Chemical Engineering	KAMINOYAMA MEGURU	2	Lectures	1・2	Fall	
(F) NB20104	Environmental Separation Engineering	NAKAMURA KAZUHO	2	Lectures	1・2	Fall	
(F) NB20114	Introduction to Energy Value Chain System	MUGIKURA YOSHIHIRO	2	Lectures	1・2	Fall	
(F) NB20124	Fuel Cell Technology	MORITA HIROSHI	2	Lectures	1・2	Fall	
(S) NB20131	Ceramics and Energy Technologies	YAMAMOTO TOHRU	2	Lectures	1・2	Spring	
(S) NB20141	Developmental Engineering	SUZUKI ATSUSHI	2	Lectures	1・2	Spring	
(S) NB20151	Risk Analysis	SUYAMA KOICHI , et.al.	2	Lectures	1・2	Spring	
(F) NB20164	Recurrent Education for Engineering	OKAZAKI SHINJI	2	Lectures	1・2	Fall	
(F) NB20174	Mixing for Chemical Engineering	KAMINOYAMA MEGURU	2	Lectures	1・2	Fall	
(S) NB20181	Material Production Technology	HABUKA HITOSHI	2	Lectures	1・2	Spring	
(S) NB20191	Microbial Biotechnology	TAKEDA MINORU	2	Lectures	1・2	Spring	
(F) NB20204	Medical Engineering	FUKUDA JUNJI	2	Lectures	1・2	Fall	
(F) NB20214	Technology-Development & Society	KEIKO FUJIOKA , et.al.	2	Lectures	1・2	Fall	

Schedule code	Course name	Instructor	Credits	Style of class	Grade	Term	Remarks
(S) NB20221	Physical Chemistry for Environmental Sciences	YOSHITAKE HIDEAKI	2	Lectures	1・2	Spring	
(S) NB20231	Problem-Based Learning in Chemistry Applications and Life Science	Each Instructor , et.al.	2	Lectures	1・2	Spring	
(S) NB20241	Simulation for Chemical Processes	YAMAMOTO HIROSHI , et.al.	2	Lectures	1・2	Spring	
(F) NB20254	Functional Materials Science	KANAI TOSHIMITSU	2	Lectures	1・2	Fall	
(S) NB20261	Tissue Engineering and Regenerative Medicine	FUKUDA JUNJI	2	Lectures	1・2	Spring	
(S) NB20271	Materials Engineering for Machinery and Apparatus	TAKAHASHI KOJI	2	Lectures	1・2	Spring	
(S) NB29811 (F) NB29814	Internship L in Chemistry Applications and Life Science	Each Instructor , et.al.	4	Exercise	1・2	Spring・Fall	
(S) NB29821 (F) NB29824	Internship M in Chemistry Applications and Life Science	Each Instructor , et.al.	2	Exercise	1・2	Spring・Fall	
(S) NB29831 (F) NB29834	Internship S in Chemistry Applications and Life Science	Each Instructor , et.al.	1	Exercise	1・2	Spring・Fall	

Mathematics, Physics, Electrical Engineering and Computer Science

Studio courses

Module Title	Schedule code	Studio courses name	Instructor	Credits	Style of class	Grade	Term	Remarks
VLSI Design	(S) NC35101	VLSI Design S	HANEJI NOBUO , et.al.	4	Exercise	1・2	Spring	
	(F) NC35204	VLSI Design F	HANEJI NOBUO , et.al.	4	Exercise	1・2	Fall	
Open Source Engineering	(S) NC35301	Practical Open Source Engineering S	KURAMITSU KIMIO , et.al.	4	Exercise	1・2	Spring	
	(F) NC35404	Practical Open Source Engineering F	KURAMITSU KIMIO , et.al.	4	Exercise	1・2	Fall	
Control	(S) NC35501	Motion Control S	FUJIMOTO YASUTAKA , et.al.	4	Exercise	1・2	Spring	
	(F) NC35604	Motion Control F	FUJIMOTO YASUTAKA , et.al.	4	Exercise	1・2	Fall	
Nanoelectronics	(S) NC35701	Nanoelectronics S	OYA TAKAHIDE , et.al.	4	Exercise	1・2	Spring	
	(F) NC35804	Nanoelectronics F	OYA TAKAHIDE , et.al.	4	Exercise	1・2	Fall	
Computation Techniques of Light Waves	(S) NC35901	Computation Techniques of Light Waves S	BABA TOSHIHIKO , et.al.	4	Exercise	1・2	Spring	
	(F) NC36004	Computation Techniques of Light Waves F	BABA TOSHIHIKO , et.al.	4	Exercise	1・2	Fall	
Science, Engineering and Design of Antennas	(S) NC36101	Science, Engineering and Design of Antennas S	KUGA NOBUHIRO , et.al.	4	Exercise	1・2	Spring	
	(F) NC36204	Science, Engineering and Design of Antennas F	KUGA NOBUHIRO , et.al.	4	Exercise	1・2	Fall	
Information and Communication Technology	(S) NC36301	Information and Communication Technology S	OCHIAI HIDEKI , et.al.	4	Exercise	1・2	Spring	
	(F) NC36404	Information and Communication Technology F	OCHIAI HIDEKI , et.al.	4	Exercise	1・2	Fall	
Electric Energy Supplies	(S) NC36501	Electric Energy Supplies S	TSUJI TAKAO , et.al.	4	Exercise	1・2	Spring	
	(F) NC36604	Electric Energy Supplies F	TSUJI TAKAO , et.al.	4	Exercise	1・2	Fall	
Advanced Electronics and Materials	(S) NC36701	Advanced Electronics and Materials S	YOSHIKAWA NOBUYUKI , et.al.	4	Exercise	1・2	Spring	
	(F) NC36804	Advanced Electronics and Materials F	YOSHIKAWA NOBUYUKI , et.al.	4	Exercise	1・2	Fall	
Integrated Electronics	(S) NC36901	Integrated Electronics S	HANEJI NOBUO , et.al.	4	Exercise	1・2	Spring	
	(F) NC37004	Integrated Electronics F	HANEJI NOBUO , et.al.	4	Exercise	1・2	Fall	
Electrical and Computer Engineering for Future Medical Care and Welfare	(S) NC37101	Electrical and Computer Engineering for Future Medical Care and Welfare S	YOSHIKAWA NOBUYUKI , et.al.	4	Exercise	1・2	Spring	
	(F) NC37204	Electrical and Computer Engineering for Future Medical Care and Welfare F	YOSHIKAWA NOBUYUKI , et.al.	4	Exercise	1・2	Fall	
Environment Adaptive Smart Systems	(S) NC37301	Environment Adaptive Smart Systems S	SHIMONO TOMOYUKI , et.al.	4	Exercise	1・2	Spring	
	(F) NC37404	Environment Adaptive Smart Systems F	SHIMONO TOMOYUKI , et.al.	4	Exercise	1・2	Fall	
Wireless Communication Systems	(S) NC37501	Wireless Communication Systems S	ICHIGE KOICHI , et.al.	4	Exercise	1・2	Spring	
	(F) NC37604	Wireless Communication Systems F	ICHIGE KOICHI , et.al.	4	Exercise	1・2	Fall	
Advanced Photonics	(S) NC37701	Advanced Photonics S	ARAKAWA TARO , et.al.	4	Exercise	1・2	Spring	
	(F) NC37804	Advanced Photonics F	ARAKAWA TARO , et.al.	4	Exercise	1・2	Fall	
High Information Network Systems	(S) NC37901	High Information Network Systems S	HAMAGAMI TOMOKI , et.al.	4	Exercise	1・2	Spring	
	(F) NC38004	High Information Network Systems F	HAMAGAMI TOMOKI , et.al.	4	Exercise	1・2	Fall	

Related Lecture courses that make up the module

Schedule code	Course name	Instructor	Credits	Style of class	Grade	Term	Remarks
(S) N000051	Engineering Ethics for Risk Management	TAKADA HAJIME , et.al.	2	Lectures	1	Spring	
(S) NC30101	Nano photonics	NISHIJIMA YOSHIAKI	2	Lectures	1・2	Spring	
(S) NC30131	Power System Planning	OYAMA TSUTOMU	2	Lectures	1・2	Spring	
(S) NC30141	Advanced Semiconductor Physics	HANEJI NOBUO	2	Lectures	1・2	Spring	
(S) NC30151	Microelectronics	HIRAKAWA KAZUHIKO	2	Lectures	1・2	Spring	
(F) NC30164	Semiconductor Optoelectronics	ARAKAWA TARO	2	Lectures	1・2	Fall	
(S) NC30171	Information & Communications Infrastructure	SOICHI WATANABE	2	Lectures	1・2	Spring	
(F) NC30184	Multimedia Mobile Communication Networks	HIROYUKI TSUJI	2	Lectures	1・2	Fall	
(S) NC30191	Microwave Engineering	KUGA NOBUHIRO	2	Lectures	1・2	Spring	
(F) NC30204	Fault Tolerant Systems	TANAKA HIROKAZU	2	Lectures	1・2	Fall	
(S) NC30211	Advanced Electromagnetism	HIDAKA KUNIHIKO	2	Lectures	1・2	Spring	
(S) NC30221	Functional Programming	KURAMITSU KIMIO	2	Lectures	1・2	Spring	
(F) NC30234	CMOS Analog Circuit Design	OGAWA ATSUSHI	2	Lectures	1・2	Fall	
(S) NC30241	Integrated Nanodevices	OYA TAKAHIDE	2	Lectures	1・2	Spring	
(F) NC30254	Advanced Electronic Devices	TAKEMURA YASUSHI	2	Lectures	1・2	Fall	
(S) NC30261	Colloquium in Medical Engineering and Informatics Based on Information Communication Technology	SHIMONO TOMOYUKI	2	Lectures	1・2	Spring	
(S) NC30271	A Basis of Smartgrid Technology	TSUJI TAKAO	2	Lectures	1・2	Spring	
(S) NC30281	Superconducting Electronics	YAMANASHI YUKI	2	Lectures	1・2	Spring	
(F) NC30294	Measurement of Mobile Antenna Systems	ARAI HIROYUKI	2	Lectures	1・2	Fall	
(S) NC30301	Motion Control Systems	SHIMONO TOMOYUKI	2	Lectures	1・2	Spring	
(F) NC30314	Human Factors and Ergonomics	SHIMA KEISUKE	2	Lectures	1・2	Fall	
(S) NC30381	Multimedia Wireless Communication Networks	RI KANHOU	2	Lectures	1・2	Spring	
(S) NC39811 (F) NC39814	Overseas Internships in Applied Physics L	Each Instructor of Applied Physics , et.al.	4	Exercise	1・2	Spring・Fall	
(S) NC39821 (F) NC39824	Overseas Internships in Applied Physics M	Each Instructor of Applied Physics , et.al.	2	Exercise	1・2	Spring・Fall	
(S) NC39831 (F) NC39834	Overseas Internships in Applied Physics S	Each Instructor of Applied Physics , et.al.	1	Exercise	1・2	Spring・Fall	

VI-4 Doctoral programs

<Pi-type Engineering Degree (PED) Program>

【specialized module】

Mechanical Engineering, Materials Science, and Ocean Engineering

Studio courses

Module Title	Schedule code	Studio courses name	Instructor	Credits	Style of class	Grade	Term	Remarks
Advanced Design of Processing Systems	(S) QA15101 (F) QA15104	Sub-Research Studio A in Mechanical Engineering	Each Instructor (Mechanical Engineering)	2	Exercise	1･2･3	Spring･Fall	
	(S) QA15201 (F) QA15204	Sub-Research Studio B in Mechanical Engineering	Each Instructor (Mechanical Engineering)	2	Exercise	1･2･3	Spring･Fall	

Related Lecture courses that make up the module

Schedule code	Course name	Instructor	Credits	Style of class	Grade	Term	Remarks
(S) QA10021	Advanced Ultra High-speed Machining	SHINOZUKA JUN	2	Lectures	1	Spring	
(F) QA10034	Advanced Lectures on Fracture Mechanics	AKINIWA YOSHIAKI	2	Lectures	1	Fall	
(S) QA10081	Advanced Lectures on Elastoplasticity Theory	OZAKI SHINGO	2	Lectures	1･2	Spring	
(S) QA10101	Non-linear Structural Simulation	YU QIANG	2	Lectures	1･2	Spring	
(S) QA10161	Optical Microfabrication Engineering	MARUO SHOJI	2	Lectures	1･2	Spring	
(F) QA10204	Advanced Thin Film Fabrication	HIROKI OHTA	2	Lectures	1･2	Fall	
(F) QA10214	Thermal and Fluid Engineering for Electric Rotating Machinery	KABATA YASUO	2	Lectures	1･2･3	Fall	
(F) QA10224	Virtual Design Engineering	IWAKI CHIKAKO	2	Lectures	1･2･3	Fall	
(F) QA10234	Surface Treatment Technology	WADA KUNIHIKO	2	Lectures	1･2･3	Fall	
(S) QA19811 (F) QA19814	Overseas Internship in Mechanical Engineering	Each Instructor (Mechanical Engineering)	1	Exercise	1･2･3	Spring･Fall	

Studio courses

Module Title	Schedule code	Studio courses name	Instructor	Credits	Style of class	Grade	Term	Remarks
Advanced Design of Thermal and Fluid Systems	(S) QA15101 (F) QA15104	Sub-Research Studio A in Mechanical Engineering	Each Instructor (Mechanical Engineering)	2	Exercise	1･2･3	Spring･Fall	
	(S) QA15201 (F) QA15204	Sub-Research Studio B in Mechanical Engineering	Each Instructor (Mechanical Engineering)	2	Exercise	1･2･3	Spring･Fall	

Related Lecture courses that make up the module

Schedule code	Course name	Instructor	Credits	Style of class	Grade	Term	Remarks
(S) QA10041	Advanced Turbo Machinery	MATSUI JUN	2	Lectures	1･2･3	Spring	
(S) QA10051	Advanced Rarefied Gas Dynamics	MATSUMOTO HIROAKI	2	Lectures	1･2	Spring	
(F) QA10074	Space Propulsion Engineering, Advanced	YOSHINORI TAKAO	2	Lectures	1･2	Fall	
(F) QA10094	Advanced Computational Fluid Dynamics	KITAMURA KEIICHI	2	Lectures	1･2	Fall	
(F) QA10134	Thermo-Fluid Dynamics of Combustion	ISHI KAZUHIRO	2	Lectures	1･2･3	Fall	
(F) QA10144	Topics on Applied fluid dynamics	HYAKUTAKE TORU	2	Lectures	1･2	Fall	
(S) QA10151	Turbulence Measurement	NISHINO KOICHI	2	Lectures	1･2･3	Spring	
(S) QA10171	Advanced Combined Heat Transfer	SAKAI SEIGO	2	Lectures	1･2･3	Spring	
(F) QA10184	Advanced Applied Thermofluid Engineering	ARAKI TAKUTO	2	Lectures	1･2･3	Fall	
(S) QA19811 (F) QA19814	Overseas Internship in Mechanical Engineering	Each Instructor (Mechanical Engineering)	1	Exercise	1･2･3	Spring･Fall	

Studio courses

Module Title	Schedule code	Studio courses name	Instructor	Credits	Style of class	Grade	Term	Remarks
Advanced Design of Integrated Systems	(S) QA15101 (F) QA15104	Sub-Research Studio A in Mechanical Engineering	Each Instructor (Mechanical Engineering)	2	Exercise	1・2・3	Spring・Fall	
	(S) QA15201 (F) QA15204	Sub-Research Studio B in Mechanical Engineering	Each Instructor (Mechanical Engineering)	2	Exercise	1・2・3	Spring・Fall	

Related Lecture courses that make up the module

Schedule code	Course name	Instructor	Credits	Style of class	Grade	Term	Remarks
(F) QA10014	Advanced Mechatronics Design	SATO YASUKAZU	2	Lectures	1・2	Fall	
(S) QA10061	Robotic Manipulation	MAEDA YUUSUKE	2	Lectures	1	Spring	
(F) QA10114	In-depth lecture on micro manipulation	FUCHIWAKI OHMI	2	Lectures	2	Fall	
(F) QA10124	Special issues on mechanical system control	SANADA KAZUSHI	2	Lectures	1	Fall	
(F) QA10194	Advanced Cyber-Robotics	KATO RYU	2	Lectures	1・2	Fall	
(S) QA19811 (F) QA19814	Overseas Internship in Mechanical Engineering	Each Instructor (Mechanical Engineering)	1	Exercise	1・2・3	Spring・Fall	

Studio courses

Module Title	Schedule code	Studio courses name	Instructor	Credits	Style of class	Grade	Term	Remarks
Advanced Materials Design	(S) QA25101 (F) QA25104	Sub-research exercise in Materials Engineering	UMEZAWA OSAMU , et.al.	4	Seminars	1・2・3	Spring・Fall	

Related Lecture courses that make up the module

Schedule code	Course name	Instructor	Credits	Style of class	Grade	Term	Remarks
(S) QA20011	Optical Semiconductor Technology	MUKAI KOKI	2	Lectures	1・2	Spring	
(S) QA20021	Advanced Fracture Mechanics of Materials	HASEGAWA MAKOTO	2	Lectures	1・2	Spring	
(S) QA20031	Special lecture of multi-functional composites	NAKAO WATARU	2	Lectures	1・2	Spring	
(F) QA20044	Advanced Material Forming Process	MAENO TOMOYOSHI	2	Lectures	1・2	Fall	
(F) QA20054	Advanced Functional Material Engineering	NAKATSUGAWA HIROSHI	2	Lectures	1・2	Fall	
(F) QA20064	Fatigue of Metallic Materials	UMEZAWA OSAMU	2	Lectures	1・2	Fall	
(F) QA20074	Local Equilibrium Theory	HIROSAWA SHOICHI	2	Lectures	1・2	Fall	
(F) QA20084	Leading-edge Materials Engineering	UMEZAWA OSAMU , et.al.	2	Lectures	1・2	Fall	
(F) QA20094	Application of Design and Engineering of High-Temperature Structural Materials	TODA YOSHIAKI	2	Lectures	1・2	Fall	
(F) QA20104	Advanced Computational Modeling of Phase Transformation and Microstructure Evolution	SHIMONO MASATO	2	Lectures	1・2	Fall	
(F) QA20114	Microstructure Design in Advanced Materials	MITARAI YOKO	2	Lectures	1・2	Fall	
(S) QA20121	Advanced thin film technology	OHTAKE TITSURU	2	Lectures	1・2・3	Spring	
(S) QA29811 (F) QA29814	International Internships in Materials Engineering	UMEZAWA OSAMU , et.al.	1	Exercise	1・2・3	Spring・Fall	

Studio courses

Module Title	Schedule code	Studio courses name	Instructor	Credits	Style of class	Grade	Term	Remarks
Macro System Design	(S) QA35101 (F) QA35104	Sub-Research Studio (Ocean and Space Engineering)	Each Instructor	4	Seminars	1・2・3	Spring・Fall	

Related Lecture courses that make up the module

Schedule code	Course name	Instructor	Credits	Style of class	Grade	Term	Remarks
(F) QA30014	Advanced Exercises in Computational Hydrodynamics	HINO TAKANORI	2	Lectures	1・2・3	Fall	
(F) QA30024	Structural Information System	KAWAMURA YASUMI	2	Lectures	1・2・3	Fall	
(F) QA30034	Advanced Ship and Marine Structural Design Methodologies	OKADA TETSUO	2	Lectures	1・2・3	Fall	
(S) QA30041	Advanced Spacecraft Attitude Control	UENO SEIYA	2	Lectures	1・2・3	Spring	
(F) QA30054	Advanced Seakeeping Qualities	HIRAKAWA YOSHIAKI	2	Lectures	1・2・3	Fall	
(S) QA30061	Advanced Aircraft Aerodynamic Design	MIYAJI KOJI	2	Lectures	1・2・3	Spring	
(S) QA30071	Advanced Ocean Resources and Energy Engineering	NISHI YOSHIKI	2	Lectures	1・2・3	Spring	
(F) QA30084	Advanced Theory in Dynamics of Floating Bodies Engineering	MURAI MOTOHIKO	2	Lectures	1・2・3	Fall	
(F) QA30094	Advanced Aerospace Utilization Engineering	HIGUCHI TAKEHIRO	2	Lectures	1・2・3	Fall	
(F) QA30104	Advanced Engineering Turbulence	YOUHEI TAKAGI	2	Lectures	1・2・3	Fall	
(F) QA30114	Advanced Maritime Traffic Safety	FUKUTO JUNJI , et.al.	2	Lectures	1・2・3	Fall	
(S) QA30121	Advanced Engineering for Ocean Development	KATOH SYUNJI , et.al.	2	Lectures	1・2・3	Spring	
(S) QA30131	Advanced Systems Engineering Theory of Ship Design	MITSUYUKI TAIGA	2	Lectures	1・2・3	Spring	
(S) QA39811 (F) QA39814	International Internship in Ocean and Space System Engineering	Each Instructor , et.al.	1	Exercise	1・2・3	Spring・Fall	

Chemistry and Life Science

Studio courses

Module Title	Schedule code	Studio courses name	Instructor	Credits	Style of class	Grade	Term	Remarks
Innovation and Instrumentation engineering for Life Science	(S) QB25101	Engineering in Biology, Medicine and Bioanalytical Chemistry, Practice S	OKAZAKI SHINJI , et.al.	4	Exercise	1･2･3	Spring	
	(F) QB25204	Engineering in Biology, Medicine and Bioanalytical Chemistry, Practice F	OKAZAKI SHINJI , et.al.	4	Exercise	1･2･3	Fall	

Related Lecture courses that make up the module

Schedule code	Course name	Instructor	Credits	Style of class	Grade	Term	Remarks
(F) QB10134	Astrobiology Special Lecture	KEBUKAWA YOKO	2	Lectures	1･2･3	Fall	
(F) QB10144	Functional Structural Biology	CHOJIRO KOJIMA	2	Lectures	1･2･3	Fall	
(F) QB10174	Advanced Structural Life Science	KAWAMURA IZURU	2	Lectures	1･2･3	Fall	
(F) QB20014	Industrial materials and materials chemistry	OKAZAKI SHINJI	2	Lectures	1･2･3	Fall	
(S) QB20021	Electrochemical Materials	MATSUZAWA KOICHI	2	Lectures	1･2･3	Spring	
(F) QB20034	Advanced Energy Chemistry	MITSUSHIMA SHIGENORI , et.al.	2	Lectures	1･2･3	Fall	
(F) QB20044	Materials for Energy Machines	TAKAHASHI KOJI	2	Lectures	1･2･3	Fall	
(S) QB20051	Energy Value Chain System	MUGIKURA YOSHIHIRO	2	Lectures	1･2･3	Spring	
(S) QB20061	Energy Conversion Technology	MORITA HIROSHI	2	Lectures	1･2･3	Spring	
(F) QB20074	Material Science for Energy applications	YAMAMOTO TOHRU	2	Lectures	1･2･3	Fall	
(S) QB20081	Environmental Energy Engineering	OKUYAMA KUNITO , et.al.	2	Lectures	1･2･3	Spring	
(S) QB20091	Reactor and Process Design	HABUKA HITOSHI	2	Lectures	1･2･3	Spring	
(S) QB20101	Chemical Energy Engineering	AIHARA MASAHIKO	2	Lectures	1･2･3	Spring	
(F) QB20114	Separation Engineering Excerptus	NAKAMURA KAZUHO	2	Lectures	1･2･3	Fall	
(S) QB20121	Biopolymer Engineering	TAKEDA MINORU	2	Lectures	1･2･3	Spring	
(F) QB20134	Advanced Medical Engineering	FUKUDA JUNJI	2	Lectures	1･2･3	Fall	
(S) QB20141	Chemical Reactions in the Environment	YOSHITAKE HIDEAKI	2	Lectures	1･2･3	Spring	
(F) QB20154	Biology of Phenome	KURIHARA YASUYUKI	2	Lectures	1･2･3	Fall	
(F) QB20164	Advanced Devlopmental Engineering	SUZUKI ATSUSHI	2	Lectures	1･2･3	Fall	
(F) QB20174	Advanced Functional Materials Science	KANAI TOSHIMITSU	2	Lectures	1･2･3	Fall	
(S) QB20181	Special Lecture in Tissue Engineering and Regenerative Medicine	FUKUDA JUNJI	2	Lectures	1･2･3	Spring	
(S) QB29821 (F) QB29824	PED International Internship in Chemistry Applications and Life Science	Each Instructor , et.al.	1	Exercise	1･2･3	Spring･Fall	

Studio courses

Module Title	Schedule code	Studio courses name	Instructor	Credits	Style of class	Grade	Term	Remarks
Innovative Chemical Process	(S) QB25301	Innovative Chemical Process Engineering Studio S	OKUYAMA KUNITO , et.al.	4	Exercise	1･2･3	Spring	
	(F) QB25404	Innovative Chemical Process Engineering StudioF	OKUYAMA KUNITO , et.al.	4	Exercise	1･2･3	Fall	
Advanced Energy Creation	(S) QB25501	Exercise in Advanced Energy Creation S	OKAZAKI SHINJI , et.al.	4	Exercise	1･2･3	Spring	
	(F) QB25604	Exercise in Advanced Energy Creation F	OKAZAKI SHINJI , et.al.	4	Exercise	1･2･3	Fall	

Related Lecture courses that make up the module

Schedule code	Course name	Instructor	Credits	Style of class	Grade	Term	Remarks
(F) QB20014	Industrial materials and materials chemistry	OKAZAKI SHINJI	2	Lectures	1･2･3	Fall	
(S) QB20021	Electrochemical Materials	MATSUZAWA KOICHI	2	Lectures	1･2･3	Spring	
(F) QB20034	Advanced Energy Chemistry	MITSUSHIMA SHIGENORI , et.al.	2	Lectures	1･2･3	Fall	
(F) QB20044	Materials for Energy Machines	TAKAHASHI KOJI	2	Lectures	1･2･3	Fall	
(S) QB20051	Energy Value Chain System	MUGIKURA YOSHIHIRO	2	Lectures	1･2･3	Spring	
(S) QB20061	Energy Conversion Technology	MORITA HIROSHI	2	Lectures	1･2･3	Spring	
(F) QB20074	Material Science for Energy applications	YAMAMOTO TOHRU	2	Lectures	1･2･3	Fall	
(S) QB20081	Environmental Energy Engineering	OKUYAMA KUNITO , et.al.	2	Lectures	1･2･3	Spring	
(S) QB20091	Reactor and Process Design	HABUKA HITOSHI	2	Lectures	1･2･3	Spring	
(S) QB20101	Chemical Energy Engineering	AIHARA MASAHIKO	2	Lectures	1･2･3	Spring	
(F) QB20114	Separation Engineering Excerptus	NAKAMURA KAZUHO	2	Lectures	1･2･3	Fall	
(S) QB20121	Biopolymer Engineering	TAKEDA MINORU	2	Lectures	1･2･3	Spring	
(F) QB20134	Advanced Medical Engineering	FUKUDA JUNJI	2	Lectures	1･2･3	Fall	
(S) QB20141	Chemical Reactions in the Environment	YOSHITAKE HIDEAKI	2	Lectures	1･2･3	Spring	
(F) QB20154	Biology of Phenome	KURIHARA YASUYUKI	2	Lectures	1･2･3	Fall	
(F) QB20164	Advanced Devlopmental Engineering	SUZUKI ATSUSHI	2	Lectures	1･2･3	Fall	
(F) QB20174	Advanced Functional Materials Science	KANAI TOSHIMITSU	2	Lectures	1･2･3	Fall	
(S) QB20181	Special Lecture in Tissue Engineering and Regenerative Medicine	FUKUDA JUNJI	2	Lectures	1･2･3	Spring	
(S) QB29821 (F) QB29824	PED International Internship in Chemistry Applications and Life Science	Each Instructor , et.al.	1	Exercise	1･2･3	Spring･Fall	

Studio courses

Module Title	Schedule code	Studio courses name	Instructor	Credits	Style of class	Grade	Term	Remarks
Electronics Mounting Engineering	(S) QB25701	Electronics JISSO Studio S	HABUKA HITOSHI , et.al.	4	Exercise	1･2･3	Spring	
	(F) QB25804	Electronics JISSO Studio F	HABUKA HITOSHI , et.al.	4	Exercise	1･2･3	Fall	

Related Lecture courses that make up the module

Schedule code	Course name	Instructor	Credits	Style of class	Grade	Term	Remarks
(S) QA10101	Non-linear Structural Simulation	YU QIANG	2	Lectures	1･2	Spring	
(S) QB10061	Chemistry of Functional Polymers	OYAMA TOSHIYUKI	2	Lectures	1･2･3	Spring	
(F) QB20044	Materials for Energy Machines	TAKAHASHI KOJI	2	Lectures	1･2･3	Fall	
(S) QB20081	Environmental Energy Engineering	OKUYAMA KUNITO , et.al.	2	Lectures	1･2･3	Spring	
(S) QB20091	Reactor and Process Design	HABUKA HITOSHI	2	Lectures	1･2･3	Spring	
(S) QB20141	Chemical Reactions in the Environment	YOSHITAKE HIDEAKI	2	Lectures	1･2･3	Spring	
(F) QC30174	Advanced Semiconductor Devices	HANEJI NOBUO	2	Lectures	1･2･3	Fall	

Mathematics, Physics, Electrical Engineering and Computer Science

Studio courses

Module Title	Schedule code	Studio courses name	Instructor	Credits	Style of class	Grade	Term	Remarks
System Design	(F) QC35104	Practical System Design	HAMAGAMI TOMOKI , et.al.	4	Exercise	1･2･3	Fall	

Related Lecture courses that make up the module

Schedule code	Course name	Instructor	Credits	Style of class	Grade	Term	Remarks
(F) QC30024	Advanced Antennas and Propagation Engineering II	ARAI HIROYUKI	2	Lectures	1･2･3	Fall	
(S) QC30031	Special Issues On Open Source Study	KURAMITSU KIMIO	2	Lectures	1･2･3	Spring	
(F) QC30054	Advanced Digital Circuit Theory	ICHIGE KOICHI	2	Lectures	1･2･3	Fall	
(S) QC30071	Advanced Microwave Engineering	KUGA NOBUHIRO	2	Lectures	1･2･3	Spring	
(F) QC30084	Advanced Multimedia Mobile Communication Networks	HIROYUKI TSUJI	2	Lectures	1･2･3	Fall	
(S) QC30121	Advanced Topics of Information Theory	KOHNO RYUJI	2	Lectures	1･2･3	Spring	
(S) QC30131	Advanced Intelligent Systems	HAMAGAMI TOMOKI	2	Lectures	1･2･3	Spring	
(S) QC30181	Advanced Coding Theory	OCHIAI HIDEKI	2	Lectures	1･2･3	Spring	
(F) QC30214	Advanced Biomedical System Engineering	SHIMA KEISUKE	2	Lectures	1･2･3	Fall	
(S) QC39831 (F) QC39834	International Internships in Electrical and Computer Engineering	Each Instructor , et.al.	1	Exercise	1･2･3	Spring･Fall	

Studio courses

Module Title	Schedule code	Studio courses name	Instructor	Credits	Style of class	Grade	Term	Remarks
System Device	(F) QC35204	System Device Studio	HANEJI NOBUO , et.al.	4	Exercise	1･2･3	Fall	

Related Lecture courses that make up the module

Schedule code	Course name	Instructor	Credits	Style of class	Grade	Term	Remarks
(F) QC30064	Advanced Data Storage	TAKEMURA YASUSHI	2	Lectures	1･2･3	Fall	
(F) QC30104	Advanced Quantum Optoelectronics	BABA TOSHIHIKO	2	Lectures	1･2･3	Fall	
(F) QC30114	Advanced Integrated Nanodevices	OYA TAKAHIDE	2	Lectures	1･2･3	Fall	
(S) QC30141	Advanced Superconductivity Electronics	YOSHIKAWA NOBUYUKI	2	Lectures	1･2･3	Spring	
(F) QC30174	Advanced Semiconductor Devices	HANEJI NOBUO	2	Lectures	1･2･3	Fall	
(F) QC30194	Seminar in Quantum Effect Devices	ARAKAWA TARO	2	Lectures	1･2･3	Fall	
(S) QC30201	Advanced Integrated Quantum Devices	YAMANASHI YUKI	2	Lectures	1･2･3	Spring	
(S) QC30221	Advanced in Nanophotonics	NISHIJIMA YOSHIAKI	2	Lectures	1･2･3	Spring	
(S) QC39831 (F) QC39834	International Internships in Electrical and Computer Engineering	Each Instructor , et.al.	1	Exercise	1･2･3	Spring･Fall	

Studio courses

Module Title	Schedule code	Studio courses name	Instructor	Credits	Style of class	Grade	Term	Remarks
Energy and Control	(F) QC35304	Energy and Control Practice	FUJIMOTO YASUTAKA , et.al.	4	Exercise	1・2・3	Fall	

Related Lecture courses that make up the module

Schedule code	Course name	Instructor	Credits	Style of class	Grade	Term	Remarks
(S) QC30041	Advanced Theory of Systems, Control and Information	FUJIMOTO YASUTAKA	2	Lectures	1・2・3	Spring	
(F) QC30094	Advanced Mechatronics	SHIMONO TOMOYUKI	2	Lectures	1・2・3	Fall	
(S) QC30151	Advanced Power System Engineering	OYAMA TSUTOMU	2	Lectures	1・2・3	Spring	
(F) QC30164	Advanced Technology in Power System Protection and Control	TSUJI TAKAO	2	Lectures	1・2・3	Fall	
(S) QC39831 (F) QC39834	International Internships in Electrical and Computer Engineering	Each Instructor , et.al.	1	Exercise	1・2・3	Spring・Fall	

Studio courses

Module Title	Schedule code	Studio courses name	Instructor	Credits	Style of class	Grade	Term	Remarks
Medicine and Engineering Integration	(F) QC35404	Design and Development for Medical Information Systems	KOHNO RYUJI , et.al.	4	Exercise	1・2・3	Fall	
	(F) QC35504	Design and Development of Devices for Advanced Medical Applications	KOHNO RYUJI , et.al.	4	Exercise	1・2・3	Fall	
	(F) QC35604	Design and Development of Mechatronics for Advanced Medical Applications	KOHNO RYUJI , et.al.	4	Exercise	1・2・3	Fall	
	(F) QC35704	Studio of Design and Development for Medical-Biomedical Systems	KOHNO RYUJI , et.al.	4	Exercise	1・2・3	Fall	
	(F) QC35804	Studio of Development and Evolution of Innovative Medical-Engineering	KOHNO RYUJI , et.al.	4	Exercise	1・2・3	Fall	

Related Lecture courses that make up the module

Schedule code	Course name	Instructor	Credits	Style of class	Grade	Term	Remarks
(F) QC30064	Advanced Data Storage	TAKEMURA YASUSHI	2	Lectures	1・2・3	Fall	
(F) QC30104	Advanced Quantum Optoelectronics	BABA TOSHIHIKO	2	Lectures	1・2・3	Fall	
(S) QC30131	Advanced Intelligent Systems	HAMAGAMI TOMOKI	2	Lectures	1・2・3	Spring	
(S) QC30141	Advanced Superconductivity Electronics	YOSHIKAWA NOBUYUKI	2	Lectures	1・2・3	Spring	
(S) QC39831 (F) QC39834	International Internships in Electrical and Computer Engineering	Each Instructor , et.al.	1	Exercise	1・2・3	Spring・Fall	