Degree Completion Guide 2015-2016

JAIST
JAPAN
ADVANCED INSTITUTE OF
SCIENCE AND TECHNOLOGY
1990

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The official Degree Completion Guide 2015-2016 is in Japanese, of which this is an English translation.

Courses for Working Professionals are not conducted in English, so there are no descriptions for them in the guide for each school in this English version. Please refer to the Japanese-language edition for the information.

JAIST Founding Principle and Education Policy

Japan Advanced Institute of Science and Technology (JAIST) was established in 1990 as the first national university specializing only in graduate studies in Japan. Since then JAIST has been leading the development of graduate education in Japan through positive introduction and continuous improvement of various new education ideas and systems including admissions in Spring and Fall, quarter system, multiple supervisory system, and minor research project. This pioneering education has been recognized by many industries that hire our graduates.

Having more than 20 years passed after our establishment, however, means that many other universities have come to introduce the same systems. Today JAIST needs to introduce new innovative and effective ideas of its own. In order to improve our education further, we have decided to set “respecting students’ purposes and intentions as much as possible” as a basic principle. Concretely speaking, hopefully we will allow students to design their course selection by themselves based on their career goal.

When graduating, students receive a transcript showing the list of the courses they have taken and their grades. By selecting courses voluntarily, students will be able to explain their reason for the selection of courses and their relevance to their career goal to their supervisor at JAIST and future employers.

JAIST has recently changed its goal on education. We put more emphasis on what ability students have obtained than on what they have understood. Reflecting this idea, every course evaluates students’ performance in terms of the level of ability acquisition. This idea is also shared in the supervision of students in every laboratory.

We hope every student makes the best use of education opportunities at JAIST through their positive commitment in order to prepare for their bright future.

President

Tetsuo Asano

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I. Mission of JAIST

Mission

JAIST endeavors to foster leaders capable of contributing to the making of a future world by creation of science and technology, through its most advanced education and research in an ideal academic environment.

Goals

- JAIST develops leaders in society or industry who hold credible expertise in the frontier science and technology, broad perspectives, high level of autonomy and communication ability, through its systematic advanced graduate education.
- JAIST, to contribute to societies with research outcomes, creates a center of excellence for advancement of researches for solving problems of our world and society and develops new fields through a variety of basic researches.
- JAIST fosters active global human resources by promoting faculty and student exchanges with leading institutes overseas and globalizing its education and research.

The ideal person JAIST strives to educate

JAIST endeavors to foster leaders in society or industry who have credible expertise in the frontiers of science and technology, broad perspectives, a high level of autonomy and communication ability. In the master's program, the focus is on fostering students' ability to understand and apply a variety of fundamental theories in order to solve problems. In the doctoral program, JAIST focuses on cultivating students who have the ability to think from a variety of perspectives, to discover and solve problems and to exercise world-class leadership in the area of advanced science and technology.

Policies

JAIST has set the following policies for students' educational guidance.

Curriculum policy

We designed our curriculum to be hierarchical and systematic, encompassing several specialties so that we may nurture future researchers and engineers who not only possess specialist knowledge in the area of advanced science and technology, but who also fully understand fundamental concepts, have the capability to identify and solve problems, and have the ability to acquire a wide range of relevant advanced expertise. We adopt a supervisory system in which a student is supervised by three professors.

In the master's program, we aim to foster the students' ability to understand and apply a variety of fundamental theories in order to solve problems in the area of advanced science and technology without placing undue emphasis on the expertise in their field of specialization. In addition to a particular academic expertise, we also aim to equip students with qualities to be internationally successful such as ethical awareness, global communication skills, and problem-solving skills.

In the doctoral program, we aim to foster students' ability to understand extensive theories and the framework of the area of advanced science and technology, and apply them to identify and solve problems. In addition, we aim to nurture students who have ethical awareness, global communication skills, the ability to think from a variety of perspectives; to present their research and exchange ideas with researchers overseas; to discover and solve problems; and to exercise leadership in the area of advanced science and technology.

[Institute of General Education]
The mission of the Institute of General Education (IGE) is to equip students with ethical awareness, understanding and receptiveness toward diversified cultures, and the communication skills necessary to be successful internationally. The IGE also aims to help graduates find positions in society based on their individual specialties and strengths.

[School of Knowledge Science]
The mission of the School of Knowledge Science is to enable students to systematically understand basic academic matters to advanced academic issues and equip them with a solid foundation to contribute toward the development of creating, sharing, and utilizing knowledge through active learning such as group work.
We engage in research into natural, individual, organizational, and societal activities from a viewpoint of knowledge creation. We also conduct education and research to explore the mechanisms of creating, sharing, and utilizing knowledge in an excellent educational and research environment to contribute to the development of the interdisciplinary field of knowledge science. Further, we aim to foster future researchers and technical experts who have a high level of knowledge, applied skills, precise judgment, strong communication skills, the ability to identify and solve problems, and the ability to think from a variety of perspectives in order to lead a knowledge-based society.

[School of Information Science]
The mission of the School of Information Science is to enable students to systematically understand basic academic matters to advanced academic issues and to equip them with a solid foundation to contribute to the development of cutting-edge technology through active learning.
While engaging in advanced research and education, we aim to foster future researchers and technical experts who have a high level of knowledge, applied skills, precise judgment, strong communication skills, the ability to identify and solve problems, and the ability to think from a variety of perspectives. These qualities will prepare our students to play a key role in the information society in response to the development of the wide-ranging research fields of information science.

[School of Materials Science]

The mission of the School of Materials Science is to enable students to systematically understand basic academic matters to advanced academic issues and to equip them with a solid foundation to contribute to the development of cutting-edge technology while learning experimental methodology using the latest laboratory equipment.

We engage in advanced education and research in various disciplines integrating physics, chemistry, and biology in a rich academic environment. Furthermore, we aim to foster future researchers and technical experts who have a high level of knowledge, applied skills, precise judgment, strong communication skills, the ability to identify and solve problems, and the ability to think from a variety of perspectives. These qualities will prepare our students to play a key role in supporting the development of materials science.

Laboratory education policy

≪JAIST policy≫

JAIST considers the research education based in the laboratory as an important element of graduate education, similar to coursework. Laboratories give students a versatile educational environment that can enhance various qualities and develop students' potential. This document describes a set of policies pertaining to laboratory education, which has an important role in the process of students' degree completion.

- **Master's program**

JAIST provides students adequate research guidance, which can be one-on-one or in a small group according to individual needs. We take time for students to understand basic theories. We help develop their abilities to apply their knowledge to solve problems. We help students acquire further specialized knowledge and necessary abilities to undertake the whole research process including planning and conducting research with surveys on other related areas, and presenting the research findings.

- **Doctoral program**

JAIST fosters students' abilities to take a macroscopic view, to identify a specific issue in a research field and to discuss the research findings scientifically and logically. We provide students one-on-one research guidance. Students will acquire further specialized knowledge and necessary abilities to undertake the whole research process independently, with a sense of leadership from planning and conducting a research surveys on other related areas, to publicly presenting the research findings.

≪Each school policy≫

In addition to the JAIST policy, each school sets their own policy. These are described below.

[School of Knowledge Science]

- **Master's program**

We develop students' ability to solve specific problems in the field of knowledge science, with a wide range of interdisciplinary thinking and specialized technologies of knowledge science. Students will experience their research planning and writing academic papers in the emergent environment in laboratories with a diverse group of people of different nationalities, experiences and goals.

We develop students' abilities to identify an important topic in the specific knowledge science field, which should be addressed from an interdisciplinary point of view, to theorize it, to solve it using basic and specialized theories and technologies of knowledge science, and to produce results as academic knowledge. Students will experience collaboration work with a variety of local or international organizations based on the work in the emergent environment in laboratories with a diverse group of people of different nationalities, experiences and goals.

[School of Information Science]

- **Master's program**

We produce scientists and engineers with highly advanced technical expertise who are useful to the society by developing students' abilities to solve specific issues in the society based on the basic information science theories and to present the findings publicly to the society. Students will get individual guidance considering their various backgrounds and career goals, and they will learn cooperativeness through laboratory seminars as well.

● **Doctoral program**

We produce scientists and engineers with highly advanced technical expertise who are useful to the society by developing students' abilities to identify specific problems in the society within the information science field, to solve them based on advanced information science theories, and to present the findings publicly at an international conference or in an international journal. Students will receive individual guidance considering their various backgrounds and career goals. They will learn cooperativeness through laboratory seminars and tutoring master's students.

[School of Materials Science]

● **Master's program**

We produce scientists and engineers with highly advanced technical expertise who are useful to the society by developing students' abilities to carry out the whole research process including acquiring specialized knowledge, surveying related researches, planning, experimenting, summarizing and discussing the findings, and presenting the results independently and yet cooperatively with others.

● **Doctoral program**

We produce scientists and engineers with highly advanced technical expertise who are useful to the society by developing students' advanced abilities to be a leader and carry out the whole research process including acquiring specialized knowledge, surveying related researches, planning, experimenting, and discussing the results, and publicly presenting the research findings.

Policy for awarding of M.Sc. and Ph.D. degrees

● Master's program

We award the degree of Masters of Science to students who have:
・acquired the required number of credits
・completed the master's program within the specified number of years
・passed their oral defense and final examinations for a master's thesis or a project report
・global communication skills and ethical awareness
・an understanding of a wide range of basic theories in the field of advanced science and technology
・the ability to apply basic theories to solve problems

[School of Knowledge Science]

Students awarded a master's degree are expected to have acquired the basic theories of the new academic discipline of knowledge science and to understand the mechanisms of creating, sharing, and utilizing knowledge. They should also have the ability to conduct academically and socially meaningful research in a specific area of knowledge science and to have gained substantial specialized knowledge and technical expertise.

[School of Information Science]

Students awarded a master's degree are expected to have acquired a substantial understanding of a wide range of basic theories of information science and have detailed knowledge of relevant information science techniques. They should also possess the ability to conduct research in a specific area of information science in order to contribute to the academic field and society, and have a high degree of specialized knowledge and technical expertise.

[School of Materials Science]

Students awarded a master's degree are expected to realize the importance of, and understand the basic theories and framework of materials science. While exploring the latest developments in related research areas, they should also have developed the ability to solve many challenging problems in materials science, and to possess specialized knowledge and technical expertise.

● Doctoral program

We award the degree of Doctor of Philosophy to students who have:
・acquired the specified number of credits
・completed the doctoral program in the specified number of years
・passed their oral dissertation defense and final examinations
・the ability to think from a variety of perspectives
・global communication skills and ethical awareness
・an understanding of the framework and a wide range of theories in the field of advanced science and technology
・the ability to apply the framework and theories to identify and solve problems
・the ability to be leaders in the field of advanced science and technology

[School of Knowledge Science]

Students awarded a doctoral degree are expected to have acquired the framework and command of a wide variety of theories of the new academic discipline of knowledge science and understand the mechanisms of creating, sharing, and utilizing knowledge. They should also have conducted world-class research in a specific area of knowledge science and possess highly specialized knowledge and technical expertise.

[School of Information Science]

Students awarded a doctoral degree are expected to have acquired the framework and command of a wide range of theories of information science, have detailed knowledge of relevant theories of

information science, and have the ability to formulate and solve problems. Furthermore, they should have conducted world-class research in a specific area of information science to contribute to the society and possess highly specialized knowledge and technical expertise.

[School of Materials Science]

Students awarded a doctoral degree are expected to have understood the basic knowledge and the framework of materials science. With a focus on the relevant areas for the future, they should also have conducted world-class research in a specific area of materials science, and possess highly specialized knowledge and technical expertise.

Ⅱ.Academic Calendar 2015-2016

First Semester (April 1 - September 30)	April 1 (Wed.) - April 5 (Sun.)	Spring Break
	April 6 (Mon.)	Entrance Ceremony
	April 4 (Sat.) PM	Orientation at Tokyo Satellite
	April 7 (Tue.)	Orientation at Ishikawa Campus
	April 8 (Wed.) - June 5 (Fri.) **NOTE***	Term 1-1
	June 8 (Mon.)	Safty Guidance
	June 9 (Tue.)	No Class Day
	June 10 (Wed.) - August 3 (Mon.)	Term 1-2
	June 24 (Wed.)	Degree Conferment Ceremony
	August 4 (Tue.) - September 30 (Wed.)	Summer Intensive
	August 4 (Tue.) - August 31 (Mon.)	Summer Break
	August 12 (Wed.) - August 14 (Fri.)	School Office Closed (Summer Break)
	September 24 (Thu.)	Degree Conferment Ceremony
	NOTE* The first class of B101 (in Japanese) is held on April 8. All courses except B101 start on April 9 and the day follws the WEDNESDAY schedule. June 5 follows the MONDAY shcedule.	
Second Semester (October 1 - March 31)	October 1 (Thu.)	School Office Closed (JAIST Anniversary)
	October 2 (Fri.)	Entrance Ceremony
	October 3 (Sat.) PM	Orientation at Tokyo Satellite
	October 5 (Mon.)	Orientation at Ishikawa Campus
	October 6 (Tue.)	No Class Day
	October 7 (Wed.) - December 2 (Wed.) **NOTE****	Term 2-1
	December 3 (Thu.)	No Class Day
	December 4 (Fri.) - February 8 (Mon.) **NOTE*****	Term 2-2
	December 24 (Thu.)	Degree Conferment Ceremony
	December 25 (Fri.) - January 4 (Mon.)	Winter Break
	December 29 (Tue.) - January 3 (Sun.)	School Office Closed (Winter Break)
	February 9 (Tue.) - March 31 (Thu.)	Winter Intensive
	March 24 (Thu.)	Degree Conferment Ceremony
	NOTE October 7 follws the MONDAY schedule.** **NOTE*** December 4 follows the WEDNESDAY shcedule.**	

Period for Registration and Change of Courses at Ishikawa Campus

Terms	Period for Rregistration and Course Change
Term 1-1	April 8 (Wed.) - April 21 (Tue.)
Term 1-2	June 10 (Wed.) - June 23 (Tue.)
Term 2-1	October 7 (Wed.) - October 20 (Tue.)
Term 2-2	December 4 (Fri.) - December 17 (Thu.)

The terms at Tokyo Satellite

April - June: Term I
July - September: Term II
October - December: Term III
January - March: Term IV

Check the web <http://www.jaist.ac.jp/satellite/sate/facility/> for the Tokyo Satellite operating hours since it occasionally varies.

Period for Registration and Change of Courses at Tokyo Satellite

Terms	Period for Rregistration and Course Change
Term I	April 8 (Wed.) - April 21 (Tue.)
	NOTE: April 8 (Wed.) - April 14 (Tue.) for courses begin in April
Term II	June 10 (Wed.) - June 23 (Tue.)
Term III	October 7 (Wed.) - October 20 (Tue.)
	NOTE: October 7 (Wed.) - October 13 (Tue.) for courses begin in October
Term IV	December 4 (Fri.) - December 17 (Thu.)

III. Study outline

1 Campus

JAIST's campus is in Nomi City, Ishikawa Prefecture. Courses for Working Professionals are offered at Tokyo Satellite (Minato-ku, Tokyo).

2 Schools and programs

JAIST includes the School of Knowledge Science (KS school), the School of Information Science (IS school), and the School of Materials Science (MS school), each of which has a doctoral program divided into an initial two-year program and a subsequent three-year program. The initial two-year program is called the master's program and the subsequent three-year program is called the doctoral program.

3 Academic calendar

JAIST academic calendar shows the dates of classes, vacations, institute-wide activities, course registration periods, and so on. Students must check the academic calendar which is displayed on the notice board next to the automatic certificate issuing machine and is published on JAIST's website (Education & Student Life: School Information and Academic Procedures → Academic Calendar).

4 Semesters and class periods

Semesters and class terms/periods at JAIST are shown in the Table 1 bellow. Each class is 90 minute long, and there will be as a general rule 15 classes for a 2-credit course. Refer to the syllabus for details of each course. One credit (in a 2-credit course) is awarded for the study amounts of 45 hours in self-study periods in addition to class periods (for Seminar and Research, one credit is awarded for the study amounts in accordance with the necessary workload for appropriate results as defined by the supervisor). Students are expected to plan their coursework and keep their study record, accordingly using a study/plan record under the guidance of their supervisor so that they can have sufficient time for their efficient academic work toward a degree acquisition.

At the Ishikawa Campus, 2 classes per week are held for each course, with the exception of intensive courses. The KS/IS/MS school courses are held in the mornings (1st and 2nd periods), with the 3rd period used as the office hour for the class in the 1st period of the day (this is a time for students to ask questions or discuss matters with the class instructor, and can be used for exercises, exams, and so on as well). The afternoon (4th and 5th periods) is used for classes of the Institute of General Education (IGE) courses.

At the Tokyo Satellite, classes are in the evenings on weekdays and in the weekends (including public holidays) for each course and as a rule office hours are not provided.

The class schedule can be checked on each school's page. The class schedule of the courses with the assigned lecture rooms will be displayed on the notice board next to the automatic certificate issuing machine and be able to be checked on JAIST website (Education & Student Life: School Information and Academic Procedures → Class Schedule) before the start of classes each term. Note that the class information for the KS school courses held at the Tokyo Satellite will be displayed outside the lecture rooms.

Location	Class Terms	Class Periods
Ishikawa	First Semester: Term 1-1, Term 1-2 (8 weeks each) Summer Intensive (August, September) Second Semester: Term 2-1, Term 2-2 (8 weeks each) Winter Intensive (February, March)	1st Period 9:20 - 10:50 2nd Period 11:00 - 12:30 3rd Period 13:30 - 15:00 4th Period 15:10 - 16:40 5th Period 16:50 - 18:20 6th Period 18:30 - 20:00 (Tokyo only) 7th Period 20:10 - 21:40 (Tokyo only)
Tokyo	First Semester: Term I (classes starting in April to June) Term II (classes starting in July to September) Second Semester: Term III (classes starting in October to December) Term IV (classes starting in January to March)	

Table 1: Semesters and class periods

5 Class structure

5.1 Courses in the KS/IS/MS schools

The KS/IS/MS school courses include the following courses; the Introductory courses (K1xx /I1xx /M1xx) that aim at providing a selected education at the post-graduate level mainly for students who have come into the JAIST from different majors, the Basic courses (K2xx /I2xx /M2xx) that aim at providing a thorough grasp of the basic concepts and methodologies, the Technical courses (K4xx /I4xx /M4xx) that aim at imparting specialist knowledge, and the Advanced courses (K6xx /I6xx /M6xx) that target mainly at students in the doctoral program. JAIST requires students to obtain credits accordingly so as to prevent from focusing on one specific area of study but to gain deeper knowledge from a wide range of research areas.

In addition, at the Ishikawa Campus some courses are offered twice a year, once in English and once in Japanese. Courses for Working Professionals at Tokyo Satellite are offered for specialist education aimed at professionals already at the forefront of research or business.

Please note that the courses offered in English are shown in the class schedules and syllabi with “E” after their course number (KxxxE/IxxxE/MxxxE).

5.2 Courses in the Institute of General Education (IGE)

Courses in the IGE are designed to educate people to be able to make full use of their leadership abilities on the international stage, with a wide, birds-eye view of the field. These courses are offered in the following three groups: Liberal Arts courses, to provide a high level of sophistication, high ethical standards, and an understanding of diverse cultures; Communication courses, to improve communication skills, including language abilities; and Career-Enhancing courses, aimed at positioning students’ specializations as a part of society. Please note that courses in the IGE are not offered at Tokyo Satellite.

IV. Matters related to tuition fees and enrollment

1 Tuition fees

Tuition fees are collected separately for the full amount for each semester (first semester: April 1st - September 30th, second semester: October 1st - March 31st), and as a rule are to be paid by bank transfer (see details in *HANDBOOK for Students*). Please note that if the tuition fees are revised while in school, the new fees will be applied upon the revision.

2 Leaves of absence

When students are not able to progress in their study for more than 2 consecutive months due to illness or other special reasons, they may apply for a leave of absence. The maximum period of leave in total for each of the programs, the master's and the doctoral, is 12 months. Please note that as the leave of absence is not counted in the total period required to complete a degree, study progression including course registration and research mentoring will not be recognized during the leave of absence, but there are no restrictions on use of the JAIST library or intra-school email.

The first of each month shall be the start date of a leave of absence, and it will not be permitted midway through a month. Students applying for a leave of absence must collect an Application for Leave of Absence from the Educational Service Section (hereafter, Kyoumu) and get approval from the dean of their school and from their supervisor, and submit the application to the president (via Kyoumu) with a doctor's statement if leave of absence is due to bad health no later than one month before the desired start of the leave of absence.

Please note that if the tuition payment is not completed before the desired leave of absence start date, the application will not be accepted.

In addition, if students wish to have a leave of absence partway through either semester, and they submit an application by April 10th (for the first semester) or October 10th (for the second semester), tuition will not be charged for the leave of absence. If the application is made after these dates, the full amount of tuition must be paid before the application is accepted. Check details of tuition fee payment during leaves of absence on the JAIST website (Education & Student Life: School Information and Academic Procedures → Absence and Withdrawal: Important Notes for Leave of Absence).

3 Returning

Students who wish to return to school before the end of their leave of absence should collect an Application for Returning at Kyoumu and submit it to the president (via Kyoumu) at least one month before their proposed month of returning. Students must promptly report their return to the president (via Kyoumu) by submitting a Notification of Returning available at Kyoumu to Kyoumu. Returning status starts on the first day of the month.

4 Withdrawal

A date for withdrawal shall be the last day of the month, and withdrawal halfway through the month is not permitted. Students who wish to withdraw must collect an Application for Withdrawal from Kyoumu and obtain comments from their supervisor, second supervisor and advisor for Minor Research Project/Internship and approval from the dean of their school, and submit the application to the president (via Kyoumu) no later than one month before the proposed start of the withdrawal.

Regardless of the date of withdrawal, if the tuition and other fee payments required by JAIST are not completed, the application will not be accepted.

5 Disenrollment (loss of student status)

Students falling under any of the following categories will result in the loss of student status:

(1) Those who have remained enrolled beyond the permitted maximum periods (4 years for the master's program, 6 years for the doctoral program)
*Students wishing to withdraw must complete the withdrawal procedures.

(2) Those whose leave of absence exceeds the period specified in Paragraph 4, Article 27, of the JAIST School Regulations (2 years).

(3) Those who have not paid their admission fee by the specified date and fall into one of the categories below:
- Students who have not been granted an entrance fee reduction or deferment.
- Students who have not been granted a half entrance fee reduction or deferment.
- Students whose entrance fee reduction or deferment has been revoked.

(4) Those who have neglected to pay their tuition fees and have not paid even following demands.

Note that if those who fall under either (3) or (4) have credits earned during the period in which the tuition was unpaid, the credits will also be cancelled.

6 Transferring between schools within JAIST

The times when students may transfer from the one school they are currently enrolled in to another are the beginning of April and of October. Students wishing to transfer to another school in April must contact Kyoumu by the end of January, and those wishing to do so in October, by the end of July. The materials to submit and the selection method will be presented to applicants.

7 Supplemental student status

Doctoral students may be allowed to keep student status after completed all of the academic requirements for their degree except their dissertation (K601, I601, M601) for a maximum period of 2 years, if the dean approves that the student will be ready to apply with the help of necessary research guidance from the supervisor for a degree conferment within 2 years. Duration of student status cannot be more than 6 years in total including the period spent in the doctoral program and this additional period. Supplemental student status can start only on April 1, July 1, October 1 or January 1. It cannot start subsequently right after leave of absence. Students wishing to get this supplemental status must contact Kyoumu at least one month before the proposed starting day of the status.This status does not allow students to conduct any academic work on campus, and thus, JAIST does not sponsor students to issue/extend/renew their student visa for the period.

8 Name changes

If students have changed their name, they will need to submit evidential documents attesting the change (e.g. a new resident's registration) and a Notification of Change of Name to the president (via Kyoumu). All certificates and documents issued by JAIST following acceptance of the notification will be with their new name. Certificates will be issued only with the name registered in JAIST records.

V. Educational system

JAIST provides a detailed, unique educational system that adjusts to students' ambitions, experiences, and abilities, with the goal of helping each student realize their career targets.

1 Educational programs

We offer five different educational programs to choose for each individual's career goals. Students will choose one of the educational programs below and take courses accordingly. However, students who take courses for Working Professionals in the master's program will be in the M program and those in the doctoral will be in the 3D. Check the each school page for the treatment of selection periods and degree completion requirements for each educational program.

1.1 Types of educational programs

(1) SD program (master's program, doctoral program)

This educational program is designed to identify students with top-level abilities at an early stage and to train scientists who can tackle new research challenges and open up new fields from a global perspective through a consistent doctoral education. Only those who have been admitted through the entrance examination for scholarship students for the SD program can take this program.

The SD program students are given guidance by faculty groups organized by specialist area, and aim to complete the master's program in 1.5 years and the doctoral program in 2.5 years, completing the entire program in 4 years. They may be recommended to change to another educational program if their grades are suffering.

(2) 5D program (master's program, doctoral program)

This educational program provides a consistent five-year doctoral education through the master's program and the doctoral program.

(3) 3D program (doctoral program)

This educational program provides a three-year doctoral education in the doctoral program.

Points common to both the 5D and 3D programs (only for Ishikawa Campus students):

Doctoral students must choose one of two career tracks in order to provide themselves with opportunities to consider their future desired careers. The tracks are; type S, for those who wish to become creative scientists who can plan and implement advanced research at education and research institutes, or to become university professors; and type E, for those who wish to become advanced specialist engineers who can lead and manage the latest research and development at companies.. See the each school page for the selection timing and other details. Students in any programs have equal opportunities for the Grant System for Off-campus Activity (see *HANDBOOK for Students* for details) or for taking courses. JAIST recommends that students in both 5D and 3D programs take E413 Scientific Discussions 2 and B411 Advanced Project Management, participate in research activities at other research institutes in Japan or overseas, and try out long-term advanced internships in companies in accordance with their choice of career paths.

(4) M program (master's program)

This educational program is designed to provide a master's-level education for 2 years in the master's program to train practical specialist engineers who can play a leading role in companies or other areas based on specialist knowledge and technology.

(5) Mα program (master's program)

This educational program is designed to provide a master's-level education in the same way as the M program for between 2 and 3 years, aimed at those students who wish to learn properly from the basics or who have changed their major since obtaining their bachelor's degree. Enrollments longer than 2 years in this program will qualify for reductions in tuition fees.

However, the reduction period is limited to a maximum of one year.

1.2 Changing educational programs

It is possible to change to another educational program if you need to for approved educational reasons following the decision. However, change will not be permitted in the following circumstances.

- Changing from another educational program to the SD program
- Changing from another educational program to the Mα program
- Changing from the Mα program to the M program (however, the Mα program study period may be shortened to 2 years)

Note that the program will be changed as soon as it is recognized that completing the SD program or the 5D program cannot be done in the allotted time including following cases:

-when a student does not submit a research proposal by the designated submission due date in the master's program

-when a student does not submit a dissertation outline by the designated submission due date in the doctoral program

Changing the programs will disqualify the SD/5D scholarship at the same time.

2 Specialized courses

We provide the specialized courses for our curriculum in Table 2, classified by content. Students will be granted a certificate of completion if they complete all the necessary courses for the program completion.

		Specialized Courses	
		School of Knowledge Science	School of Information Science
Ishikawa Campus Students	Master's Program		-Highly-Dependable and Smart Embedded Systems Track -Information Security Track -Fostering ICT Global Leader Track
	Doctoral program		-Fostering ICT Global Leader Track
Working Professional Students	Master's Program	-Innovation Management of Service and Technology Course >Management of Technology Field >Management of Service Field >Medical Service Science Field	-Innovation Management of Service and Technology Course >Management of Service Field -Advanced Information Technologies Science Course
	Doctoral program	-Advanced Knowledge Science Course	-Advanced Information Science Course -Advanced Software Engineering Course

Table 2: Specialized courses

The Center for Nano Materials and Technology (CNMT) at the Ishikawa Campus offers the Nano Materials Technology Program. See the program page for details at the end of this booklet.

VI. Matters related to taking courses

1 Degree completion requirements

In addition to the requirements shown below, requirements for credits obtained and courses taken are set in each school. See the school page for details. Note that students are responsible for reviewing and checking to meet all the requirements for completion.

1.1 Degree completion requirements for the master's program

(1) In principle, students are required to spend a minimum of 2 years in the master's program. It may be approved to complete in less than 2 years in accordance with Article 36 of the JAIST School Regulations, however, if a prior application for fast-track degree completion is made, granted and the plan for a degree completion in a shorter period (1 year minimum) is carried out with the academic grades deemed sufficiently high by faculty. Information on fast-track degree completion will be provided at enrollment.

(2) As JAIST Course Regulations stipulate, students are required to obtain a minimum of 30 course credits. IS students who are in the Fostering ICT Global Leader Track, are required to obtain 32 or more credits.

(3) Students must submit a master's thesis or research project report after sufficient research supervision and guidance, and pass the defense and the final examination.
IS students who are in the Fostering ICT Global Leader Track may be required to take a designated exam (Ph.D. qualifying examination) in place of a master's thesis or research project report.

1.1.2 Requirements for progression within JAIST to the doctoral program for 5D program students

5D program students who wish to progress to the doctoral program are required to meet the requirements set by each school, including taking KS/IS/MS school courses and IGE courses and to have sufficient English proficiency in addition to meeting the degree completion requirements in the section 1.1. Check the page for each school for details.

1.2 Degree completion requirements for the doctoral program

(1) In principle, students are required to spend a minimum of 5 years in graduate school (including the time spent in the master's program). It may be approved to complete in less than 5 years in accordance with Article 36 of the JAIST School Regulations, however, if a prior application is made by a specified time, granted and the plan for a degree completion in a shorter period (3 years minimum including the time spent in the master's program) is carried out with the academic grades deemed sufficiently high by faculty.. See the section VIII.2.1 for details on fast-track degree completion.

(2) A minimum of 20 credits are to be obtained from KS/IS/MS school courses.

(3) Students must submit a doctoral dissertation and pass the defense and the final examination after sufficient research supervision and guidance.

1.3 Handling of courses in the Institute of General Education

Credits from the IGE courses except for E1xx and J1xx can be included in the degree completion requirements for the master's program.
Note that E413 Scientific Discussions 2 and B411 Advanced Project Management in the IGE courses can be counted for the degree completion requirements as each school's Technical course without any area assigned for both the master's and the doctoral programs.

2 Course-related procedures

2.1 The Gakumu system (Academic Affairs System) and lecture syllabi

2.1.1 The Gakumu system (Academic Affairs System)

JAIST uses the Gakumu system for all procedures related to course registration, grade checking, and so on. Ensure that you fully understand how to use the system, and have no problems with registration or other actions. If there are any points you are unclear about, check with the manual

first, and then ask Kyoumu.
Check how to login the Gakumu system:
<JAIST top page → Education & Student Life: School Information and Academic Procedures → Gakumu System (Academic Affairs System) >
(https://gakumu.jaist.ac.jp/hcampus/) (On-Campus Use Only)
Note that User ID is assigned to students at enrollment. Password is the same as one for JAIST Mail.

2.1.2 Lecture syllabi

Lecture syllabi can be viewed on the Gakumu system and on the JAIST website (JAIST top page → Education & Student Life: School Information and Academic Procedures → Syllabi). Copies of the syllabus booklet are not available.

2.2 Study Plan/Record and course registration

2.2.1 Study Plan/Record

A Study Plan/Record refers the plans and records of student's academic work from enrollment to completion. Students are expected to record the details of supervision from their supervisor for later reviewing their academic work. The entries should be checked carefully and be kept updated. Note that the Study Plan/Record is managed entirely through the Gakumu System. See the section "Study Plan/Record" in *HANDBOOK for Students*.

2.2.2 Course registration

Refer to the class schedule and the syllabus to make sure your course registration is properly planned. JAIST does not permit double registration of two courses that have overlapping times, even if only partially, nor will allow repeating courses for credits you have already obtained.
Please note that the Ishikawa Campus students must take courses held at the Ishikawa Campus, and the Working Professional students must take courses held at the Tokyo Satellite. The non-credit courses like credited ones must be registered in order to attend.
Course registration should be done through the website (Gakumu System). Check the system manual how to register for courses online (JAIST top page → Education & Student Life: School Information and Academic Procedures → Gakumu System (Academic Affairs System) →student manual → Course Registration／Grades).

(1) Course registration for KS/IS/MS school courses
Students must plan their coursework after a consultation with their supervisor. The course registration must be done online in the Gakumu system during the designated period for each term. It is the student's responsibility to check if all the courses they wish to take are successfully registered. Adding, changing, or deleting courses can be done as many times as you wish only during the designated registration period. Check the course registration period for each term on the academic calendar. Students will be notified regarding intensive courses and other irregular courses once the schedules have been set.
(2) Course registration for courses in the IGE
The registration for the IGE courses should be done in the same way as those for the KS/IS/MS school courses. Note that the Japanese language courses in the Communication courses are offered only to international students. If it is determined that inappropriate course registrations have been made, the course registration (and the earned credits) will be removed even if the course has already been completed.

2.3 Repeating course in the same year

Repeating courses in the same academic year is permitted for students who have spent longer than the standard enrollment period, for both the courses for each school and IGE courses. The following conditions apply for students who have not yet exceeded the standard enrollment period.
(1) KS/IS/MS school courses:
Permitted only when the school approves of an application from students.

(2) IGE courses:

Permitted only when the school approves of an application from students. There are no restrictions for repeating non-credit courses.

Please note that for both (1) and (2), applications for repeating courses will require the seal of approval from both course instructors of the first and second time if the students had received "0" score for the course the first time.

Students wishing to repeat courses must submit an Application for Repeating Courses (JAIST top page→ Education & Student Life: School Information and Academic Procedures → Course Registration (On-campus use only)) within one week of the start of the course registration period for the term when the course they wish to repeat will be held, and submit it to Kyoumu. Course registration for the course to repeat will be done by Kyoumu. Please note that there is no need to apply to repeat non-credit courses. Students wishing to do so can register in the Gakumu system during the course registration period. Note that taking a course with the same course number but in a different language (e.g. K211 and K211E) is considered repeating a course and requires submission of an application form by the registration deadline.

2.4 Taking courses from other schools (Major Crossovers)

Credits obtained through a Major Crossover up to 4 credits can be included in the number of credits required for a degree completion.

Note that students in the KS school cannot take I112 Computer Systems in the IS school and students in the IS cannot take K119 Introduction to Computer Programming in the KS.

Students who wish to take a course from another school should submit an Application for Taking Courses from Other Schools (JAIST top page → Education & Student Life: School Information and Academic Procedures → Course Registration (On-campus use only)) within one week of the start of the course registration period for the semester when the course they wish to take will be offered, and submit it to Kyoumu after obtaining approval of their supervisor. Course registration will be done by Kyoumu.

The Ishikawa Campus students are able to count 2 credits (1 course) from the completed courses of any of the Basic, Technical, or Advanced courses through a Major Crossover in the specified credits for the Global Human Resource Development Program. For the master's program students, 1 course (2 credits) from the finished Major Crossover courses will be recognized as one (2 credits) of the requirement of "at least 8 credits (4 courses) from IGE courses". For the doctoral program students, one course (2 credits) of the finished Major Crossover courses will be recognized as one course (1 department, 2 credits)of the requirement of "at least 8 credits (4 courses, 3 departments) from IGE courses".

3 Global Human Resource Development Program

In order to educate students to be able to make full use of their leadership abilities on the international stage, with a wide, birds-eye view, students are encouraged to take courses in the IGE. A certificate of completion will be granted to those who obtain the specified number of credits.

3.1 Master's program

The Global Human Resource Development Program Completion Certificate (master's program) will be awarded on completion of the master's program to those who have obtained at least 8 credits (4 courses) from the Institute of General Education and who have completed E211 Intermediate Technical Communications or higher level courses or are deemed to have the equivalent ability.

3.2 Doctoral program

The Global Human Resource Development Program Completion Certificate (doctoral program) will be awarded on completion of the doctoral program to those who have obtained credits indicated below. However, courses in the IGE taken (except for E413 and B411) during the master's program by those who enrolled in the master's program at JAIST will need to be retaken because the credits obtained before entering the doctoral program are not recognized.

IGE courses: At least 8 credits (4 courses) from all 3 departments, and meeting the following requirements.

- At least 4 credits (2 courses) from Liberal Arts Education Department
- At least 2 credits (1 course) from Global Communication Education Department
- At least 2 credits (1 course) from Career Education Department

4 Examinations, grade assessments, etc.

(1) A final exam will generally be given to complete a course. When exams are difficult to be implemented, research reports or similar tasks will be assigned instead.
(2) Grades will be assessed by the result of a final examination and student's achievement. Grades are a percentage point scale based on the view point, method, and criteria listed in the syllabus, with 60% being the passing score. Courses which are difficult to score as percentages will be either "Pass" or "Fail." The specified credits will be awarded to those who have been given passing grades.
(3) Credits that have already been obtained cannot be deleted or changed.
(4) Grades can be checked using the Gakumu System, starting around 2 weeks following each term for the Ishikawa Campus students, and once the notification for the grade reports has been received from Kyoumu for the Working Professional students. Please note that any questions regarding the grade assessments should be directed to Kyoumu.
(5) If there are any improprieties in taking classes or examinations, all credits for that semester will be withdrawn.
(6) JAIST may calculate an academic performance index based on (1) and (2) so that it can be used for certain procedures JAIST approves necessary.

5 Course evaluations

To help improve class quality, JAIST asks that students to provide an evaluation for each course through a questionnaire midterm and the following end of courses. The results of the midterm questionnaire will be reported to the course instructors to help improve the second half of the courses. The results from the end-of-term questionnaire will be notified to the instructors after the submission of grade reports.

6 Recognition of credits obtained prior to admission

Students who wish to have the credits they obtained before admission recognized must submit an application form available on the JAIST website (JAIST top page →Education & Student Life: School Information and Academic Procedures → Course Registration → Course Registration (On-Campus Use Only)) to the president (via Kyoumu) after obtaining the approval of their supervisor within 2 weeks of enrollment. If students apply for credit transfer for courses taken at other graduate schools, the official transcript and a syllabus that show the details of the courses must also be submitted.

The assessment for courses that are recognized will be as "Transferred." By taking the courses at JAIST, the "transferred" status will be renewed by a score as percentages. These recognized courses can be included in the degree completion requirements. Once recognized, it cannot be changed. The following are the details:

(1) Credits obtained at other graduate institutes

The maximum number of credits that can be allowed to transfer is 8 credits which will be equivalent to KS/IS/MS school courses taken at JAIST after evaluation by the faculty. No credits will be recognized for the Introductory courses for the doctoral program.

(2) Credits obtained in the master's program at JAIST

You can only transfer credits exceeding 10 credits you have obtained. The maximum number of transferable credits is 8 which maybe recognized as the Advanced courses. Note that credits from the Introductory courses, the Seminars (major research project) and Research (minor research project) are not transferable. E.g. If you have obtained 16 credits (except those of the Introductory courses, the seminar and the research), you may transfer 6 credits. The IS school has its own requirements, which should be checked on its page.

(3) Credits obtained as a JAIST non-degree seeking student

All obtained credits will be recognized (except for those of the Introductory for the doctoral program).

(4) Other

Inquire at Kyoumu about transferring credits for transfer students or readmitted students.

7 Taking courses at other graduate institutes through the course interchange agreement

To promote exchanges and cooperation with the graduate institutes listed in Table 3 below and to enhance our educational content, JAIST operates course interchange whereby students can take courses at other graduate institutes. After checking the syllabi of our Partner Institutes, students who wish to take courses there should discuss this with their supervisor and follow the procedures (see (3) below). When applying, they should check the class schedule so that they only select courses they are surely able to attend.

(1) Application fee, admission fee, tuition fee

Students will be classified as “non-degree seeking students from a partner institute” and thus will not have to pay any application fees, admission fees, or tuition fees, except the School of Graduate Studies at the Open University of Japan will charge the tuition fees.

(2) Courses and credits

Courses that can be taken at Partner Institutes (except for the Open University of Japan) must be the ones that are effective for research and that do not cover topics already provided by JAIST. See the table below. During their period of enrollment at JAIST, students can take a maximum of 10 credits 5 courses including the recognized credits obtained previously at other graduate institute.

Permission for taking courses, whether the courses taken will be counted as JAIST courses and whether they will be included for the degree completion requirements at JAIST will be determined at a faculty meeting on student’s request. Please note that credits for courses obtained at the Open University of Japan will not be recognized as course credits for each school. Note that the IS school does not assign an area to the credits obtained through this agreement.

(3) Application procedures

Students wishing to take courses at a Partner Institute should consult with their supervisor and then carry out the procedures within the specified period once permission is granted. The class schedule, syllabi, and procedures for Partner Institutes will be notified as appropriate.

	Partner Institutes	Courses available
For Master’s Program Students	Graduate School of Natural Science and Technology, Kanazawa University*	Courses taught by full-time faculty members of the Partner Institutes (Laboratory work, practices, exercises, research projects are not included.)
	Graduate School of Engineering, Kanazawa Institute of Technology*	
	Graduate School of Arts and Sciences, the Open University of Japan	All the graduate school courses
For IS students only	School of Multidisciplinary Sciences, the Graduate University for Advanced Studies	Courses announced by Kyoumu.
	Graduate School of Global Information and Telecommunication Studies, Waseda University	

Table 3: Partner Institutes

*Students are not allowed to take courses at the partner institutes for the first half year after entering JAIST because courses at JAIST are given priority. The IS school students must complete a minimum of 2 IS courses (4 credits) also.

VII. Matters related to research supervision

1 Laboratory assignment

1.1 Master's program

All students are provisionally assigned to a laboratory when they enter JAIST. After inquiry about a laboratory of their choice, the final assignment will be made 3 months after enrollment for the IS and MS students, and 4 months for the KS students. Students will be notified regarding applications for final assignment. Please note that the MS school will not make final assignments unless students have obtained the specified number of credits. Check the school's page for details.

1.2 Doctoral program

Students in the 5D and SD programs will be assigned to the laboratory which they were assigned in their master's program. For the 3D program students, consultation with their expected supervisor prior to admission to the doctoral program is necessary. Assignments to a laboratory of their choice will be made upon enrollment .

1.3 Changing laboratories

If students wish to change their assigned laboratory to another one for any reason, they must contact Kyoumu.

2 Study and research supervision

Since its founding, JAIST has used a supervisory system whereby, in addition to a research theme related to their major field of study (Major Research Project), students are required to take on a secondary research theme to give them some fundamental concepts, knowledge, and abilities from different research fields (Minor Research Project).

In addition, in the doctoral program, students can choose to study in other educational or research institutes in Japan or overseas as a part of a major research project, and undertake internships in companies in place of a minor research project, helping them create a career that allows their specialist skills to help society.

2.1 Major research project

A major research project is called Seminar A (Master's Thesis for 8 credits or Research Project for 2 credits) and a required course for the master's program. It is called Advanced Seminar B (Doctoral Dissertation for 6 credits) in the doctoral program. For the IS master's students in the Fostering ICT Global Leader Program, Seminar A (Survey for Doctoral Research Plan for 2 credits) is a required course in place of Seminar A. Check the school page for details.

Once students decide a research theme in their research area, they must submit a research proposal. A start of a research period will be at the point when a research proposal has been accepted after vetting by 3 advisors. However, the IS school has different conditions for a start of a research project, which should be checked on the school's page. Please note that if a submission of a research proposal for the master's program is delayed, its completion date will also be delayed. Check the conditions for starting a major research project on the page of each school. Students must also obtain necessary forms from JAIST's website (Education & Student Life: School Information and Academic Procedures → Degree Requirements, Timeline and Procedures).

2.2 Minor research project

A minor research project is called Research A (2 credits) in the master's program and Advanced Research B1 (Minor Research Project for 4 credits) in the doctoral program, which is a required course. A research theme for a minor research project for master's students should be one from outside of their research area so as to learn the fundamental concepts, knowledge, abilities, etc. outside of their field. For doctoral students, a research theme should be chosen from a different research area, or a different topic from the same research area of the major research project. Please note that the IS doctoral students must choose a topic from a different field if the topic is from the same as their research area.

Check the conditions for starting a minor research project on the page of each school. Students

must also obtain necessary documents from JAIST's website (Education & Student Life: School Information and Academic Procedures → Minor Research Project).

2.3 Internships for doctoral program

An internship is a 4 credit worth course (Advanced Research B2) in the doctoral program which can be substituted for a minor research project by choice. Doctoral students select either a minor research project or an internship within a year of admission. Generally, internships include high-level research and study at a company for more than three months. See each school page for details. For the doctoral Working Professional students Advanced Research B1 (Minor Research Project) is compulsory and Advanced Research B2 (Internship) cannot be selected.

3 Multiple supervisory system

JAIST has a multiple supervisory system in which one student has 3 faculty members assigned so that students will receive overall supervision and advice for both academic work and daily life in general with various issues students might face. JAIST faculty members are here to help students to develop characteristics to suit the ideal person JAIST strives to educate.

The system uses a supervisor, a second supervisor, and an advisor for Minor Research Project (or an advisor for Internship in the doctoral program). Each faculty member plays the following roles.

(1) Supervisor
- (a) Plays the main role in supervising the students' academic work and research.
- (b) Provides supervision for the research topic (Major Research Project) related to students' research field, and for writing a thesis/dissertation.
- (c) Provides guidance for students' student life, career path and formation.
- (d) Determines how to solve various problems students may face through links with a second supervisor and other related parties.

(2) Second supervisor
- (a) Provides guidance for students' academic work and research and advice to students from a different perspective to a supervisor.
- (b) Provides guidance and advice for students' student life, career path and formation from a different perspective to a supervisor.
- (c) Works to solve various problems students may face through links with a supervisor as required.

(3) Advisor for Minor Research Project (Advisor for Internship)
- (a) In principle, provides supervision for a secondary research topic (Minor Research Project) or an internship as a faculty member from outside students' research field.
- (b) Provides advice for various academic issues students may have from a different perspective to a supervisor and a second supervisor (including liaising with the internship location).

4 Research supervision at other schools or other graduate institutes

(1) Major Research Project supervision at other schools or other graduate institutions

Under supervision of their supervisors, students are free to do a part of their major research project at another school within JAIST or at another graduate institute elsewhere.

(2) Minor Research Project supervision at other schools or other graduate institutes

Students may work on their minor research project at another graduate institute outside JAIST or another school at JAIST (including the Institute of General Education; the KS school will specify which faculty members from the IGE may work on the project with) under supervision of a faculty from their school when the dean of the school recognizes that there will be a synergistic effect for human development in the student's research field within the school. For the KS and IS students, if they decide to work on their minor research at another school in JAIST, they can have a faculty member whom they work with as their advisor for Minor Research Project.

(3) Research period

The research period at other schools or other graduate institutes shall be no longer than 1

year for the master's program and 18 months for the doctoral program.

(4) Procedures

Students who wish to receive research supervision at another graduate institute outside JAIST must submit a form for Entrustment of Research Guidance outside JAIST at least 2 months prior to the start of research to the vice president via Kyoumu through their supervisor. There are no special procedures required for such entrustment of research supervision in other schools within JAIST.

VIII. Matters related to conferment of degree

The conferment of degree is done on dates specified by JAIST in the months of March, June, September, and December.

1 Degree defense for the master's program

The procedures related to a defense and a final examination are laid out in the "Degree Regulations" and in the "Bylaws Related to the Defense for Granting the Master's Degree," and other arrangements.

1.1 Application for conferment of degree

Students who are expected to meet the degree completion requirements (expect for Seminar A) for the master's program and who wish to apply for a degree conferment must read *Application Guide for the Award of Master's Degrees*, get the supervisor's approval and submit an Application for Conferment of Degree and the necessary documents to the president (via Kyoumu). The IS students in the Highly-Dependable and Smart Embedded Systems Track must have completed all the required courses except for Seminar A and one from the Practical Courses, and the rest of the IS students must have completed all except for Seminar A before applying for degree conferment. The deadline for applying for a degree will be 2 months before the scheduled completion date, or 3 months for those wishing to graduate in September (the date will be specified by JAIST).

1.2 Submission of master's thesis or research project

Degree applicants must submit their master's thesis or research project report by the date specified by JAIST to the president (via Kyoumu) after gaining the approval of their supervisor, and then distribute copies to the examination committee, including the supervisor. Please note that names of the examination committee will be announced accordingly along with the thesis presentation schedule.

1.3 Conferment of degree

Degree applicants will undergo a private thesis defense and final examination once they have publically presented their thesis. The decision of degree conferment will be made after a deliberation at a faculty meeting. The student number of successful candidates will be announced on the notice board next to the automatic certificate issuing machine (a list of the number of successful candidates will be sent by email to the Working Professional students).

2 Degree defense for the doctoral program

The procedures related to a defense and a final examination are laid out in the "Degree Regulations" and in the "Bylaws Related to the Defense for Granting the Doctoral Degree," and other arrangements.

2.1 Dissertation outline

A dissertation outline must be submitted to Kyoumu at least 6 months before an application for a degree after gaining the approval of all 3 advisors. The IS students must have obtained all required credits except for Advanced Seminar B before applying.
Students wishing for fast-track degree completion should first consult with their supervisor and set the earlier outline submission time. Then report to the dean of the school via their supervisor that they plan to apply for fast-track degree completion.

2.2 Preliminary defense

Students who have obtained all the required credits other than Advanced Seminar B must submit their request for a preliminary defense of the doctoral dissertation to the dean of the school (via Kyoumu) at least 3 months before their degree application, with the approval of their supervisor. The supervisor will carry out the procedures for holding the preliminary defense based on this request. The student must provide drafts of the degree dissertation to each prospective examination committee member 2 weeks before the preliminary defense meeting. Please note that

the prospective examination committee will be announced accordingly along with the date for the preliminary defense.

2.3 Degree application and conferment of degree

Those who pass the preliminary defense should carefully read *Application Guide for the Award of Doctoral Degrees* and, after obtaining approval of all 3 advisors, submit an Application for Conferment of Degree and the necessary documents to the president (via Kyoumu). Degree applicants will first present their work at a formal hearing (open to the public) and then be examined by the examination committee at which time they will provide a defense of the dissertation and have their final examination (not open to the public). Please note that the examination committee will be announced along with the date for the formal hearing.

The decision of degree conferment will be made after a deliberation at a faculty meeting. The student number of successful candidates will be announced on the notice board next to the automatic certificate issuing machine (a list of the number of successful candidates sent by email to the Working Professional students).

Please note that the successful candidates must check the necessary procedures in *Application Guide for the Award of Doctoral Degrees* and must ensure them done by the specified deadline.

IX. Systems in place

1 Extended study period for completion

If students whose study time at JAIST is limited by job conflicts or other issues and finds it difficult to complete the study within the standard enrollment period, they may be allowed to spend a certain additional amount of time to complete. Students who wish to extend their study period must check the JAIST website (Education & Student Life: Other Information → Fast-Track Degree Completion / Extended Study period for Completion) and apply before the designated deadline.

2 Progression within JAIST

Those students who complete a master's program at JAIST and wish to continue onto the doctoral program must check the Application Guide and apply for the Internal Entrance Examination.

3 Finding employments

(1) Guidance and supervision for finding employments and other career formation matters will be done at periods set by JAIST-wide and by each school.
(2) School recommendations will be made only for students who satisfy the recommendation standards set by the school. Check each school's page for details.

4 Teaching certificate

Check the details in the relevant pages with the Japanese-language version of *Degree Completion Guide 2015-2016*.

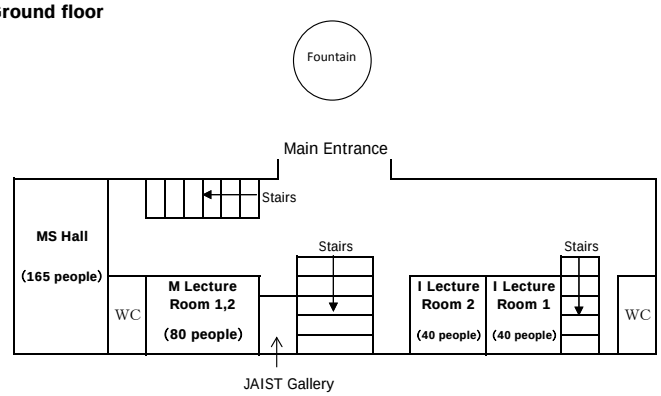
5 Study and training benefit plans

Check the details in the relevant pages with the Japanese-language version of *Degree Completion Guide 2015-2016*.

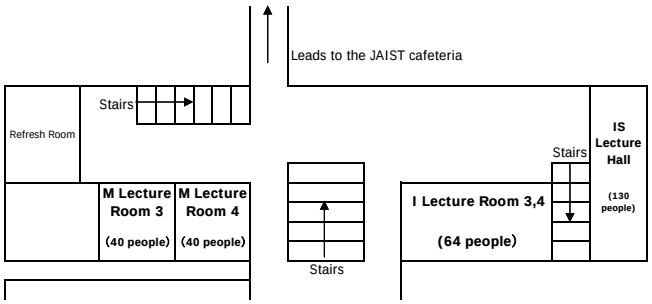
Lecture room map

○School of Information Science, School of Materials Science

Ground floor

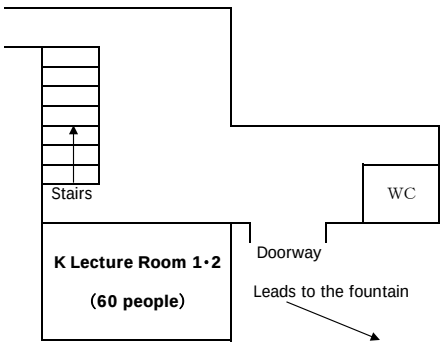


First floor

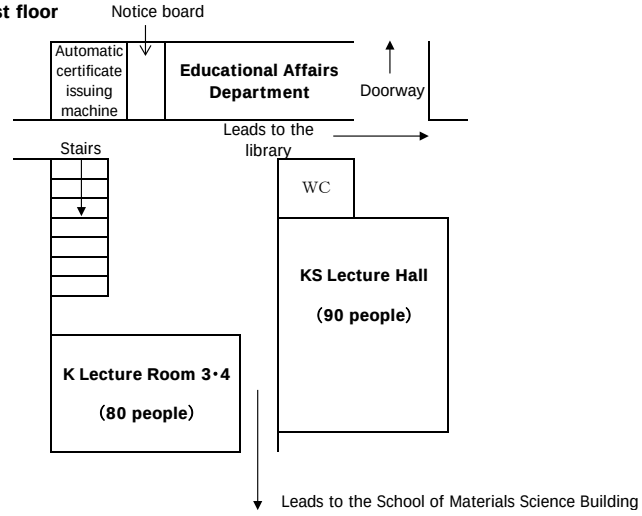


○School of Knowledge Science

Ground floor



First floor



Institute of General Education

Institute of General Education

1 Overview of the Institute of General Education

The Institute of General Education (IGE) consists of three Departments: Liberal Arts Education, Global Communication Education, and Career Education. It provides a broad range of subjects to cultivate sophistication and knowledge, greater ethical awareness, and excellent communication skills. It also aims to equip students with language competency, an understanding and receptiveness toward diverse cultures, and career education to assist graduates find positions in society based on their individual specialties and strengths.

Japan has become increasingly affected by the global environment. Many corporations now focus on overseas operations. The objectives of postgraduate education today should place great emphasis not only on the fostering of researchers in advanced science and engineers in highly specialized technology, but also on the development of individuals who can exercise leadership on the international scene and who are able to think from a variety of perspectives.

JAIST has established specialized facilities to adapt postgraduate education to the rapidly globalizing society. The Global Communication Center has strengthened students' international communication abilities, while the Career Support Center has supported doctoral students in playing an active role in a corporation in the future. Since its establishment, JAIST has also offered cross-departmental courses, mainly in the areas of advanced liberal arts. The IGE was established to integrate these centers into a single educational organization responsible for cultivating individuals who can play an important role in global society. Each of the three IGE departments aims to foster students' ability necessary to be successful internationally.

【Liberal Arts Education Department】

The Liberal Arts Education Department offers basic liberal arts education courses to cultivate individuals who will utilize their qualities that are essential for leadership, such as an understanding of mathematical reasoning, philosophical thinking, the global economy.

【Global Communication Education Department】

The Global Communication Education Department offers systematic training in language and communication skills essential for success in the international arena. Assistance is provided to all students to help them master skills in English for academic or specific purposes; international students are able to acquire academic and business communication skills in Japanese.

【Career Education Department】

The Career Education Department offers career education intended to provide opportunities for students to find positions in society that match their own area of expertise and to foster their ability to contribute to society based on their acquired knowledge and skills.

2 Staff

Director: KAWANISHI, Shungo (Professor)

[Liberal Arts Education Department]

Head: KAWANISHI, Shungo (Professor)
Associate Professor MIZUMOTO, Masaharu
Visiting Professor KUNIFUJI, Susumu
Visiting Professor KOBAYASHI, Akiko
Part-time Lecturer TAKEUCHI, Fumihide
Part-time Lecturer HIGASHIJIMA, Jin
Part-time Lecturer MIZUKOSHI, Shin
Part-time Lecturer HIRATA, Toru
Part-time Lecturer KAWAMURA, Takaya
Part-time Lecturer MERKLEJN, Iwona Regina

[Global Communication Education Department]

Head: KAWANISHI, Shungo (Professor)
Professor HOLDEN, William Riley
Professor HONDA, Hiroyuki
Research Lecturer Blake, John
Visiting Professor SHIBUYA, Yoshiho
Visiting Professor TSUJI, Toshihide

Associate Professor
TERRILLON, Jean-Christophe Georges
Research Lecturer
Ambassah, Nathanie Ochiengl
Research Lecturer
HINCHEY, Dubhgan Kyle-Arleas

[Career Education Department]

Head: KOHDA, Youji (Professor)
Visiting Professor TANAKA, Hiroshi
Part-time Lecturer HASHIZUME, Toru
Part-time Lecturer HORIGUCHI, Etsuko
Part-time Lecturer YAMAGUCHI, Michiyo
Part-time Lecturer TSUTSUI, Masako
Part-time Lecturer SERYO, Koichi
Part-time Lecturer YANAGISHITA, Kazuo
Part-time Lecturer MIURA, Susumu

3 Lecture schedule

Please see the class schedule page of each graduate school for the Institute of General Education class schedule.

4 Liberal Arts Education Department (Liveral arts courses)

The IGE offers courses intended to equip students with ability to think from a variety of perspectives, focusing on three abilities: mathematical understanding, philosophical thinking, and global consciousness.

L211 Logic and Mathematics will provide mathematical preparation necessary to students of all the graduate schools. L212 History and Philosophy of Science will develop students' ability to comprehend philosophical ways of thinking in the field of science. L214 A Methodology for Innovation Design will equip students with methods of creative problem solving in a global context necessary for students of any academic field.

L213 World Economics, L221 Ethical Issues in Science, L222 Introduction to Management of Technology and Intellectual Property Rights, L223 Media Theory and L224 Introduction to Science and Technology in Global Perspective are essential for advanced scientists and highly specialized engineers.

4.1 Course listing

Course Number	Course Title	Language *	Class Terms	Instructor(s)	Notes
Liberal Arts Courses I					
L211	Logic and Mathematics	J	1-1	Preining	
		E	2-1		
L212	History and Philosophy of Science	E	1-1	Mizumoto	
		J	2-1		
L214	A Methodology for Innovation Design	J	1-1	Kunifuji, etc.	
		E	2-1		
Liberal Arts Courses II					
L213	World Economics	J	September	Takeuchi	
		E	February		
L221	Ethical Issues in Science	J	September	Higashijima	
		E	February		
L222	Introduction to Management of Technology and Intellectual Property Rights	J	September	Hirata, Kobayashi	
		E	February	Kawamura, Kobayashi	
L223	Media Theory	E	September	Merklejn	
		J	February	Mizukoshi	
L224	Introduction to Science and Technology in Global Perspective	J	September	Ebitani, etc.	1 credit

***** "J" indicates that the course is offered in Japanese; "E" in English.

5 Global Communication Education Department (Communication courses)

Technical communication skills are essential for taking an active role in global society. To develop these skills, the Global Communication Education Department (GCED) offers Technical English Communication Education and Technical Japanese Communication Education Programs that systematically offer courses from basic to advanced levels and courses for intercultural understanding to complement the language education.

The Technical English Communication Education Program consists of 12 courses at 4 levels from Interaction Seminar to Advanced Technical Communication. The Technical Japanese Education Program provides international students with 8 courses at 4 levels from basic to advanced. The courses provide technical Japanese language skills for basic, scientific and technical, and business communications. Moreover, courses such as G211 Global Communication for Collaboration Building, G212 Writing and Presentation Skills in Japanese and G213 Japan Studies are offered to enhance global communication education.

In principle, students are required to take classes corresponding to their levels of language proficiency.

5.1 Communication courses (Technical Communication Education Program)

5.1.1 System of technical English communication courses

The Technical English Communication Education Program offers language skills courses at 4 levels: five courses at the interaction seminars and basic level aim to improve and enhance basic reading, writing, listening, and speaking skills. Six courses at the intermediate, advanced and scientific discussions levels aim to develop student's technical communication skills by offering training in critical thinking, academic and scientific reading and writing, technical presentations, and discussion in the context of science and technology.

Interaction Seminars: E011 Interaction Seminar 1, E021 Interaction Seminar 2

These courses aim to rebuild foundations of English language by reviewing basics of English grammar and basic skills for reading, writing, listening, and, speaking, thereby stimulating students' motivation to study English further.

Basic Technical Communication courses: E111 Academic Discussion and Debate, E112 Academic Writing and E113 Reading research Documents

These courses help students master essential reading, writing, listening, and speaking skills in the concrete contexts of research and education.

Intermediate Technical Communication courses: E211 Writing Research, E212 Presenting Research

These courses further develop technical communication competence in English by introducing students to scientific writing and technical presentation, and in the context of science and technology.

Advanced Technical Communication courses: E411 Writing Short Research Documents, E412 Writing Extended Research Documents

These courses aim to develop advanced technical communication skills in English for scientists and engineers, by enabling them to write, publish and orally present academic papers.

5.1.2 Course listing

Course Number	Course Title	Class Terms				Instructor(s)	Notes
E011	Interaction Seminar 1	1-1	1-2	2-1	2-2	Hinchey	Non-credit
E021	Interaction Seminar 2	1-1	1-2	2-1	2-2	Hinchey	Non-credit
E111	Basic Technical Communication 1	1-1		2-1		Holden	
E112	Basic Technical Communication 2		1-2		2-2	Holden	
E113	Basic Technical Communication 3	1-1	1-2	2-1	2-2	Blake	
E211	Intermediate Technical Communication 1	1-1	1-2	2-1	2-2	Ambassah	
E212	Intermediate Technical Communication 2	1-1	1-2	2-1	2-2	Holden	
E213	Scientific Discussions 1	1-1	.	2-1		Blake	
E411	Advanced Technical Communication 1	1-1		2-1		Ambassah	
E412	Advanced Technical Communication 2		1-2		2-2	Ambasah	
E413	Scientific Discussions 2		1-2		2-2	Blake	
E422	Seminar for Practical English						1 credit. Not offered this year.

Note 1: Depending on the number of registering students, some courses may be offered in more than one time slot in the same term.

5.1.3 The goal to be attained by learning technical communication in English

All students are expected to obtain a minimum TOEIC score of 600 by graduation. To that end, students whose TOEIC scores are under 500 are to take E011, E021, and students whose TOEIC scores are between 500 and 599 are supposed to take E111-113. A TOEIC score of 600 or more can be substituted as credits for one course from E211-413 toward earning a certificate from the Global Human Resource Development Program.

5.1.4 TOEIC IP tests

The Global Communication Education Department (GCED) periodically offers TOEIC IP tests to monitor students' improvement in English abilities.

All newly matriculated students in April 2015 or after must take the TOEIC IP test twice during their enrollment. If students enter JAIST in April or in October, they take one on the first day of enrollment and one 18 months later. If students enter JAIST at other times, they take one offered closest to the first day of enrollement and another 18 months later. Students who need to take TOEIC for employment purposes or progression within JAIST (from master's program to doctoral), they can take the test offered in August and February.

Students are expected to get a TOEIC score of 600 or higher by graduation. If they do not achieve this in 18 months, they must take the next TOEIC available after the last one they took.

Test schedule

On the Ishikawa Campus

1. **TOEIC IP** only for students enrolled in April, 2015.
   Monday, April 6 14:30 ~ 17:00
2. **TOEIC IP**
   Friday, August 7 15: 30 ~ 18:00

3. **TOEIC IP**
   Friday, October 2 14:30 ~ 17:00
4. **TOEIC IP**
   Friday, February 5, 2016 15: 30 ~ 18:00

5.2 Communication courses (Technical Japanese Education Program)

5.2.1 System of technical Japanese courses

The Technical Japanese Education Program provides international students Japanese language courses to obtain basic knowledge of Japanese language and skills necessary for daily life and to acquire advanced level of Japanese language necessary for business or academic and research activities. The introductory Technical Japanese courses and Basic Technical Japanese courses aim to provide training to obtain a sufficient level of daily oral communication skills and essential reading skills. International students from countries not using Chinese characters are trained to master Japanese letters including some basic Chinese characters. Intermediate Technical Japanese courses focus on obtaining sentence patterns to understand complex sentences and short articles. Advanced Technical Japanese courses are designed for international students holding a high level of Japanese proficiency to obtain advanced Japanese language skills including business communication, presentation and discussion in the field of science and technology, and writing documents so that they will be able to work or continue research in Japan after graduation from JAIST.

Introductory Technical Japanese courses: J011 System of Japanese Letters and Nominal Sentences, J012 Simple Sentences Using Verbs in Masu-form

These courses provide beginners with the foundations of Japanese language through practices in *Hiragana* and *Katakana*, basic conversation, listening comprehension, and composition, thereby increasing their motivation to study Japanese language further.

Basic Technical Japanese courses: J111 Adjective Sentences and Existential Sentences, J112 Complex Sentences Using the Verbs in Te-form

These courses are designed to help students acquire skills to handle a series of easy conversations, use colloquial expressions, comprehend short readings and write short sentences through practices in essential Chinese characters, and introductory level vocabulary, sentence patterns, grammar, and expressions (The goal is the N5/N4 levels of JLPT).

Intermediate Technical Japanese courses: J211 Nai-form of Verbs, Dictionary-form and Basic Function Sentence Patterns, J212 Ordinary Style, Continuous Modification Paragraphs and Practical Function Sentence Patterns

These courses provide skills for conversations appropriate to a variety of situations and human relations, understanding Japanese sentences on familiar topics, and expressing ideas and opinions through practices of intermediate-level Chinese characters and functional expressions necessary for communication (The goal is the N3/N2 level of JLPT).

Advanced Technical Japanese: J411 Reading Comprehension and Conversation, J412 Composition and Presentation

These courses are designed to provide language skills necessary for academic life through practice of advanced-level Chinese characters, reading and writing academic papers or reports, and academic discussions and presentations (The goal is the N2/ N1 level of JLPT).

5.2.2 Course listing

Course Number	Course Title	Class Terms				Instructor (s)	Notes
J011	Introductory Technical Japanese 1	1-1		2-1		Tsutsui	Non-credit
J012	Introductory Technical Japanese 2		1-2		2-2	Tsutsui	Non-credit
J111	Basic Technical Japanese 1	1-1		2-1		Yamaguchi	
J112	Basic Technical Japanese 2		1-2		2-2	Yamaguchi	
J211	Intermediate Technical Japanese 1	1-1		2-1		Horiguchi	
J212	Intermediate Technical Japanese 2		1-2		2-2	Horiguchi	
J411	Advanced Technical Japanese 1	1-1		2-1		Honda	
J412	Advanced Technical Japanese 2		1-2		2-2	Honda	

Note 1: Depending on the number of registering students, some courses may be offered in more than one time slot in the same term.

5.3 Other communication courses (language and culture)

G211 Global Communication for Collaboration Building, G212 Writing and Presentation Skills, and G213 Japan Studies are offered to develop students' knowledge and skills necessary to enable students to adapt themselves to living and working in a multi-cultural global society.

Course listing

Course Number	Course Title	Lan-guage *	Class Terms				Instructor (s)	Notes
G211	Global Communication for Collaboration Building	E		1-2		2-2	Kawanishi	
G212	Writing and Presentation Skills	J	1-1		2-1		Tsuji	
G213	Japan Studies	E	1-1		2-1		Kawanishi	

***** "J" indicates that the course is offered in Japanese; "E" in English.

6 Career Education Department (career-enhancing courses)

The Career Education Department offers career-enhancing courses for students to assist them to become professionally and socially independent. While respecting students' knowledge and skills in their specialized areas, we cultivate their perspectives and practical ability to utilize their specialist knowledge and skills in society. We also encourage students to acquire the habit of thinking for the future relationship between themselves and the society while pursuing scientific and technological excellence in their areas of specialization. We also seek to develop their abilities to present their research to people in various fields and to understand and discuss issues outside their own field in their own ways. Through our courses, we hope that students will rebuild their concept of values for research and development in a social value chain. The targets of career-enhancing courses are to nurture creative technologists, who are able to learn and apply knowledge and skills in their own fields, communicate with people in various fields, and open the future by using those abilities.

6.1 Course listing

Course Number	Course Title	Lan-guage *	Class Terms	Instructor(s)	Notes
Career Development Courses					
B101	Career Development Basic**	J	1-2	Kohda, etc.	
B201	Career Development Expansive	J	September	Hashizume	1 credit
		E	February	Seryo	1 credit
Career Practical Skill Courses					
B211	Business Management & Entrepreneurship	J	September	Yanagishita	
		E	February		
B212	Basic Project Management	J	September	Miura	
		E	February		
B213	Career Awareness Development	J	Offered as necessary	Kohda, etc.	1 credit
B411	Advanced Project Management	E	September	Tanaka	
		J	February		

***** "J" indicates that the course is offered in Japanese; "E" in English.

****** The first class of B101 is held on Wednesday, April 8.

School of Knowledge Science

School of Knowledge Science

1 Outline of the school

The educational and research system of School of Knowledge Science (KS school) has been developed through the restructuring and integration of disciplines in the fields of systems science, natural science, information science, cognitive science, social science, and humanities. The school engages in research into individual, organizational, societal, and natural activities from the perspective of “knowledge creation”, and explores the issues, “What is knowledge?” and “How is knowledge created?”

The school also aims to nurture human resources, pioneers of the knowledge society in the 21st century capable of identifying and solving problems, and designing and implementing technological, organizational, and social innovation.

The research objectives are as follows:

- Knowledge Structure; Knowledge Representation; Scientific Knowledge; Social Knowledge; Policy Knowledge; Traditional Knowledge (Wisdom); Tacit Knowledge
- Knowledge Management in Organization and Society; Knowledge-based Management of Technology; Knowledge-based Project Management; Technological, Organizational, and Social Innovation as Knowledge Creation; Knowledge Economy; Knowledge Society
- Human Cognition, Intelligence and Creativity; Embodied Knowledge; Individual Knowledge Creation; Knowledge Technology; Knowledge Systems; Data Mining; Knowledge Creative Technologies; Design as Knowledge Creation
- Complex Phenomena such as Networking and Evolution in Society, Technology and Nature; Systems Methodologies; Modeling and Simulation; Constructive Approach; Systems Analysis for Environmental Issues; Systems Analysis for Regional Issues
- Service Innovation; Service Management; Service Value Creation; Service Marketing; Medical Service

These objectives cover a wide range of academic fields that surpass conventional academic frameworks and enable students to freely set their research themes from any viewpoint of knowledge.

We use intellectual techniques and technologies, group creation technology, and modeling & simulation in our research, and place great importance on field work, the gathering and analysis of data and knowledge creation in the field. We conduct both theoretical research to establish theoretical models for the explanation of phenomena, and practical research to resolve real and actual issues. We also encourage collaboration on research activities with regional and overseas organizations.

With this type of research as a backdrop, we have integrated various bases of knowledge from systems science, natural science, cognitive science, information science, social science, and humanities. We nurture managers and engineers with advanced expertise, managers with expertise in technology and engineers with expertise in management, and knowledge scientists, scientists with research prowess in the field of knowledge science as a graduate school that develops advanced science and technology in accordance with the needs of a rapidly changing society.

Research subjects of the KS school are concentrated mainly in the following four (three fundamental and one applied) areas in accordance with students’ research interests and the expertise of our faculty members.

◇ Social knowledge

Within this area, research is conducted on the processes of creating, sharing, and utilizing knowledge in groups, organizations, and society. Also, this area educates knowledge managers who have academic knowledge and practical skill in knowledge management and management

of technology (MOT) in business, government, NPOs, and regional communities, thereby producing technological, organizational, and social innovations.

◇ Knowledge media

Within this area, research is conducted on human capabilities for discovering and representing items of knowledge. This area also allows students to systematically acquire knowledge and skills to develop knowledge-intensive systems with digital media and knowledge-base. Students are expected to play leading roles in creating a knowledge society by applying their knowledge and skills to the advancing frontiers of information and communication technologies.

◇ Systems knowledge

Within this area, research is conducted on the processes of creating, sharing, and utilizing knowledge in complex phenomena in natural and social systems based on systems science using systems methodologies, modeling and simulation. Research activities in this area nurture knowledge workers capable of contributing to the analysis and solution of problems and issues in these domains.

◇ Service knowledge

Within this area, research is conducted on the processes of service value creation, the sharing and utilization of service knowledge in enterprise or organizations. This area also allows service knowledge managers to achieve technical, organizational, and social innovation by providing them with practical know-how, skills and techniques for service management in enterprise and organizations.

Dean: Professor Yukari Nagai

Number of students

	Master's program	Doctoral program
Department of Knowledge Science	86	28

2 Faculty profiles

◇ School of Knowledge Science

Name	Position	Specialization
Social Knowledge		
IKAWA, Yasuo[*4]	Research Professor	Technology Management, R&D Management, Technology Strategy, Electronics and Semiconductor Industry Strategy, Innovation Management
UCHIHIRA, Naoshi	Professor	R&D Management, Service Design Methodology, Software Engineering
UMEMOTO, Katsuhiro	Professor	Knowledge Management
OKUWADA, Kumi	Visiting Professor	Science and Technology Policy, Innovation Policy, Science and Technology Foresight, Nanotechnology and Material Process Technology
KONDOU, Shuuji	Visiting Professor	Management Consulting, Innovation Management, New Industries Creation & Human Development
TANAKA, Hiroshi	Visiting Professor	Project Manegement
TOYAMA, Ryoko	Visiting Professor	Corporate Strategy, Innovation Theory
NAGATA, Akiya	Visiting Professor	Sceience and Technology Policy, Economics of Industrial Innovation
ITO, Yasunobu	Associate Professor	Cultural Anthropology, Sociology of Knowledge, Ethnography
PELTOKORPI, Vesa Matti	Associate Professor	Knowledge Management, International Human Resource Management, Transactive Memory Systems
MIZUMOTO, Masaharu[*3]	Associate Professor	Analytic Philosophy, Wittgenstein, Epistemology, Philosophy of Mind
SASAKI, Yasuo	Assistant Professor	Decision Systems Science
Knowledge Media		
KUNIFUJI, Susumu	Visiting Professor	Creativity Support Systems, Groupwares, Knowledge-based Systems
NAGAI, Yukari	Professor	Design Creativity, Design Knowledge, Design Thinking, Communication Design
NISHIMOTO, Kazushi[*1]	Professor	Creativity Support, Media Interaction, Informal Communications, Musical Information Processing
FUJINAMI, Tsutomu	Professor	Skill Science, Embodied Cognitive Science, Information and Communication Technologies (ICT) for Dementia Care
HO, Bao Tu	Professor	Machine Learning, Knowledge Discovery and Data Mining, Text Mining, Computational Science
MIYATA, Kazunori	Professor	Computer Graphic, Media Integration, Procedural Modeling, Material Rendering
DAM, Hieu Chi	Associate Professor	Computational Science, Knowledge Discovery and Data Mining
YAMASHITA, Kunihiro[*1]	Associate Professor	Software Engineering, Software Development Environment
YUIZONO, Takaya	Associate Professor	Groupware for Knowledge Creation, Computer-Supported Cooperative Work, Cross Cultural Collaboration
URA, Masahiro	Assistant Professor	Art and Science, Teaching and Learning Support, Regional Activation
ZELAYA ZAMORA, Jader Enrique	Assistant Professor	Knowledge Management, Design Management
HIDAKA, Shohei	Assistant Professor	Cognitive Science, Language Development, Behavioral Time Series Analysis
LE, Tu Ngoc	Assistant Professor	Data Mining, Knowledge Discovery from Data, Bioinformatics
Systems Knowledge		
NAKAMORI, Yoshiteru	Visiting Professor	Systems Methodology, Decision Analysis, Kansei Engineering
HASHIMOTO, Takashi	Professor	Complex Systems, Evolutionary Linguistics, Evolutionary Economics, Artificial Life
YOSHIDA, Taketoshi	Professor	Systems Methodology, Knowledge Management, Tacit Knowing
HAYASHI, Yukio	Associate Professor	Complex Network Science, Ad Hoc Wireless Communication, Self-organization, Distributed Computing
HUYNH, Nam Van	Associate Professor	Decision Analysis, Computational Intelligence, Knowledge Modelling
KOBAYASHI, Shigeto	Assistant Professor	Evolutionary Economics, Institutional Design, Social Simulation, Gaming
KONNO, Takeshi	Research Assistant Professor	Cognitive Science, Cognitive Developmental Robotics, Evolutionary Linguistics
Service Knowledge		
IKEDA, Mitsuru	Professor	Knowledge Engineering, Ontology Engneering, Medical Service Science, Educational Technology, e-Learning, Knowledge Management System
KOHDA, Youji	Professor	Internet Service, Service Science, Business Innovation
KOSAKA, Michitaka	Professor	Innovation Process, Research and Development Management, Business Information System, Stochastic Control System
MIZOGUCHI, Riichiro[*2]	Research Professor	Ontological Engineering, Artificial Inteligence, Intelligent Learning Support System
KANAI, Hideaki[*1]	Associate Professor	Social computing, Persuasive technology, Pervasive Healthcare, Semantic Web
SHIRAHADA, Kunio	Associate Professor	Service marketing, Organization management, Technology management
TANAKA, Koji	Assistant Professor	Cognitive psychology, Disaster Information, Educational Technology
MASUDA, Hisashi	Assistant Professor	Service Science, Service Marketing, Applied Microeconomics, Knowledge Engineering
SUMI, Tadao	Visiting Professor	Developing Management Skills in Engineers and Researchers, Service Business in the Manufacturing Industry
Maekawa, Masami	Research Associate Professor	Interface Design, Kansei Engineering

***1** The instructor belongs to the Research Center for Innovative Lifestyle Design and concurrently works as a faculty member for the KS school.
***2** The instructor belongs to the Research Center for Service Science and concurrently works as a faculty member for the KS school.
***3** The instructor belongs to the Institute of General Education and concurrently works as a faculty member for the KS school.
***4** The instructor belongs to the Center for Advanced Education for Working Professionals and concurrently works as a faculty member for the KS school.

◇ Chairs operated jointly with research institutes and/or companies

Name	Position	Specialization
Industrial Policy Systems (Mitsubishi Research Institute, Inc.)		
OKUDA, Akinobu	Visiting Professor	Technology Policy and Technology Strategy, R&D Strategy and Technology Evaluation, Automobile and Aerospace Business Strategy
Noro, Yoshihisa	Visiting Professor	Research and Consulting of Marketing/ Product Development, Industrial Organization, Competitive Strategy
Corporate Strategy Systems (Nomura Research Institute, Ltd.)		
IKEZAWA, Naoki	Visiting Professor	Theory of Technology Strategies, Theory of Project Strategies, Knowledge Management
NITTO, Hiroyuki	Visiting Professor	Marketing, Consumer Behavior Analysis, Theory of Project Strategies
Knowledge Business Creation (Fujitsu, Ltd.)		
TAKADA, Yuji	Visiting Professor	Service Oriented Architecture, Cloud Computing, SaaS/PaaS
ARIMA, Jun	Visiting Professor	Change Manegement, Knowledge Management
YAGI, Ryuhei	Visiting Associate Professor	Social Design, Qualitative Research, Psychometric
Intelligent Production Systems (Hitachi, Ltd)		
AKATSU, Masaharu	Visiting Professor	Information System, Service Management, R&D Management
NAGASAKA, Akio	Visiting Professor	Intelligent Graphic Handling, Video Image Processing, Multimedia Processing
Management of Industry-Academy Collaboration (Ministry of Economy, Trade and Industry)		
YASUNAGA, Yuko	Visiting Professor	Theory of Innovation, Technology Roadmapping, R&D Management, Theory of Semiconductor Business, Theory of Resource Policy
Intelligent Media (Advanced Telecommunications Research Institute International)		
MIYASHITA, Takahiro	Visiting Professor	Robotics, Control Engineering, Sensor Network, Human-Robot Interaction, Ambient Intelligence, Tactile Sensing, Tactile Communications
KOIZUMI, Satoshi	Visiting Associate Professor	Intelligent Robot, Human-Robot Interaction, Hyper Omni Vision, Sensor Network
Knowledge Science Chair Cooperated with Vietnam FIVE Institutes*		
CAO, Tru Hoang	Visiting Professor	Automatic reasoning, Conceptual Graph and Fuzzy Logic, Semantic Web, Text Mining, Machine Learning
Service Technology (Advanced Industrial Science and Technology)		
IZUMI, Noriaki	Visiting Associate Professor	Artificial Intelligence, Knowledge Engineering, Service System Development
MORI, Akira	Visiting Associate Professor	Fundamental Software Engineering, Network Security, Ubiquitous Computing, Service Engineering
Medical Service Knowledge Science (Miyazaki University, Juntendo University)		
SATO, Nobuhiro	Visiting Professor	Internal Medicine, Medical Education, Medical Service Science
ARAKI, Kenji	Visiting Professor	Medical Infomatics, Hospital Management, Artificial Organ, Medical Service Science
SUZUKI, Muneo	Visiting Associate Professor	Medical Infomatics, Hematology, Medical Service Science
Technology Management (University of Cambridge)		
PROBERT, David Rhys	Visiting Professor	Technology and innovation strategy, Technology management process, Make or Buy strategy, Industrial sustainability
PHAAL, Robert	Visiting Professor	Strategic technology management, Strategic technology roadmapping
Thai Knowledge Science (Thammasart University, NECTEC)		
UDOMVITID, Kalaya	Visiting Professor	Technology management, Service innovation
SUPNITHI, Thepchai	Visiting Professor	Knowledge engineering, Natural language processing, Educational engineering, Service engineering
KONGPRAWECHNON, Waree	Visiting Associate Professor	Control engineering, Biomedical signal/image processing

***** FIVE Institutes indicate University of Science, Vietnam National University-Ho Chi Minh City (HCMUS), University of Technology, Vietnam National University-Ho Chi Minh City (HCMUT), Institute of Information Technology, Vietnamese Academy of Science and Technology (IOIT, VAST), Hanoi University of Science and Technology (HUST), Vietnam National University, University of Engineering and Technology (VNU-UET).

3 Class schedule for 2015-2016

Term 1-1 (April 8 – June 5)

School of Knowledge Science

	1 9:20-10:50	2 11:00-12:30	3	4 15:10-16:40	5 16:50-18:20
Mon.	K470 Introduction to Knowledge Creation **(Kunifuji･Yamaura)** K613E Social-Technical Complex Systems **(Huynh)**	K228 Introduction to Knowledge Science 1 **(Hashimoto･Dam, etc.)**	**Office Hours (13:30 ~ 15:00)**	G212 Writing and Presentation Skills **(Tsuji)** G213E Japan Studies **(Kawanishi)**	L211 Logic and Mathematics **(Preining)** L212E History and Philosophy of Science **(Mizumoto)** L214 A Methodology for Innovation Design **(Kunifuji, etc.)**
Tue.	K213 Methodology for Systems Science **(Nakamori)** K471 Media Creation **(Miyata･Ura)**	K112EJ Basic Mathematics for Data Analytics **(Ho･Dam)** K469 Knowledge Creation Support Systems **(Nishimoto)**		E011 Interaction Seminar 1 E111 Basic TC 1 E211 Intermediate TC 1 E213 Scientific Discussions 1 J011A Introductory Technical Japanese 1 J111A Basic Technical Japanese 1 J211 Intermediate Technical Japanese 1 J411 Advanced Technical Japanese 1	E021 Interaction Seminar 2 E113 Basic TC 3 E212 Intermediate TC 2 E411 Advanced TC 1 J011B Introductory Technical Japanese 1 J111B Basic Technical Japanese 1
Wed.	K119 Introduction to Computer Programming **(Kobayashi)** K211 Methodology for the Social Sciences **(Ito)**	K470 Introduction to Knowledge Creation **(Kunifuji･Yamaura)** K613E Social-Technical Complex Systems **(Huynh)**		G212 Writing and Presentation Skills **(Tsuji)** G213E Japan Studies **(Kawanishi)**	L211 Logic and Mathematics **(Preining)** L212E History and Philosophy of Science **(Mizumoto)** L214 A Methodology for Innovation Design **(Kunifuji, etc.)**
Thu.	K228 Introduction to Knowledge Science 1 **(Hashimoto･Dam, etc.)**	K213 Methodology for Systems Science **(Nakamori)** K471 Media Creation **(Miyata･Ura)**		E011 Interaction Seminar 1 E111 Basic TC 1 E211 Intermediate TC 1 E213 Scientific Discussions 1 J011A Introductory Technical Japanese 1 J111A Basic Technical Japanese 1 J211 Intermediate Technical Japanese 1 J411 Advanced Technical Japanese 1	E021 Interaction Seminar 2 E113 Basic TC 3 E212 Intermediate TC 2 E411 Advanced TC 1 J011B Introductory Technical Japanese 1 J111B Basic Technical Japanese 1
Fri.	K112EJ Basic Mathematics for Data Analytics **(Ho･Dam)** K469 Knowledge Creation Support Systems **(Nishimoto)**	K119 Introduction to Computer Programming **(Kobayashi)** K211 Methodology for the Social Sciences **(Ito)**			

NOTE:

- The first class of B101 will be held on Wednesday, April 8. The second and subsequent classes of B101 will be held in Term 1-2.
- All lectures except B101 in this term will start on Thursday, April 9 and the day will follow the WEDNESDAY schedule.
- Friday, June 5 will follow the MONDAY schedule.
- The course number with EJ indicates they are offered in both English and Japanese.

Term 1-2 (June 10 – August 3)

School of Knowledge Science

	1 9:20-10:50	2 11:00-12:30	3	4 15:10-16:40	5 16:50-18:20
Mon.	K121 Introduction to Cognitive Science **(S.Hidaka)** K214 Methodology for Knowledge Media **(Yuizono)** K421E Essence of System Methodologies **(T.Yoshida)**	K114 Introduction to Social Research Methods **(Masuda)** K417EJ Data Analytics **(Ho・Dam)** K444 Design Cognition **(Nagai)**		N008 Nano Quantum Device Materials (*) B101 Career Development Basic **(Kohda, etc.)** G211E Global Communication for Collaboration Building **(Kawanishi)**	N008 Nano Quantum Device Materials (*) B101 Career Development Basic **(Kohda, etc.)**
Tue.	K229 Introduction to Knowledge Science 2 **(Yuizono・Ito, etc.)**	K123 A Basic Study on RealWorld Oriented Interface **(K.Yamashita)** K236EJ Basis of Data Analytics **(Ho・Dam)** K412 The Knowledge Society **(Ito)**		N006 Nano IT Materials (*) E011 Interaction Seminar 1 E112 Basic TC 2 E211 Intermediate TC 1 J012A Introductory Technical Japanese 2 J112A Basic Technical Japanese 2 J212 Intermediate Technical Japanese 2 J412 Advanced Technical Japanese 2	N006 Nano IT Materials (*) E021 Interaction Seminar 2 E113 Basic TC 3 E212 Intermediate TC 2 E412 Advanced TC 2 J012B Introductory Technical Japanese 2 J112B Basic Technical Japanese 2
Wed.	K472 Media Interaction **(Nishimoto)** K473 Management of Innovation **(Uchihira)** E413 Scientific Discussions 2 **(Blake)**	K121 Introduction to Cognitive Science **(S.Hidaka)** K214 Methodology for Knowledge Media **(Yuizono)** K421E Essence of System Methodologies **(T.Yoshida)**	**Office Hours (13:30 ~ 15:00)**	N007 Nano Biodevice Materials (*) G211E Global Communication for Collaboration Building **(Kawanishi)**	N007 Nano Biodevice Materials (*)
Thu.	K114 Introduction to Social Research Methods **(Masuda)** K417EJ Data Analytics **(Ho・Dam)** K444 Design Cognition **(Nagai)**	K229 Introduction to Knowledge Science 2 **(Yuizono・Ito, etc.)**		E011 Interaction Seminar 1 E112 Basic TC 2 E211 Intermediate TC 1 J012A Introductory Technical Japanese 2 J112A Basic Technical Japanese 2 J212 Intermediate Technical Japanese 2 J412 Advanced Technical Japanese 2	E021 Interaction Seminar 2 E113 Basic TC 3 E212 Intermediate TC 2 E412 Advanced TC 2 J012B Introductory Technical Japanese 2 J112B Basic Technical Japanese 2
Fri.	K123 A Basic Study on RealWorld Oriented Interface **(K.Yamashita)** K236EJ Basis of Data Analytics **(Ho・Dam)** K412 The Knowledge Society **(Ito)**	K472 Media Interaction **(Nishimoto)** K473 Management of Innovation **(Uchihira)** E413 Scientific Discussions 2 **(Blake)**			

NOTE:

- The lectures with EJ indicates they are offered in both English and Japanese.
- * N00x courses will be offered by the faculty of Center for Nano Materials and Technology and School of Materials Science.

Term 2-1 (October 7 – December 2)

School of Knowledge Science

	1 9:20-10:50	2 11:00-12:30	3	4 15:10-16:40	5 16:50-18:20
Mon.	K411E Theory of Knowledge Management **(Peltokorpi)** K411 Theory of Knowledge Management **(Hirata･T.Hayashi)** K418 Representation of Knowledge **(Yuizono)**	K228E Introduction to Knowledge Science 1 **(Hashimoto･Dam, etc.)** K421 Essence of System Methodologies **(T.Yoshida)**	**Office Hours (13:30 ~ 15:00)**	N001 Fabrication of Nano-Devices with Training Course(*) G212 Writing and Presentation Skills **(Tsuji)** G213E Japan Studies **(Kawanishi)**	N001 Fabrication of Nano-Devices with Training Course(*) L211E Logic and Mathematics **(Preining)** L212 History and Philosophy of Science **(Mizumoto)** L214E A Methodology for Innovation Design **(Kunifuji, etc.)**
Tue.	K119 Introduction to Computer Programming **(Ura)** K481 Next-Generation Management of Technology **(Umemoto･Kohda, etc.)**	K211E Methodology for the Social Sciences **(Umemoto)** K479 Service Management **(Shirahada)**		N002 Study on Nanobiotechnology with Training Course(*) E011 Interaction Seminar 1 E111 Basic TC 1 E211 Intermediate TC 1 E213 Scientific Discussions 1 J011A Introductory Technical Japanese 1 J111A Basic Technical Japanese 1 J211 Intermediate Technical Japanese 1 J411 Advanced Technical Japanese 1	N002 Study on Nanobiotechnology with Training Course(*) E021 Interaction Seminar 2 E113 Basic TC 3 E212 Intermediate TC 2 E411 Advanced TC 1 J011B Introductory Technical Japanese 1 J111B Basic Technical Japanese 1
Wed.	K414 Complex Systems Analysis **(Hashimoto)** K433 Practice of MOT Innovations **(Kondou)**	K411E Theory of Knowledge Management **(Peltokorpi)** K411 Theory of Knowledge Management **(Hirata･T.Hayashi)** K418 Representation of Knowledge **(Yuizono)**		N003 Analysis of Nano Materials with Training Course(*) G212 Writing and Presentation Skills **(Tsuji)** G213E Japan Studies **(Kawanishi)**	N003 Analysis of Nano Materials with Training Course(*) L211E Logic and Mathematics **(Preining)** L212 History and Philosophy of Science **(Mizumoto)** L214E A Methodology for Innovation Design **(Kunifuji, etc.)**
Thu.	K228E Introduction to Knowledge Science 1 **(Hashimoto･Dam, etc.)** K421 Essence of System Methodologies **(T.Yoshida)**	K119 Introduction to Computer Programming **(Ura)** K481 Next-Generation Management of Technology **(Umemoto･Kohda, etc.)**		N004 Structural Analysis of Solids on Nano-Scale with Training Course(*) E011 Interaction Seminar 1 E111 Basic TC 1 E211 Intermediate TC 1 E213 Scientific Discussions 1 J011A Introductory Technical Japanese 1 J111A Basic Technical Japanese 1 J211 Intermediate Technical Japanese 1 J411 Advanced Technical Japanese 1	N004 Structural Analysis of Solids on Nano-Scale with Training Course(*) E021 Interaction Seminar 2 E113 Basic TC 3 E212 Intermediate TC 2 E411 Advanced TC 1 J011B Introductory Technical Japanese 1 J111B Basic Technical Japanese 1
Fri.	K211E Methodology for the Social Sciences **(Umemoto)** K479 Service Management **(Shirahada)**	K414 Complex Systems Analysis **(Hashimoto)** K433 Practice of MOT Innovations **(Kondou)**			

NOTE:

- Wedensday, October 7 will follow the MONDAY schedule.
- * N00x courses will be offered by the faculty of Center for Nano Materials and Technology and School of Materials Science.

Term 2-2 (December 4 – February 8)

School of Knowledge Science

	1 9:20-10:50	2 11:00-12:30	3	4 15:10-16:40	5 16:50-18:20
Mon.	K115 Introduction to Logic **(Kujifuji)** K611E Next-Generation Management of Technology **(Kohda)**	K213E Methodology for Systems Science **(Nakamori･Huynh)**	**Office Hours (13:30 ~ 15:00)**	G211E Global Communication for Collaboration Building **(Kawanishi)**	
Tue.	K111 Introduction to Business Management **(Shirahada)** K214E Methodology for Knowledge Media **(Kanai)**	K230E Introduction to Knowledge Science 3 **(Huynh･Fujinami, etc.)** K420 Research & Development Management **(Kosaka)**		E011 Interaction Seminar 1 E112 Basic TC 2 E211 Intermediate TC 1 J012A Introductory Technical Japanese 2 J112A Basic Technical Japanese 2 J212 Intermediate Technical Japanese 2 J412 Advanced Technical Japanese 2	E021 Interaction Seminar 2 E113 Basic TC 3 E212 Intermediate TC 2 E412 Advanced TC 2 J012B Introductory Technical Japanese 2 J112B Basic Technical Japanese 2
Wed.	K464EJ Cognitive Science **(Fujinami)** E413 Scientific Discussions 2 **(Blake)**	K115 Introduction to Logic **(Kujifuji)** K611E Next-Generation Management of Technology **(Kohda)**		G211E Global Communication for Collaboration Building **(Kawanishi)**	
Thu.	K213E Methodology for Systems Science **(Nakamori･Huynh)**	K111 Introduction to Business Management **(Shirahada)** K214E Methodology for Knowledge Media **(Kanai)**		E011 Interaction Seminar 1 E112 Basic TC 2 E211 Intermediate TC 1 J012A Introductory Technical Japanese 2 J112A Basic Technical Japanese 2 J212 Intermediate Technical Japanese 2 J412 Advanced Technical Japanese 2	E021 Interaction Seminar 2 E113 Basic TC 3 E212 Intermediate TC 2 E412 Advanced TC 2 J012B Introductory Technical Japanese 2 J112B Basic Technical Japanese 2
Fri.	K230E Introduction to Knowledge Science 3 **(Huynh･Fujinami, etc.)** K420 Research & Development Management **(Kosaka)**	K464EJ Cognitive Science **(Fujinami)** E413 Scientific Discussions 2 **(Blake)**			

NOTE:

- Friday, December 4 will follow the WEDNESDAY schedule.
- The lectures with EJ indicates they are offered in both English and Japanese.

4 Curriculum

Students in the KS school must read both parts of the Institute-wide Study Guide and this guide for the KS students carefully and thoroughly.

4.1 Outline of the curriculum

Based on JAIST's mission statement, the curriculum of the KS school is designed to help students systematically progress from the basics of knowledge science to its cutting-edge frontiers while acquiring fundamental academic skills that will enable them to make significant contributions to the development of state-of-the-art technologies and the resolution of current and future problems faced by society.

It is insufficient for students merely to take lectures with a passive attitude. To acquire abilities that will benefit them in the future, students are required to actively sow and nurture the seeds of social, organizational, or technical innovation of the next era by themselves toward a thorough understanding of advanced science and technology, and social and organizational problems through their learning process.

4.2 The courses in the school of Knowledge Science (KS school courses/Kxxx series)

The KS school courses are classified into following 4 groups; Introductory, Basic, Technical, and Advanced Courses.

Introductory courses (K1xx):	are designed to provide foundations of knowledge science at a graduate level education mainly for beginners to knowledge science.
Basic courses (K2xx):	are designed to provide students with essential knowledge, ways of thinking, research methodologies, and an awareness of the issues related to knowledge science.
Technical courses (K4xx):	offer highly specialized content in the various fields of knowledge.
Advanced courses (K6xx):	offer more highly specialized content to students in the doctoral program and are taught in English.

4.3 KS school courses for students at the Ishikawa campus

The tables below list courses, credits, terms, and instructors.

(1) The J, E, EJ codes in the language row of the table indicate the language of instruction: J indicates that the course is offered in Japanese; E indicates that the course is offered in English; and EJ indicates that the course is offered both in English and Japanese, making it possible for both Japanese and English speakers to take the course.

(2) The KS school courses are classified into 3 broad areas, Social Knowledge (A), Knowledge Media (B) and Systems Knowledge (C). Students must take courses in more than one area in order to acquire the ability to think from a variety of perspectives and multifaceted viewpoints.

4.3.1 Introductory courses

Course number	Course title	Lan-guage	Course term	Instructor(s)	Note	Area(s)
K111	Introduction to Business Management	J	2-2	Shirahada		A
K112	Basic Mathematics for Data Analytics*	EJ	1-1	Ho・Dam		A, B, C
K114	Introduction to Social Research Methods	J	1-2	Masuda		A, C
K115	Introduction to Logic	J	2-2	Kunifuji		A, B, C
K119	Introduction to Computer Programming	J	1-1 2-1	Kobayashi, Ura		B, C
K121	Introduction to Cognitive Science	J	1-2	S.Hidaka		B, C

K123	A Basic Study on RealWorld Oriented Interface	J	1-2	K.Yamashita		B

***** If students have completed K116, they cannot take K112.

4.3.2 Basic courses

Master's students must take at least 1 course in each of the 3 fundamental areas of Social Knowledge (A), Knowledge Media (B) and Systems Knowledge (C) as electives.

Course number	Course title	Lan-guage	Course term	Instructor(s)	Note	Areas
K211	Methodology for the Social Sciences	J	1-1	Ito		A
		E	2-1	Umemoto		
K213	Methodology for Systems Science	J	1-1	Nakamori		C
		E	2-2	Nakamori・Huynh		
K214	Methodology for Knowledge Media*	J	1-2	Yuizono		B
		E	2-2	Kanai		
K228	Introduction to Knowledge Science 1	J	1-1	Hashimoto・Dam, etc.		A, B, C
		E	2-1	Hashimoto・Dam, etc.		
K229	Introduction to Knowledge Science 2	J	1-2	Yuizono・Ito, etc.		A, B, C
K230	Introduction to Knowledge Science 3	E	2-2	Huynh・Fujinami, etc.		A, B, C
K236	Basis of Data Analytics	EJ	1-2	Ho・Dam		B

***** If students have completed K225, they cannot take K214.

4.3.3 Technical courses

Course number	Course title	Lan-guage	Course term	Instructor(s)	Notes	Areas
K411	Theory of Knowledge Management	J	2-1	Hirata・T.Hayashi		A
		E	2-1	Peltokorpi		
K412	The Knowledge Society	J	1-2	Ito		A
K413	Comparative Study of Knowledge Institutions	J	Intensive Course	Nagata	Offered in alternate years	A
K414	Complex Systems Analysis	J	2-1	Hashimoto		C
K417	Data Analytics	EJ	1-2	Ho・Dam		B
K418	Representation of Knowledge	J	2-1	Yuizono		B
K420	Research & Development Management	J	2-2	Kosaka		A
K421	Essence of System Methodologies	E	1-2	T. Yoshida		A, C
		J	2-1			
K427	Theory on Creative Process in Design	J		Nagai	Offered in alternate years *	B
K433	Practice of MOT Innovations	J	2-1	Kondou		A
K444	Design Cognition	J	1-2	Nagai	Offered in alternate years	B
K464	Cognitive Science	EJ	2-2	Fujinami		B
K469	Knowledge Creation Support Systems	J	1-1	Nishimoto		B

K470	Introduction to Knowledge Creation	J	1-1	Kunifuji・Yamaura		A, B, C
K471	Media Creation	J	1-1	Miyata・Ura		B
K472	Media Interaction	J	1-2	Nishimoto		B
K473	Management of Innovation	J	1-2	Uchihira		A
K479	Service Management	J	2-1	Shirahada		A
K480	Methodology for Regional Revitalization	J	Intensive Course	Kunifuji・Yamaura・Shirahada		A, B, C
K481	Innovation Theory and Methodology for Total Capability Development	J	2-1	Umemoto・Kohda, etc.	Non-credit	A, B, C

***** The course is not offered in the 2015 academic year.

4.3.4 Advanced courses

If master's students take the Advanced courses, the courses will be considered as the Technical courses and credits from these courses can be used to fulfill the requirements for the master's program.

Course number	Course title	Lan-guage	Course term	Instructor(s)	Notes	Areas
K611	Next-Generation Management of Technology	E	2-2	Kohda	Offered in alternate years	A
K612	Next-Generation Knowledge Management	E		Peltokorpi	Offered in alternate years *	A
K613	Social-Technical Complex Systems	E	1-1	Huynh	Offered in alternate years	C
K619	Advanced Data Analytics	E		Ho・Dam	*	B, C
K626	Advanced Topics in Media Design	E		Miyata・Nagai・Kanai・Miyashita・Koizumi	Offered in alternate years *	B

***** The course is not offered in the 2015 academic year.

4.4 Seminar and research

Courses for a major research project (seminar) and a minor research project(research) are below. For doctoral students, a minor research project can be substituted for an internship.

Master's program

Course number	Course title	Instructor(s)	Notes
K201	Seminar in Knowledge Science A (Thesis)	Supervisor	Research Guidance, 8 credits, compulsory elective course
K205	Seminar in Knowledge Science A (Project Report)	Supervisor	Research Guidance, 2 credits, compulsory elective course
K202	Research in Knowledge Science A	Advisor for Minor Research Project	Research Guidance, 2 credits, compulsory course

Doctoral program

Course number	Course title	Instructor(s)	Notes
K601	Advanced Seminar in Knowledge Science B	Supervisor	6 credits; compulsory course
K602	Advanced Research in Knowledge Science B1 (Minor Research Project)	Advisor for Minor Research Project	4 credits; compulsory elective course Choose either K602 or K603.
K603	Advanced Research in Knowledge Science B2(Internship)	Advisor for Internship	

5 Programs for career plans

There are four educational programs at JAIST. See the Institute-wide Study Guide, the section V.1 for the detailed information. The purpose of offering multiple programs is to help students realize their career goals by fostering a wide range of specialized knowledge and the ability to apply that knowledge while encouraging student ambition and providing useful experience.

M program
Mα program
3D program
5D program

Characteristics of each program are described below. For more information about course enrollment, supervision, and guidance on research in each program, see the sections **6 Master's program** (M・Mα programs and master's part of the 5D program) and **7 Doctoral program** (3D program and doctoral part of the 5D program).

5.1 M program

This program is a regular master's program for students who plan to obtain a master's degree in Knowledge Science in 2 years (standard period). Students who wish to seek employment after this 2-year program are encouraged to take the courses in the Institute of General Education. It is possible for the M program graduates to proceed to the doctoral (3D) program.

5.2 Mα program

This program is designed for students who have a background in other disciplines or wish to study at a slower pace from the basic level and obtain a master's degree in Knowledge Science. These students need to complete more of the Introductory courses and the IGE courses than those for the M program to acquire fundamental knowledge and skills. The students are also required to complete the Technical courses before they begin their research project. Because of this, the period of the Mα program is 3 years. However, it is possible to complete this program in a shorter period, such as 2 years and 3 months, 2 years and 6 months, or 2 years and 9 months, according to the students' plans. JAIST regards the chosen period as a standard program period for the student. As long as students complete the program within their approved terms, the tuition will be charged only for 2 years.
Students can also complete the Mα program in 2 years, if their research progresses faster than their initial plans. The Mα graduates are also eligible to apply for the 3D program.

5.3 3D program

The 3D program is designed for students who completed the M or Mα program at JAIST, those who completed a master's program at other universities, or working professionals who possess a master's degree and who wish to obtain a doctoral degree in Knowledge Science. The purpose of this program is to foster highly professional engineers and advanced scientists capable of contributing to society using their practical skill to identify and solve problems through scientific and technological analysis. The standard period of the 3D program is 3 years.
Students must choose one of two tracks; **type E** for future engineers with doctoral degrees in business and **type S** for advanced scientists at universities or research institutions, are offered in this program. The education, research, and guidance systems have been organized according to students' future career goals.

5.4 5D program

The 5D program is for those who plan to obtain a doctoral degree from the start of the master's program through the consecutive course of the master's and doctoral programs at JAIST. The purpose of this program is to foster highly professional engineers and advanced scientists capable of contributing to society using their practical skills to identify and solve problems through scientific and

technological analysis.
Students must choose one of two tracks; **type E** and **type S** as explained in 5.3.

6 Master's program (M·Mα programs and master's part of the 5D program)

The following sections indicate general requirements and rules common to all programs, if not otherwise specified. The specifics of each program are described separately.

6.1 Guidelines for taking courses

See the section VI.2 in the Institute-wide Study Guide for the necessary procedures.

6.1.1 Course requirements

Students must first read the section VI.1.1 for the requirements to complete a program. Regarding the section VI.1.1(2), follow the instructions below. Check the Institute-wide Study Guide for information regarding taking the IGE courses, courses from other schools at JAIST or ones at other institutes. The 5D program students must also see the section 6.1.2.

A. When students choose a master's thesis as a major research project, they need:

(1) 8 credits from Seminar in Knowledge Science A (Thesis).
(2) 2 credits from Research in Knowledge Science A (Minor Research Project).
(3) 20 credits (10 courses) or more in addition to (1) and (2) above.
These 20 credits must contain the following credits and courses:
- 8 credits (4 courses) or more from the Basic courses, which must contain 4 credits (2 courses) or more from K228-230 (K228 must be included)
- 2 credits (1 course) or more from the Technical courses not including E413 Scientific Discussions II and B411 Advanced Project Management.
- 16 credits (8 courses) or more in total including those mentioned above from the KS school courses in 3 areas.

Note that up to 3 completed courses from the Introductory courses can be counted to fulfill the requirements for the master's program.

B. When students choose a project report as a major research project, they need:

(1) 2 credits from Seminar in Knowledge Science A (Project Report).
(2) 2 credits from Research in Knowledge Science A (Minor Research Project).
(3) 26 credits (13 courses) or more in addition to (1) and (2) above.
These 26 credits must contain the following credits and courses:
- 10 credits (5 courses) or more from the Basic courses, which must contain 4 credits (2 courses) or more from K228-230 (K228 must be included).
- 4 credits (2 courses) or more from the Technical courses not including E413 Scientific Discussions II and B411 Advanced Project Management. .
- 22 credits (11 courses) or more from the KS school courses in 3 areas.

Note that up to 4 completed courses from the Introductory courses can be counted to fulfill the requirements.

6.1.2 Requirements for continuing on to the doctoral program as a 5D program student

Every 5D program student must satisfy all the requirements for the master's program completion described in the section 6.1.1 AND the following:

(1) At least 18 credits (9 courses) must be obtained from the KS school courses. Only 2 credits from the Introductory courses can be included in the 18. When the number of credits from the Basic, Technical and Advanced courses exceed 10 (5 courses), the excess of up to 8 credits (4 courses) can be transferred and recognized as credits earned in the doctoral program. For details concerning the application for transfer of credits, see the Institute-wide Study Guide, the section VI.6.

(2) At least 4 credits (2 courses) or more must be from the IGE courses.
(3) One of the following 3 conditions of English proficiency:
    i) Those who have successfully completed the intermediate level English courses (E211-422).
    ii) Those who took the TOEIC within 2 years prior to their application for admission and scored higher than the score required by the school.
    iii) Those who have submitted a master's thesis or project report in English and passed the exam.

6.2 Research supervision and guidance

6.2.1 Laboratory assignment and supervisor

See the Institute-wide Study Guide, the section VII.1 for the laboratory assignment. See also the section VII.3 for the multiple supervisory system. In the KS school an acting (temporarily assigned) supervisor will generally be assigned as a second supervisor.

6.2.2 Research project

Research projects consist of both major and minor projects. A supervisor will give guidance on a major research project and the advisor for Minor Research Project will give guidance on a minor research project.

A major research project will focus on a subject in which a student and a supervisor share an academic interest. The student writes a master's thesis or project report on his/her research.

Through a minor research project, students broaden their horizons and develop multiple perspectives by acquiring fundamental concepts, knowledge, and abilities or by collaborating on subjects within their advisor's area.

It is possible for 5D program students to write a master's thesis or conduct a master's research project based on the research, which would be a part of their research in the doctoral program.

6.2.3 Major research project (for a master's thesis or project report)

(1) Students are required to choose whether to write a master's thesis or conduct a master's research project after consultation with their supervisor. Then they must draw up a research proposal for their master's thesis or master's research project report and submit it to the dean via the Educational Service Section, Educational Affairs Department (hereinafter "Kyoumu") by the specified deadlines [see (2) below]. Note that if the submission of a research proposal is delayed, the completion will be delayed.

(2) Deadline for a research proposal

M or 5D program: The last month of their 1st year (the end of March for April students, or the end of September for October students)

Mα program: 1 year before the planned date of completion

(3) Prerequisites for submitting a research proposal

The followings are the prerequisites to submit a research proposal.

- Students must have successfully completed 3 Basic courses, including 1 course from K228–230.
- The contents of the research proposals must be acceptable.

(4) Beginning of research

Students can formally begin their major research just after their research proposal is accepted and approved by their 3 advisors and submitted to Kyoumu.

(5) Length of a research period

1 year at the earliest is required to complete the major research project. Therefore, if the research proposal is not accepted by the deadline mentioned above (2), it is not possible to complete the program within each standard period.

(6) Mid-term examination and the final defense

Students must present the current progress and results of their major research project at the mid-term examination 6 months before they plan to graduate, which will be examined by 4

faculty members. Students must present their major research project at the final defense 1 month before they plan to graduate.

(7) Notes
- Students must fulfill the prerequisites to submit a research proposal. Students are responsible for ensuring that they have met all the prerequisites [see the section 6.2.4].
- Students should also be aware that their advisor for Minor Research Project must be assigned before submitting a research proposal [see the section 6.2.4].
- The form of a research proposal for 5D program students is of the same type as an application form for the program of “Research Fellowship for Young Scientists (Doctoral Course Students)” by the Japan Society for the Promotion of Science (JSPS), which is different from that of the M and Mα program.
- It is advisable for students to decide a research theme as early as possible and to conduct a bibliographic review in consultation with their supervisor. Many reviews on the research theme are indispensable before a good research proposal can be written.

6.2.4 Minor research project

(1) Students must consult with faculty members from an area outside their major area, find one who will assume the role of an advisor for Minor Research Project, and choose a research theme. They must submit the theme and the name of the advisor to Kyoumu by the beginning of December in their 1st year for the April students, or of June for the October students. Then, students can conduct their minor research project under the guidance of their advisor.

(2) It is advisable for students to begin the project shortly after submission of a research theme.

(3) In general, the project should be finished within 2 months.

(4) Notes
- Students should be aware that an advisor for Minor Research Project must be chosen and approved by a faculty meeting before submitting a research proposal.
- Students can conduct group work as a method of research. They are allowed to conduct group work in the following two cases:
  - When a student recruits several other students with the same interests and find an advisor for a minor research project.
  - When an advisor proposes group work for a minor research project and recruits members.

Each student must write a report to obtain credits (K202 Research in Knowledge Science A) based on the advisor’s evaluation of the individual member’s reports on group work. They may be asked to write additional reports as a group.

6.3 Degree conferment

See the Institute-wide Study Guide, the section VIII.1 for the detailed information.

6.3.1 Schedule pertaining to conferment of degree and procedures

		March completion	June completion	September completion	December completion
Research proposal (for master's thesis or project report)	**Prerequisite**	・ Students must have completed at least 3 Basic courses (including 1 course from K228-230). ・ Proposal contents must be acceptable.			
	Submission period	By the end of March of the previous year	By the end of June of the previous year	By the end of September of the previous year	By the end of December of the previous year
Submission of report on minor research project		By the end of March of the previous year	By the end of June of the previous year	By the end of September of the previous year	By the end of December of the previous year
Application for degree and defense		The end of January	The end of April	The end of June	The end of October
Submission of thesis or project report		Early February	Early May	Early August	Early November
Oral defense of thesis or project report		Mid-February	Mid-May	Late August	Mid-November
Conferment of degree		March	June	September	December

6.4 Assignment and change of program, and shortening of period

Students will be assigned to 1 of the 3 programs, M, Mα or 5D(in October for the April students and in March for the October students). The assignment is decided according to their career plans, background, academic grades in the 1st term after enrollment (Term 1-1 for April students, or Term 2-1 for October students) and English proficiency (scores of TOEFL or TOEIC, etc.).

Students may be approved to change their program from the M program to the 5D program only in their 1st year after having the course grades evaluated by the faculty. Students can apply for program change from 5D to M anytime. Any other program change is not allowed. Contact Kyoumu if they wish to change.

The Mα students are allowed to shorten their approved completion period only at the time of submission of the research proposal. It may be approved without any interview or examination if it can be expected that the students are able to complete the program within a year. Note that once it is approved, it cannot be changed.

6.5 Other

6.5.1 Assistance and recommendation for employment

Recommendation for employment can only be given if students:

(1) have obtained 12 credits or more from the Introductory, Basic, and Technical courses including compulsory courses.
(2) have obtained 4 credits or more credits from IGE courses.
(3) have had their research proposal on a master's thesis/project report accepted.
(4) have taken the SPI (Synthetic Personality Inventory) examination twice or more at JAIST.

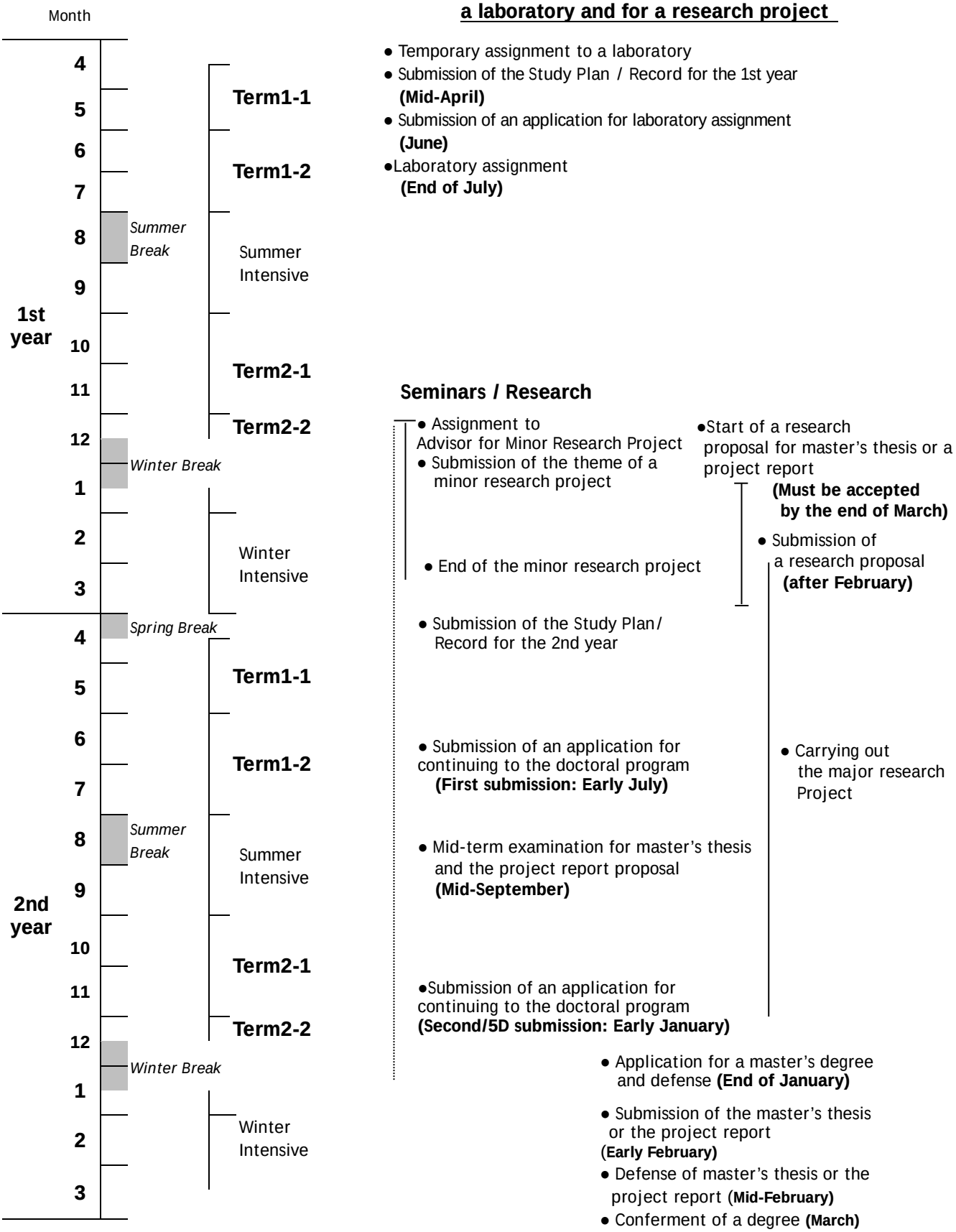
Note if students do not meet (2) but have at least 16 course credits in total, they might be considered as satisfying (1) and (2).

6.5.2 Continuing on to the doctoral program

See the section IX.2 in the Institute-wide Study Guide.

6.5 Master's program schedule

The following is a standard schedule for students enrolling in April and intending to complete the program in 2 years.



7 Doctoral program (3D program and doctoral part of the 5D program)

The following sections indicate general requirements and rules common to all programs, if not otherwise specified. The specifics of each program are described separately.

7.1 Guidelines for taking courses

See the Institute-wide Study Guide, the section VI.2 for the guidelines and the necessary procedures to take courses.

7.1.1 Course Requirements

Students must first read the section VI.1.2 for the requirements to complete the program. Regarding the section VI.1.2 (2), follow the instructions below. Check the Institute-wide Study Guide for information regarding taking the IGE courses, courses from other schools at JAIST or ones at other institutes. **Students need to obtain:**

(1) 6 credits from the Advanced Seminar in Knowledge Science B (Major Research Project)
(2) 4 credits from Advanced Research in Knowledge Science B1 (Minor Research Project) or Advanced Research in Knowledge Science B2 (Internship)
(3) 10 credits (5 courses) or more from the Advanced courses in 2 of the 3 areas
(4) The courses from the Basic and Technical courses which students did not take in the master's program will be considered as those of the Advanced in the same area if they are taken during the doctoral program and the credits can be counted for program completion requirements. But at least one course (2 credits) from the Advanced courses (K6xxx) must be completed during the doctoral program and be included. If 5D program students have already completed 18 credits (9 courses) from the KS school courses in the master's program, taking one more KS course (2 credits) excluding K601, K602, and K603 during the doctoral program will satisfy required number of credits. Students must apply for credit transfer as specified in the section VI.6. Students are strongly encouraged to make sure that they meet all of the above specified doctoral degree requirements.

7.2 Research supervision and guidance

7.2.1 Laboratory assignment and supervisor

See the Institute-wide Study Guide, the section VII.1 for the laboratory assignment. See also the section VII.3 for the multiple supervisory system. In the KS school a second supervisor will be chosen from the same research area as a supervisor.

7.2.2 Research project and internship

Research projects consist of major and minor projects. A supervisor will give guidance on a major research project and an advisor for Minor Research Projects will give guidance on a minor research project.

A major research project will focus on a subject in which a student and a supervisor share an academic interest to write a doctoral dissertation. Through minor research projects students broaden their horizons and develop multiple perspectives by acquiring fundamental concepts, knowledge, and abilities or by collaborating on subjects within their advisor's area.

Students in the 5D program can carry out research as a minor research project at a graduate school or research institute abroad. In order to do this, students must be accepted by an outside advisor who has sufficient expertise to give guidance. They must maintain close contact with their supervisors and outside advisors for evaluation.

Students who wish to choose an internship instead of working on a minor research project must conduct an internship under their advisor's guidance. The period of an internship should be longer than 3 months.

7.2.3 Major research project

(1) Students must draw up a research proposal for their doctoral dissertation and submit it to Kyoumu after consultation with their supervisor.

(2) Deadline for a research proposal
A research proposal must be submitted at the latest 1 year after the student's enrollment in the doctoral program.

(3) Prerequisite for submitting research proposals
The content of research proposals must be acceptable.

(4) Beginning of research
Students can formally begin their major research project right after their research proposal is accepted and approved by their 3 advisors and submitted to Kyoumu.

(5) Dissertation outline
After their 3 advisors have reviewed the dissertation outline, students must submit it at least 6 months before submitting an application for degree (see the section 7.3.1) to Kyoumu.

(6) Fast-track degree
After consultation with their supervisor, students who wish to fast-track their studies must apply to the dean via their supervisor, and submit a dissertation outline earlier than the standard submission time.

(7) Notes
The 3D program students who have not decided a research theme for their major research project before enrolling in the doctoral program should choose one as early as possible. Students are expected to consult with their supervisor, choose a theme and conduct a bibliographic review while fulfilling course requirements. Many reviews on the research theme are indispensable before a good research proposal can be written.

7.2.4 Minor research project

(1) Students must consult with faculty members in an area outside their major area, find a faculty member who will assume the role of an advisor for Minor Research Project, and choose a project theme. Students must submit a theme and a name of an advisor to Kyoumu. Then, students can conduct their minor research project under the guidance of their advisor. If a research topic of a minor research project does not overlap with a major research project, students may choose an advisor for a minor research project in the same area as the supervisor's.

(2) Students can receive guidance for a minor research project from an outside advisor such as visiting professors or professors at other universities. Students must consult with their supervisor first and take appropriate procedures. They must also maintain close contact with their supervisors throughout the project.

(3) Notes
- It is advisable for students to begin a project as early as possible and to finish in their 1st year.
- As doctoral students are expected to present their research results at conferences and to publish articles in as many occasions as possible to accrue research achievements. Students are encouraged to present a minor research project report at conferences and submit it as an article for publication in refereed academic journals.
- Students can conduct a minor research project as group work

* When a student recruits several students with the same interests and find an advisor for minor research projects.

*When an advisor proposes group work for a minor research project and recruits members.

Each student must write a thesis to obtain credits (K602) based on the group work. They may be asked to write an additional thesis as a group.

7.2.5 Internship

(1) Internships are conducted at companies etc. for a period longer than 3 months.
(2) Students who wish to apply for internships must find a faculty member who will assume the role of an advisor for Internship in consultation with their supervisor. Students must submit a document to the Career Support Section.
(3) An internship and submission of a report must be completed before submitting an application for preliminary defense. Students must submit a work report with an evaluation from the company attached to their advisor for Internship when they finish an internship.

7.2.6 Grant for off-campus research and internship

Students are encouraged to carry out advanced research at other research institutions abroad or in Japan or to do an internship at companies to fulfill their career goals. Leading companies, excellent regional companies, public offices, NPOs and NGOs are recommended for an internship venue. Detailed information regarding financial support for this, see *HANDBOOK for Students*.
When the off-campus activity is approved as a minor research project, students may earn credits for K602 Advanced Research in Knowledge Science B1. When the off-campus activity is approved as an internship, students may earn credits for K603 Advanced Research in Knowledge Science B2. Other activities are regarded as part of the major research project and students can earn credits of K601 Advanced Seminar in Knowledge Science B. An application form must be submitted at least two months before the start of these activities.
See the Institute-wide Study Guide, the section VII.4 for the necessary procedures.

7.3 Degree conferment

See the section VIII.2 in the Institute-wide Study Guide.

7.3.1 Schedule pertaining to conferment of degree and procedures

	March Completion	June Completion	September Completion	December Completion
Research proposal	Must be submitted within 1 year after enrolling in the doctoral program			
Minor research project thesis	Must be submitted to the advisor for Minor Research Project before submission of the application for preliminary defense			
Dissertation outline	Early July of the previous year	Early October of the previous year	Early January	Early April
Application for preliminary defense	Early October of the previous year	Early January	Early April	Early July
Preliminary defense	Middle of December of the previous year	Middle of March	Middle of June	Middle of September
Application for degree	Early January	Early April	Early July	Early October
Formal hearing, oral defense, final examination	Early February	Early May	August	Early November
Conferment of degree	March	June	September	December

7.4 Career track choice

3D program students must choose one of the two tracks, type E or S, based on their wishes at the time of enrollment. 5D program students can decide their track anytime after their laboratory assignment before the submission of the research proposal in the master's program.

7.5 Doctoral program schedule toward degree completion

The following table shows a standard schedule for the doctoral students enrolled in April who plan to complete their program in 3 years.

Category	Submitted to / Note	Period
Research proposal	The dean via Kyoumu	By the end of March in their 1st year
Advisor for minor research project or internship	Kyoumu (Title of a minor research project or Application for Internship)	By the end of March in their 1st year
Completion of minor research project or internship		Must be completed before the submission of application for preliminary defense
Dissertation outline	Kyoumu	By early July in their 3rd year
Application for preliminary defense	Kyoumu (Titles of a dissertation and main publication)	Early October
Dissertation draft	Should be distributed to 5 or more members of the Doctoral Dissertation Preliminary Examination Committee	At least 2 weeks before the preliminary defense
Preliminary defense		By Mid-December
Application for degree, Doctoral dissertation and abstract	Kyoumu (with the dissertation and abstract) After a successful preliminary defense	Early January
Formal hearing, oral defense and final examination		Early February
Submission of dissertation and abstract	Kyoumu (formatted as instructed by JAIST) After a successful oral defense	By the degree conferment day
Conferment of degree		Late March

8 Education program for leaders in data analytics

Data-driven approach is playing more important role in most sciences and in solving social problems, and educating leaders with more knowledge and skill of data processing is necessary. In order to meet such social needs, the KS school has established a new education program specialized in data analytics based on knowledge science.

This program aims at producing excellent industry-ready talents in various organizations, such as business enterprises, think-tanks, public agencies, NPOs, NGOs, and research institutes, through cultivating abilities to comprehend social and business needs, to solve various social problems with making full use of data in collaboration with specialists, and to coordinate such collaborative works.

8.1 Eligible students for the program

KS students who enrolled in April, 2014 or later in the Ishikawa campus.

8.2 Application procedures

Students who wish to join this program must submit an application form to Kyoumu in June for the April students and in December for the October students. The application will be evaluated at the faculty meeting and the application results will be decided.

Students can take the designated courses for this program even if they are not in the program.

8.3 Program completion requirements

In order to complete this program, students must satisfy the following requirements.

(1) Master's students must finish 3 courses (6 credits) or more from the list below.
(2) Doctoral students must finish the following 3 courses, K236, K417 and K619.

The Courses designated for this program

Course Number	Course Title	Credit
K112	Basic Mathematics for Data Analytics	2
K236	Basis of Data Analytics	2
K417	Data Analytics	2
K619	Advanced Data Analytics	2

8.4 Certificate of completion

A certificate of completion will be awarded to the students after completion of the master's/doctoral program.

9 Courses at other graduate institutions

See the section VI.7 in the Institute-wide Study Guide.

School of Information Science

School of Information Science

How to use this guidebook

Students in the School of Information Science must read both parts of the Institute-wide Study Guide and this guide for the IS students carefully and thoroughly. This guide contains an outline of the school in the section 1. If you are a master's student, please read the sections 1, 2, 3, 4, 5, 6, 7 and 8. If you are a doctoral student, please read the sections 1, 2, 3, 4, 9 and 10. If anything is not clear, please consult the Educational Service Section, Educational Affairs Department (hereinafter "Kyoumu").

1 Outline of the school

1.1 Outline of the school

Today's society is experiencing dramatic change and progress caused by the rapid expansion of information technology, the general principle of which is to represent and transform information and knowledge. This information-oriented society is expected to continue developing, and a new world whose principal activities are the production and processing of information is burgeoning. The mission of the School of Information Science is to provide a superb education and research environment that will promote cutting-edge research while training future scientists and engineers capable of serving as leaders in this new information-oriented society.

The school consists of 5 areas and is pursuing research and education as follows:

A. Theoretical Information Science

Education and research on the theoretical foundations of computer science, including mathematical logic, algorithms, theory of systems, and information security.

B. Human Information Processing

Education and research on human perception systems, including vision and auditory information processing, robotics, and computer simulation.

C. Artificial Intelligence

Education and research on computational models of human intelligence, including natural language processing, computational human reasoning, and game informatics.

D. Computer Systems and Networks

Education and research on computer architecture, LSI, parallel processing, networks, and ubiquitous networks.

E. Software Science

Education and research on reliable software, including software modeling, software design, and formal methods.

Dean: Professor Hiroyuki Iida

Number of students

	Master's program	Doctoral program
Department of Information Science	126	37

2 Faculty profiles

◇ School of Information Science

	Name	Position	Specialization
Area: Theoretical Information Science			
	Field: Mathematical Logic		
	ISHIHARA, Hajime	Professor	Mathematical Logic, Constructive Mathematics
	NEMOTO, Takako	Assistant Professor	Mathematical Logic
	Field: Theory of Algorithms		
	UEHARA, Ryuuhei	Professor	Computational Complexity, Graph Algorithms
	OTACHI, Yota	Assistant Professor	Graph Algorithms, Parameterized Complexity
	Field: Systems Science		
	HIRAISHI, Kunihiko	Professor	Formal Modeling and Analysis of Concurrent Systems
	Field: Information Security		
	MIYAJI, Atsuko	Professor	Information Security, Cryptology, Secure Modeling
	OMOTE, Kazumasa	Associate Professor	Information Security, Network Security
	SU, Chunhua	Assistant Professor	Cryptography, RFID Security & Privacy, Privacy-Preserving Data Mining
	CHEN, Jiageng	Assistant Professor	Information Security
	SOMEMURA, Yo	Research Professor	Environmental Management, Environmental Accounting, LSI Lithography
	FUTA, Yuichi	Research Associate Professor	Information Security, Cryptographic & Number-theoretic Algorithm
	TANAKA, Satoru	Research Assistant Professor	Number theory, Number theoretic algorithms
Area: Human Information Processing			
	Field: Biological Information Processing		
	Dang, Jianwu	Professor	Mechanism of Speech Production, Cognitive Science of Speech, Speech Production and Perception
	TANAKA, Hirokazu	Associate Professor	Computational Neuroscience, Biomedical Signal Processing, Psychophysics
	SUEMITSU, Atsuo	Assistant Professor	Memory Mechanism, Neural Network
	Field: Acoustic Information Processing		
	AKAGI, Masato	Professor	Modeling of Auditory Mechanisms of Humans, Speech Signal Processing
	UNOKI, Masashi	Associate Professor	Auditory Scene Analysis, Speech Signal Processing, Speech Intelligibility Improvement
	MIYAUCHI, Ryota	Assistant Professor	Auditory perception, Experimental psychology, Acoustics
	MORIKAWA, Daisuke	Assistant Professor	Acoustic engineering, Psychoacoustics
	Field: Image Information Processing		
	KOTANI, Kazunori	Associate Professor	Computer Imaging, Picture Coding, Human Interface
	YOSHITAKA, Atsuo	Associate Professor	Multimedia Retrieval, Image Retrieval, Human-centric Information Processing
	CHEN, Fan	Assistant Professor	Pattern Recognition, Image Processing, Video Analysis
	Field: Robotics		
	CHONG, Nak-Young	Professor	Human-Friendly Robot Systems, Network Robot, Humanoid Robot
	ASANO, Fumihiko	Associate Professor	Control Engineering, Dynamic of Machinary, Legged Robots
	JEONG, Sungmoon	Assistant Professor	Bio-inspired Intelligent Systems, Intelligent Signal Processing and Pattern Analysis
	RYU, Hyejeong	Research Assistant Professor	Multi-sensor fusion algorithm, autonomous navigation for mobile robots
	Field: Computational Engineering and Science		
	MAEZONO, Ryo	Associate Professor	High Performance Computing on Quantum Many-body systems
	HONGO, Kenta	Assistant Professor	Quantum Simulation, Massively Parallel Statistical Processing
Area: Artificial Intelligence			
	Field: Natural Language Processing		
	SHIRAI, Kiyoaki	Associate Professor	Natural Language Processing, Knowledge Acquisition, Machine Learning
	Field: Knowledge Engineering		
	TOJO, Satoshi	Professor	Formal Semantics of Natural Language, Logic Programming
	NGUYEN, Minh Le	Associate Professor	Satatistical Natural Language Processing, Machine Translation, Language Understanding
	SANO, Katsuhiko	Assistant Professor	Logic and its Application to Formal Semantics
	Field: Entertainment Informatics		
	IIDA, Hiroyuki	Professor	Game Informatics, Entertainment Science
	IKEDA, Kokolo	Associate Professor	Game Informatics, Evolutionary Algorithm, Machine Learning
	VIENNOT, Simon Robert Michel	Assistant Professor	Game tree search, Combinatorial game theory, Machine learning
	HASEGAWA, Shinobu[*1]	Associate Professor	Support System for Intellectual Learning, Learning Management System

Area: Computer Systems and Networks			
	Field: Computer Architecture		
	INOGUCHI, Yasushi[*1]	Professor	Parallel Processing, Hardware and Algorithm
	TANAKA, Kiyofumi	Associate Professor	Processor Architecture, Parallel and Distributed Systems, Embedded Systems
	Field: Integrated Systems		
	KANEKO, Mineo	Professor	Integrated Circuit Design, Circuit System Theory
	ZHANG, Renyuan	Assistant Professor	Circuit system theory, Mixed Analog/Digital LSI Circuits design
	Field: Information Networks		
	TAN, Yasuo	Professor	Computer Network, Ubiquitous Computing
	SHINODA, Yoichi[*1]	Professor	Information Environment, Distributed and Parallel Computing
	SHIKIDA, Mikifumi[*1]	Professor	Groupwares, Software Development Environment
	LIM, Yuto	Associate Professor	Wireless Communication, Heterogeneous, Power Control, Congestion Control, Experimental Verification
	UDA, Satoshi[*1]	Assistant Professor	Internet, Routing, Traffice Engineering
	Field: Ubiquitous Communications		
	MATSUMOTO, Tadashi	Professor	Information Theory, Wireless Communications, Turbo Algorithm
	KURKOSKI, Brian Michael	Associate Professor	Information Theory, Coding Theory, Coding for Data Storage
	KHOIRUL, Anwar	Assistant Professor	Information Theory, Wireless and Mobile Communication, Turbo Equalization
	SAITO, Yasuhiro[*2]	Research Professor	Information and Communications Policy
	OKADA, Takashi	Research Associate Professor	Multi-Agent Simulation
Area: Software Science			
	Field: Software Structure		
	SUZUKI, Masato	Associate Professor	High-reliability Software Systems, Software Airchitechture
	Field: Formal Methods for Software Development		
	OGATA, Kazuhiro	Professor	Software Engineering, Formal Methods, Verification
	FUTATSUGI, Kokichi[*3]	Research Professor	Software Engineering, Formal Methods, Language Design
	AOKI, Toshiaki	Associate Professor	Software Engineering/Science, Formal Methods, Embedded System Developments
	CHIBA, Yuki	Assistant Professor	Term Rewriting Systems, Automated Theorem Proving
	GAINA, Daniel Mircea[*3]	Assistant Professor	Formal Methods and Abstract Model Theory
	Field: Software Verification		
	OGAWA, Mizuhito	Professor	Automatic Deduction, Formal Proof, Program Analysis, Program Verification
	HIROKAWA, Nao	Associate Professor	Computational Model, Term Rewriting Systems
	YOKOYAMA, Keita	Assistant Professor	Mathematical Logic, Reverse Mathematics
	Field: Dependable Systems		
	TERAUCHI, Tachio	Professor	Programming Languages, Program Verification, Program Analysis, Computer Security
	KISHI, Tomoji	Visiting Professor	Product Line Software Engineering
	DEFAGO, Xavier	Associate Professor	Distributed Systems, Distributed Algorithms, Fault-tolerance
	BONNET, Francois Pierre Andre	Assistant Professor	Distributed Algorithms, Distributed Computability, Robot Computing
	PREINING, Norbert[*3]	Associate Professor	Mathematical Logic, Fuzzy Logic, Formal Methods, Verification
	Tomita, Takashi[*1]	Assistant Professor	Formal methods, Quantitative verification, Model checking, Program synthesis

***1** The menber belongs to the Research Center for Advanced Computing Infrastructure.
***2** The menber belongs to the Dependable Network Innovation Center.
***3** The menber belongs to the Research Center for Software Verification.

◇ Visiting chairs

Name	Position	Specialization
Computational Linguistics		
HU, Zhenjiang	Visiting Professor	
WATANABE, Osamu	Visiting Professor	
Cognitive Science		
WAKABAYASHI, Kazutoshi	Visiting Professor	
Parallel and Distributed Systems		
CHO, Kenjiro	Visiting Professor	
WATANABE, Katsuya	Visiting Professor	

◇ Chairs operated jointly with research institutes and/or companies

Name	Position	Specialization
Information and Knowledge Integrated Processing (Fujitsu)		
MATSUTSUKA, Takahide	Visiting Professor	
YUGAMI, Nobuhiro	Visiting Associate Professor	
Ultra-High Speed Communication Network Construction (National Institute of Information and Communications Technology)		
IMASE, Makoto	Visiting Professor	
HARAI, Hiroaki	Visiting Associate Professor	
Distributed Information Processing (National Institute of Advanced Industrial Science and Technology)		
ONISHI, Masaki	Visiting Associate Professor	
YAMASHITA, Tomohisa	Visiting Associate Professor	
Advanced Software Engineering (National Institute of Informatics)		
HONIDEN, Shinichi	Visiting Professor	
YOSHIOKA, Nobukazu	Visiting Associate Professor	
Information Science Chair Cooperated with Vietnam FIVE Institutes*		
LE, Bac Hoai	Visiting Associate Professor	
Green ICT (NTT Energy and Environment Systems Laboratories)		
NAKAMURA, Masayuki	Visiting Professor	
NAKAMURA, Jiro	Visiting Professor	
Thai Information Science (Thammasart University, NECTEC)		
THEERAMUNKONG, Thanaruk	Visiting Professor	
WUTIWIWATCHAI, Chai	Visiting Associate Professor	
SUNTISRIVARAPORN, Boontawee	Visiting Associate Professor	
Tianjin Information Science (Tianjin University)		
ZHANG, Jiawan	Visiting Professor	
LI, Xiaohong	Visiting Professor	
LIU, Baolin	Visiting Professor	

* FIVE Institutes indicate University of Science, Vietnam National University-Ho Chi Minh City (HCMUS), University of Technology, Vietnam National University-Ho Chi Minh City (HCMUT), Institute of Information Technology, Vietnamese Academy of Science and Technology (IOIT, VAST), Hanoi University of Science and Technology (HUST), Vietnam National University, University of Engineering and Technology (VNU-UET).

◇ Endowed chairs

Name	Position	Specialization
Cyber Range Organization and Design		
CHINEN, Ken-ichi	Research Associate Professor	Wide-area Information Distribution, Network Topology
BEURAN, Razvan Florin	Research Associate Professor	Network Systems, Performance Evaluation, Information Processing

◇ Dependable Network Innovation Center

Name	Position	Specialization
MIYAKAWA, Shin	Visiting Professor	

3 Class schedule for 2015-2016

Term 1-1 (April 8 – June 5)

School of Information Science

	1 9:20-10:50	2 11:00-12:30	3	4 15:10-16:40	5 16:50-18:20
Mon.	I119 Statistics in Information Science **(Akagi・[Morikawa])** I235 Game Informatics **(Ikeda・Iida・[Viennot])** I236 Logical Inference and Knowledge Representation **(Tojo)** I655E Modern Quantum and Neural Computation **(H.Tanaka・Maezono)**	I115 Digital Logic and Computer Design **(Kaneko・Inoguchi)** I216E Computational Complexity and Discrete Mathematics **(Uehara・Miyaji・[J.Chen])** I225E Statistical Signal Processing **(H.Tanaka)** I450 Network Design Laboratory **(Tan・Chinen)**	Office Hours (13:30 ~ 15:00)	G212 Writing and Presentation Skills **(Tsuji)** G213E Japan Studies **(Kawanishi)**	L211 Logic and Mathematics **(Preining)** L212E History and Philosophy of Science **(Mizumoto)** L214 A Methodology for Innovation Design **(Kunifuji, etc.)**
Tue.	I116 Programming Laboratory I **(Omote・[J.Chen]・[Su])** I120 Fundamentals of Logic and Mathematics **(Terauchi)** I233 Operating Systems **(Shinoda)** I447E Database Systems **(Ogawa・ Marukawa)**	I114 Fundamental Mathematics for Information Science **(Preining)** I118 Graphs and Automata **(Tojo)** I211E Mathematical Logic **(Ogawa)** I212 Analysis for Information Science **(Kotani)**		E011 Interaction Seminar 1 E111 Basic TC 1 E211 Intermediate TC 1 E213 Scientific Discussions 1 J011A Introductory Technical Japanese 1 J111A Basic Technical Japanese 1 J211 Intermediate Technical Japanese 1 J411 Advanced Technical Japanese 1	E021 Interaction Seminar 2 E113 Basic TC 3 E212 Intermediate TC 2 E411 Advanced TC 1 J011B Introductory Technical Japanese 1 J111B Basic Technical Japanese 1
Wed.	I111 Algorithms and Data Structures **(Uehara)** I112 Computer Systems **(Yoshitaka)** I214 System Optimization **(Kaneko・Hiraishi)** I218 Computer Architecture **(K.Tanaka)**	I119 Statistics in Information Science **(Akagi・[Morikawa])** I235 Game Informatics **(Ikeda・Iida・[Viennot])** I236 Logical Inference and Knowledge Representation **(Tojo)** I655E Modern Quantum and Neural Computation **(H.Tanaka・Maezono)**		G212 Writing and Presentation Skills **(Tsuji)** G213E Japan Studies **(Kawanishi)**	L211 Logic and Mathematics **(Preining)** L212E History and Philosophy of Science **(Mizumoto)** L214 A Methodology for Innovation Design **(Kunifuji, etc.)**
Thu.	I115 Digital Logic and Computer Design **(Kaneko・Inoguchi)** I216E Computational Complexity and Discrete Mathematics **(Uehara・Miyaji・[J.Chen])** I225E Statistical Signal Processing **(H.Tanaka)** I450 Network Design Laboratory **(Tan・Chinen)**	I116 Programming Laboratory I **(Omote・[J.Chen]・[Su])** I120 Fundamentals of Logic and Mathematics **(Terauchi)** I233 Operating Systems **(Shinoda)** I447E Database Systems **(Ogawa・ Marukawa)**		E011 Interaction Seminar 1 E111 Basic TC 1 E211 Intermediate TC 1 E213 Scientific Discussions 1 J011A Introductory Technical Japanese 1 J111A Basic Technical Japanese 1 J211 Intermediate Technical Japanese 1 J411 Advanced Technical Japanese 1	E021 Interaction Seminar 2 E113 Basic TC 3 E212 Intermediate TC 2 E411 Advanced TC 1 J011B Introductory Technical Japanese 1 J111B Basic Technical Japanese 1
Fri.	I114 Fundamental Mathematics for Information Science **(Preining)** I118 Graphs and Automata **(Tojo)** I211E Mathematical Logic **(Ogawa)** I212 Analysis for Information Science **(Kotani)**	I111 Algorithms and Data Structures **(Uehara)** I112 Computer Systems **(Yoshitaka)** I214 System Optimization **(Kaneko・Hiraishi)** I218 Computer Architecture **(K.Tanaka)**			

Irregular class schedule:

I465S Literacy in Information Security Management (Miyaji・Futa):
Dates to be announced (5th period of Tuesday or Friday afternoons in Terms 1-1, 2-1 and 2-2)

NOTE:

- The first class of B101 will be held on Wednesday, April 8. The second and subsequent classes of B101 will be held in Term 1-2.
- All lectures except B101 in this term will start on Thursday, April 9 and the day will follow the WEDNESDAY schedule.
- Friday, June 5 will follow the MONDAY schedule.

Term 1-2 (June 10 – August 3)

School of Information Science

	1 9:20-10:50	2 11:00-12:30	3	4 15:10-16:40	5 16:50-18:20
Mon.	I213 Discrete Signal Processing **(Asano)** I217 Functional Programming **(Ogata)** I441 Advanced Computer Networks **(Shinoda)**	I226 Computer Networks **(Tan)** I234E Foundation of Software Environment **(Suzuki)** I442 Advanced System Software Laboratory **(Shikida)**		N008 Nano Quantum Device Materials (*) B101 Career Development Basic **(Kohda, etc.)** G211E Global Communication for Collaboration Building **(Kawanishi)**	N008 Nano Quantum Device Materials (*) B101 Career Development Basic **(Kohda, etc.)**
Tue.	I223E Natural Language Processing I **(Nguyen)** I438 Exercises on Graph Theory **(Kaneko)** I656E Logical Decision Procedures **(Preining･Hirokawa)**	I117E Programming Laboratory II **(Bonnet)** I219 Software Design Methodology **(Aoki･[Chiba])** I439 Speech Signal Processing **(Akagi･Dang)**		N006 Nano IT Materials (*) E011 Interaction Seminar 1 E112 Basic TC 2 E211 Intermediate TC 1 J012A Introductory Technical Japanese 2 J112A Basic Technical Japanese 2 J212 Intermediate Technical Japanese 2 J412 Advanced Technical Japanese 2	N006 Nano IT Materials (*) E021 Interaction Seminar 2 E113 Basic TC 3 E212 Intermediate TC 2 E412 Advanced TC 2 J012B Introductory Technical Japanese 2 J112B Basic Technical Japanese 2
Wed.	I232 Information Theory **(Matsumoto･Kurkoski)** I445E Distributed Systems **(Defago)** I483 Smart Embedded System Development **(T.Okada)** E413 Scientific Discussions 2 **(Blake)**	I213 Discrete Signal Processing **(Asano)** I217 Functional Programming **(Ogata)** I441 Advanced Computer Networks **(Shinoda)**	**Office Hours (13:30 ~ 15:00)**	N007 Nano Biodevice Materials (*) G211E Global Communication for Collaboration Building **(Kawanishi)**	N007 Nano Biodevice Materials (*)
Thu.	I226 Computer Networks **(Tan)** I234E Foundation of Software Environment **(Suzuki)** I442 Advanced System Software Laboratory **(Shikida)**	I223E Natural Language Processing I **(Nguyen)** I438 Exercises on Graph Theory **(Kaneko)** I656E Logical Decision Procedures **(Preining･Hirokawa)**		E011 Interaction Seminar 1 E112 Basic TC 2 E211 Intermediate TC 1 J012A Introductory Technical Japanese 2 J112A Basic Technical Japanese 2 J212 Intermediate Technical Japanese 2 J412 Advanced Technical Japanese 2	E021 Interaction Seminar 2 E113 Basic TC 3 E212 Intermediate TC 2 E412 Advanced TC 2 J012B Introductory Technical Japanese 2 J112B Basic Technical Japanese 2
Fri.	I117E Programming Laboratory II **(Bonnet)** I219 Software Design Methodology **(Aoki･[Chiba])** I439 Speech Signal Processing **(Akagi･Dang)**	I232 Information Theory **(Matsumoto･Kurkoski)** I445E Distributed Systems **(Defago)** I483 Smart Embedded System Development **(T.Okada)** E413 Scientific Discussions 2 **(Blake)**			

Irregular class schedule:

I466S Advanced Information Security Theory and Application (Miyaji･Futa･[S.Tanaka]･[J.Chen]･[Su]):
Dates to be announced (Friday afternoons in June-September)

I471S Project-based Learning of Information Security Practice (Miyaji･Futa･Omote･[S.Tanaka]･[J.Chen]･[Su]):
Dates to be announced (Friday afternoons in June-September and two days in September for intensive work)

NOTE:

･ * N00x courses will be offered by the faculty of Center for Nano Materials and Technology and School of Materials Science.

Term 2-1 (October 7 – December 2)

School of Information Science

	1 9:20-10:50	2 11:00-12:30	3	4 15:10-16:40	5 16:50-18:20
Mon.	I218E Computer Architecture **(Inoguchi)** I233E Operating Systems **(Defago)**	I223 Natural Language Processing I **(Shirai)** I235E Game Informatics **(Iida･[Viennot])** I465 Information Security **(Miyaji･Omote･[Su])**	**Office Hours (13:30 ~ 15:00)**	N001 Fabrication of Nano-Devices with Training Course(*) G212 Writing and Presentation Skills **(Tsuji)** G213E Japan Studies **(Kawanishi)**	N001 Fabrication of Nano-Devices with Training Course(*) L211E Logic and Mathematics **(Preining)** L212 History and Philosophy of Science **(Mizumoto)** L214E A Methodology for Innovation Design **(Kunifuji, etc.)**
Tue.	I217E Functional Programming **(Hirokawa)** I234 Foundation of Software Environment **(Shikida)** I427 System Control Theory **(Asano)**	I212E Analysis for Information Science **(Dang)** I214E System Optimization **(Kaneko･Hiraishi)** I481 Software Development Laboratory for Highly Dependable Embedded Systems **(Suzuki, etc.)**		N002 Study on Nanobiotechnology with Training Course(*) E011 Interaction Seminar 1 E111 Basic TC 1 E211 Intermediate TC 1 E213 Scientific Discussions 1 J011A Introductory Technical Japanese 1 J111A Basic Technical Japanese 1 J211 Intermediate Technical Japanese 1 J411 Advanced Technical Japanese 1	N002 Study on Nanobiotechnology with Training Course(*) E021 Interaction Seminar 2 E113 Basic TC 3 E212 Intermediate TC 2 E411 Advanced TC 1 J011B Introductory Technical Japanese 1 J111B Basic Technical Japanese 1
Wed.	I211 Mathematical Logic **(Ogawa)** I225 Statistical Signal Processing **(Unoki)** I448 Distance Learning System **(Hasegawa)**	I218E Computer Architecture **(Inoguchi)** I233E Operating Systems **(Defago)**		N003 Analysis of Nano Materials with Training Course(*) G212 Writing and Presentation Skills **(Tsuji)** G213E Japan Studies **(Kawanishi)**	N003 Analysis of Nano Materials with Training Course(*) L211E Logic and Mathematics **(Preining)** L212 History and Philosophy of Science **(Mizumoto)** L214E A Methodology for Innovation Design **(Kunifuji, etc.)**
Thu.	I223 Natural Language Processing I **(Shirai)** I235E Game Informatics **(Iida･[Viennot])** I465 Information Security **(Miyaji･Omote･[Su])**	I217E Functional Programming **(Hirokawa)** I234 Foundation of Software Environment **(Shikida)** I427 System Control Theory **(Asano)**		N004 Structural Analysis of Solids on Nano-Scale with Training Course(*) E011 Interaction Seminar 1 E111 Basic TC 1 E211 Intermediate TC 1 E213 Scientific Discussions 1 J011A Introductory Technical Japanese 1 J111A Basic Technical Japanese 1 J211 Intermediate Technical Japanese 1 J411 Advanced Technical Japanese 1	N004 Structural Analysis of Solids on Nano-Scale with Training Course(*) E021 Interaction Seminar 2 E113 Basic TC 3 E212 Intermediate TC 2 E411 Advanced TC 1 J011B Introductory Technical Japanese 1 J111B Basic Technical Japanese 1
Fri.	I212E Analysis for Information Science **(Dang)** I214E System Optimization **(Kaneko･Hiraishi)** I481 Software Development Laboratory for Highly Dependable Embedded Systems **(Suzuki, etc.)**	I211 Mathematical Logic **(Ogawa)** I225 Statistical Signal Processing **(Unoki)** I448 Distance Learning System **(Hasegawa)**			

Irregular class schedule:

I466 Introduction to International Standardization (Somemura, etc.): 5th period of every Friday in Terms 2-1 and 2-2

NOTE:

- Wedensday, October 7 will follow the MONDAY schedule.
- * N00x courses will be offered by the faculty of Center for Nano Materials and Technology and School of Materials Science.

Term 2-2 (December 4 – February 8)

School of Information Science

	1 9:20-10:50	2 11:00-12:30	3	4 15:10-16:40	5 16:50-18:20
Mon.	I236E Logical Inference and Knowledge Representation **(Nguyen)** I435 Software Architecture **(Suzuki)** I440 Enhanced Operating Systems **(K.Tanaka)**	I216 Computational Complexity and Discrete Mathematics **(Omote･[J.Chen])** I219E Software Design Methodology **(Ogata)** I413 Theoretical Computer Science **(Ishihara)**		G211E Global Communication for Collaboration Building **(Kawanishi)**	
Tue.	I226E Computer Networks **(Lim)** I419 Image Information Science **(Yoshitaka)** I613E Algebraic Formal Methods **(Futatsugi･Ogata･Preining･Gaina･Masaki Nakamura)**	I232E Information Theory **(Kurkoski･Matsumoto)** I482 Software Process Design for Highly Dependable Embedded Systems **(Suzuki･Aoki, etc.)**		E011 Interaction Seminar 1 E112 Basic TC 2 E211 Intermediate TC 1 J012A Introductory Technical Japanese 2 J112A Basic Technical Japanese 2 J212 Intermediate Technical Japanese 2 J412 Advanced Technical Japanese 2	E021 Interaction Seminar 2 E113 Basic TC 3 E212 Intermediate TC 2 E412 Advanced TC 2 J012B Introductory Technical Japanese 2 J112B Basic Technical Japanese 2
Wed.	I213E Discrete Signal Processing **(Akagi)** I414 Natural Language Processing II **(Shirai)** E413 Scientific Discussions 2 **(Blake)**	I236E Logical Inference and Knowledge Representation **(Nguyen)** I435 Software Architecture **(Suzuki)** I440 Enhanced Operating Systems **(K.Tanaka)**	**Office Hours (13:30 ~ 15:00)**	G211E Global Communication for Collaboration Building **(Kawanishi)**	
Thu.	I216 Computational Complexity and Discrete Mathematics **(Omote･[J.Chen])** I219E Software Design Methodology **(Ogata)** I413 Theoretical Computer Science **(Ishihara)**	I226E Computer Networks **(Lim)** I419 Image Information Science **(Yoshitaka)** I613E Algebraic Formal Methods **(Futatsugi･Ogata･Preining･Gaina･Masaki Nakamura)**		E011 Interaction Seminar 1 E112 Basic TC 2 E211 Intermediate TC 1 J012A Introductory Technical Japanese 2 J112A Basic Technical Japanese 2 J212 Intermediate Technical Japanese 2 J412 Advanced Technical Japanese 2	E021 Interaction Seminar 2 E113 Basic TC 3 E212 Intermediate TC 2 E412 Advanced TC 2 J012B Introductory Technical Japanese 2 J112B Basic Technical Japanese 2
Fri.	I232E Information Theory **(Kurkoski･Matsumoto)** I482 Software Process Design for Highly Dependable Embedded Systems **(Suzuki･Aoki, etc.)**	I213E Discrete Signal Processing **(Akagi)** I414 Natural Language Processing II **(Shirai)** E413 Scientific Discussions 2 **(Blake)**			

Irregular class schedule:

I466 Introduction to International Standardization (Somemura, etc.): 5th period of every Friday in Terms 2-1 and 2-2

NOTE:

- Friday, December 4 will follow the WEDNESDAY schedule.

4 Curriculum

4.4.1 Overview of curriculum

Based on JAIST's mission statement, the curriculum of the IS school is designed to help students systematically progress from the basics of information science to its cutting-edge frontiers while acquiring fundamental academic skills, that will enable them to make significant contributions to the development of state-of-the-art technologies through learning actively.
Courses are divided into 3 categories:

(1) Courses in the School of Information Science, including Information Science Seminars (lectures and training by external instructors)
(2) Courses in the Institute of General Education common to three schools
(3) Courses at other graduate institutions

Last but not least, it is insufficient for students merely to take lectures with a passive attitude. All the courses in IS school are designed so they require students to work on each course at least 45 hours of independent study per credit. To acquire abilities that will benefit them in the future, students are expected to nurture the seeds of the advanced science and technology in the future.

4.4.2 Courses in the School of Information Science (IS school courses/Ixxx series)

The IS school courses (Ixxx series) are divided into groups using 1) the 5 following areas; A. Theoretical Information Science, B. Human Information Processing, C. Artificial Intelligence, D. Computer Systems and Networks, E. Software Science (see the section 1.1) and 2) the following 4 levels;

I1xx... Introductory courses: are designed mainly for students from outside of the area of information science to acquire foundations necessary for higher level studies.
I2xx... Basic courses: provide standard master-level knowledge on Information Science required for advanced studies.
I4xx... Technical courses and Specialized Technical courses: which provide advanced knowledge on Information Science for master's students. These are provided mostly in Japanese.
I6xx... Advanced courses: which impart advanced knowledge on Information Science for doctoral students. These are provided in English.

In order to acquire a wide range of foundations and specialist knowledge, students must take courses from multiple areas. For more information, refer to the corresponding pages.

5 Guide to program completion

5.1 Course charts in the School of Information Science

In the charts below, “J” in the Language column indicates that the course is offered in Japanese; “E” indicates that the course is offered in English.

5.1.1 Introductory courses

The Introductory courses are mainly offered in Japanese. They are the courses to acquire foundations necessary for higher level studies. In order to take higher level courses, the related introductory course knowledge is required.

Course Number	Course Title	Lan-guage	Course Term	Instructor(s)	Notes
I111	Algorithms and Data Structures	J	1-1	Uehara	
I112	Computer Systems	J	1-1	Yoshitaka	
I114	Fundamental Mathematics for Information Science	J	1-1	Preining	
I115	Digital Logic and Computer Design	J	1-1	Kaneko・Inoguchi	
I116	Programming Laboratory I	J	1-1	Omote・[J.Chen]・[Su]	
I117	Programming Laboratory II	E	1-2	Bonnet	
I118	Graphs and Automata	J	1-1	Tojo	
I119	Statistics in Information Science	J	1-1	Akagi・[Morikawa]	
I120	Fundamentals of Logic and Mathematics	J	1-1	Terauchi	

NOTE: Instructors in brackets [ ] are in charge of the office hours.

5.1.2 Basic courses

All Basic courses are offered twice a year, one in Japanese and the other in English. These courses are designed to impart standard graduate-level knowledge on Information Science, which is required for advanced studies. The knowledge units have been carefully organized so that students can understand basic academic matters to advanced academic issues required for their advanced study. It is advisable for students to select courses without concentrating on a particular area in order to acquire well-balanced knowledge.

More than one instructor may teach one course. Please check the class schedule regarding instructors for each course for each term.

Course Number	Course Title	Lan-guage	Course Term	Instructor(s)	Area	Notes
I211	Mathematical Logic	E	1-1	Ogawa	A	
		J	2-1			
I212	Analysis for Information Science	J	1-1	Kotani	B	
		E	2-1	Dang		
I213	Discrete Signal Processing	J	1-2	Asano	B	
		E	2-2	Akagi		
I214	System Optimization	J	1-1	Kaneko・Hiraishi	A	
		E	2-1			
I216	Computational Complexity and Discrete Mathematics	J	2-2	Omote・[J.Chen]	A	○
		E	1-1	Uehara・Miyaji・[J.Chen]		
I217	Functional Programming	J	1-2	Ogata	E	□
		E	2-1	Hirokawa		
I218	Computer Architecture	J	1-1	K.Tanaka	D	□
		E	2-1	Inoguchi		
I219	Software Design Methodology	J	1-2	Aoki・[Chiba]	E	□
		E	2-2	Ogata		

I223	Natural Language Processing I	E	1-2	Nguyen	C	
		J	2-1	Shirai		
I225	Statistical Signal Processing	E	1-1	H.Tanaka	B	
		J	2-1	Unoki		
I226	Computer Networks	J	1-2	Tan	D	□○
		E	2-2	Lim		
I232	Information Theory	J	1-2	Matsumoto・Kurkoski	A	
		E	2-2	Kurkoski・Matsumoto		
I233	Operating Systems	J	1-1	Shinoda	D	□
		E	2-1	Defago		
I234	Foundation of Software Environment	E	1-2	Suzuki	E	□
		J	2-1	Shikida		
I235	Game Informatics	J	1-1	Ikeda・Iida・[Viennot]	C	*
		E	2-1	Iida・[Viennot]		
I236	Logical Inference and Knowledge Representation	J	1-1	Tojo	C	*
		E	2-2	Nguyen		

NOTE: Instructors in brackets [ ] are in charge of the office hours.

□Program Basic courses for the Highly-Dependable and Smart Embedded Systems Track.

○Program Basic courses for the Information Security Track.

***** If students who enrolled before April 2012 have completed I215, they cannot take I235 nor I236.

5.1.3 Technical courses

The Technical courses consist of highly specialized lectures for master's and doctoral students. The various specializations of our faculty members have been utilized to provide a challenging and rewarding curriculum. These courses are provided biennially (sometimes annually) in Japanese (some lectures are offered in English). As there are some prerequisites, please refer to the syllabus for details.

Course Number	Course Title	Lan-guage	Course Term	Instructor(s)	year of course offered	Area	Notes
I411	Pattern Analysis and Recognition	J		Kotani	biennially	B	
I413	Theoretical Computer Science	J	2-2	Ishihara	biennially★	A	
I414	Natural Language Processing II	J	2-2	Shirai	biennially★	C	
I416	Parallel Processing	J		Inoguchi	biennially	D	
I419	Image Information Science	J	2-2	Yoshitaka	biennially★	B	
I427	System Control Theory	J	2-1	Asano	biennially★	B	
I431	Theory of Algorithms	J		Uehara	biennially	A	
I432	Theory of Discrete-State Systems	J		Hiraishi	biennially	A	
I435	Software Architecture	J	2-2	Suzuki	biennially★	E	□
I437	Coding Theory	J		Matsumoto・Kurkoski	biennially	A	
I438	Exercises on Graph Theory	J	1-2	Kaneko	biennially★	A	
I439	Speech Signal Processing	J	1-2	Akagi・Dang	biennially★	B	
I440	Enhanced Operating Systems	J	2-2	K.Tanaka	biennially★	D	□
I441	Advanced Computer Networks	J	1-2	Shinoda	biennially★	D	□○

I442	Advanced System Software Laboratory	J	1-2	Shikida	annually ★	E	□
I443	Foundation of Software Verification	J		Aoki･[Chiba]	biennially	E	□
I444	Embedded Software Engineering	J	Intensive course	Kishi	annually ★	E	□
I445	Distributed Systems	E	1-2	Defago	annually ★	E	
I446	Computer Systems Performance Analysis	E		Defago･[Viennot]	biennially	D	□
I447	Database Systems	E	1-1	Ogawa･Marukawa	biennially★	E	
I448	Distance Learning System	J	2-1	Hasegawa	biennially★	C	
I450	Network Design Laboratory	J	1-1	Tan･Chinen	annually★	D	
I455	Information Security Application	J		Omote	biennially	A	○
I465	Information Security*	J	2-1	Miyaji･Omote･[Su]	biennially★	A	○*
I467	Processor Design Laboratory	J		Inoguchi･K.Tanaka	biennially	D	□
I468	Modeling of Dynamics	J		Maezono･[Hongo]	biennially	B	

NOTE: Instructors in brackets [ ] are in charge of the office hours.

★The course is offered in the 2015 academic year.

□Program Basic courses for the Highly-Dependable and Smart Embedded Systems Track.

○Program Basic courses for the Information Security Track.

***** If students who enrolled before April 2012 complete I465, I465 is treated as I461S. If they have already completed I461S, they cannot take I465.

5.1.4 Specialized Technical courses

The Specialized Technical courses are designed to impart specialized knowledge in the Fostering Talent Program (Highly-Dependable and Smart Embedded Systems Track, Information Security Track, Fostering ICT Global Leader Track). They are provided annually in Japanese. Since some Specialized Technical courses have exceptional schedules and restrictions, please refer to later sections (6.2.6-5), syllabus, and the class schedule.

Highly-Dependable and Smart Embedded Systems Track

Course Number	Course Title	Lan-guage	Course Term	Instructor(s)	Notes	Area
Progressive courses						
I473	Hardware/Software Codesign	J	Intensive course	Wakabayashi		D
I478	IT Project Management	J	Intensive course	K.Okada		E
Practical courses						
I481	Software Development Laboratory for Highly Dependable Embedded Systems*1	J	2-1	Suzuki, etc.		E
I482	Software Process Design for Highly Dependable Embedded Systems*2	J	2-2	Suzuki･Aoki, etc.		E
I483	Smart Embedded System Development	J	1-2	T.Okada		E

***1** If students who enrolled before April 2013 complete I481, it is treated as I480. If they have already completed I480, they cannot take I481.

***2** If students who enrolled before April 2013 complete I482, it is treated as I479. If they have already completed I479, they cannot take I482.

Information Security Track

Course Number	Course Title	Lan-guage	Course Term	Instructor(s)	Notes	Area *1
Progressive courses						
I465S	Literacy in Information Security Management	J	1-1*6	Miyaji・Futa		D
I466S	Advanced Information Security Theory and Application*2	J	1-2*6	Miyaji・Futa・[S.Tanaka]・[J.Chen]・[Su]		A
I469S	Law and Management of Information Security	J			*	
I470S	Information Security Technology	J			*	
Practical courses						
I471S	Project-based Learning of Information Security Practice*2	J	1-2*6	Miyaji・Futa・Omote・[S.Tanaka]・[J.Chen]・[Su]		A
I478S	Project-based Learning of Network Security	J			*	
I479S	Exercise in Security Project-Based Learning A	J			*1 Credit	
I480S	Exercise in Security Project-Based Learning B	J			*1 Credit	
I481S	Exercise in Security Project-Based Learning C	J			*1 Credit	
I482S	Exercise in Security Project-Based Learning D*3*4	J			*1 Credit	
I483S	Exercise in Security Project-Based Learning E*3	J			*1 Credit	
I484S	Exercise in Security Project-Based Learning F*5	J			*1 Credit	
I485S	Exercise in Security Project-Based Learning G	J			*1 Credit	

NOTE: Instructors in brackets [ ] are in charge of the office hours.
Students in the Information Security Track have priority to register for the above courses. Students who are not in the track may not take the courses.

***** The courses are offered at other graduate schools.

***1** Areas are for the students who are not in the Information Security Track.

***2** I466S and I471S must be taken both in the same term.

***3** Only students who completed I479S and I480S, and either one of I481S or I471S can take these courses.

***4** Students who enrolled before April 2013 and completed I475S cannot take this course.

***5** Only students who completed all of I479S, I480S and I481S and either one of I481S or I471S can take this course.

***6** The courses have irregular class schedules. See the class schedule for detailed schedule.

Fostering ICT Global Leader Track

Course Number	Course Title	Lan-guage	Course Term	Instructor(s)	Notes	Area
I466	Introduction to International Standardization	J	2-1&2-2	Somemura, etc.		

NOTE: The course has an irregular class schedule. See the class schedule for detailed schedule.

5.1.5 Advanced courses

The Advanced courses are highly specialized lectures for students in the master's and doctoral programs. The various specializations of our faculty members have been utilized to provide a

challenging and rewarding curriculum. They are provided biennially in English. As there are some prerequisites (knowledge equivalent to the content of related basic courses) for master's students to take them; please refer to the syllabus for details.

Course Number	Course Title	Lan-guage	Course Term	Instructor(s)	year of course offered	Area
I613	Algebraic Formal Methods	E	2-2	Futatsugi・Ogata・Preining・Gaina・Masaki Nakamura	biennially★	E
I615	Robotics	E		Chong	biennially	B
I620	Foundation of VLSI Design	E		Kaneko	biennially	D
I631	Foundation of Computational Geometry	E		Uehara	biennially	A
I645	Human Perceptual Systems and its Models	E		Unoki	biennially	B
I649	Wireless Sensor Networks	E		Lim	biennially	D
I654	Term Rewriting	E		Hirokawa	biennially	E
I655	Modern Quantum and Neural Computation	E	1-1	H.Tanaka・Maezono	biennially★	B
I656	Logical Decision Procedures	E	1-2	Preining・Hirokawa	biennially★	E

★ The course is offered in the 2015 academic year. There may be changes in the courses offered next year.

5.1.6 Seminars offered by the IS school (Information Science Seminars)

The IS school invites lecturers from other universities, research institutions, and industries and offers practical lectures and exercises as intensive courses, seminars, exercises which can be included in the requirements for completion as the IS courses The school will announce the schedule by email and students can register for courses a month before the start of each course. Students who wish to take these courses are advised to pay attention to email announcements.

I456-457 Information Science Seminars I and II are seminars offered by invited lecturers. Students can attend these seminars without any advance notification or registration. Furthermore, students can earn 1 credit as a part of the requirements by attending the seminars 7 times and submitting a report for each seminar to the corresponding host faculty member.

(1) Students who wish to earn credits from the seminar must submit a report (1600 characters in Japanese or 1200 words in English) for each seminar within 10 days after the seminar. The report should basically include content of the seminar, and survey related to the topic. The report form is available at the JAIST webpage. Students should submit their reports to the corresponding host faculty members and obtain approval seal, and then keep it until they apply for credits.
(2) The deadlines for submitting credit applications are the end of January and the end of July each year.

The school also offers I458 Information Science Seminars III supported by the Semiconductor Technology Academic Research Center (STARC). I458 will be biennially offered for 1 week in late August as Program C of the Embedded Software Engineering Exercise Class.

In program of the Embedded Software Engineering Exercise Class, students form a team with about 5 members, and simulate software development and gain experience as if in industry. A program completion certificate and 1 credit from the Technical courses (without area assignments) will be awarded.

Optional courses

Course Number	Course Title	Course Term	Instructor (s)	Notes
Basic courses				
I241	Information Technology I			1 credit
I242	Information Technology II			1 credit
I243	Information Technology III			1 credit
I244	Information Technology IV			1 credit
Technical courses				
I456	Information Science Seminars I			1 credit
I457	Information Science Seminars II			1 credit
I458	Information Science Seminars III			Biennially, 1 credit
I459	Information Science Seminars IV			1 credit
I461	Advanced Technology I			
I462	Advanced Technology II			
I463	Advanced Technology III			
I464	Advanced Technology IV			
Advanced courses				
I622	Information Processing Theory I			
I623	Information System Theory I			
I624	Information Processing Theory II			
I625	Information System Theory II			
I626	Information Processing Theory III			
I627	Information System Theory III			
I628	Information Processing Theory IV			
I629	Information System Theory IV			
I652	Information Processing Theory V			1 credit
I653	Information System Theory V			1 credit

5.2 Seminar and research

Courses for a major research (seminar) and a minor research (research) are below. For doctoral students, a minor research can be substituted for an internship.

Master's program

Course Number	Course Title	Instructor	Notes
I201	Seminar in Information Science A (Thesis)	Supervisor	8 credits; compulsory elective course
I205	Seminar in Information Science A (Project Report)	Supervisor	2 credits; same as above
I202	Research in Information Science A	Advisor for Minor Research Project	2 credits; compulsory course

Doctoral program

Course Number	Course Title	Instructor	Notes
I601	Advanced Seminar in Information Science B	Supervisor	6 credits; compulsory for doctoral program
I602	Advanced Research in Information Science B1(Minor Research Project)	Advisor for Minor Research Project	4 credits; compulsory elective course
I603	Advanced Research in Information Science B2(Internship)	Advisor for Internship	

5.3 Guidelines for taking courses

See the Institute-wide Study Guide, the section VI.2.

6 Master's program

The master's program in the IS school is mainly aimed at fostering highly advanced engineers. The master's degree in Information Science will be conferred to students when they complete the program.

6.1 Choices in master's program

There are three categories students must pay attention to:

(1) Educational programs: All students must belong to one of the following programs; M, Mα, 5D, and SD programs.
(2) Thesis, Report, Survey: Students must choose to work on writing a thesis (master's thesis), or conducting a research project (Project Report) or conducting a survey (Survey for Doctoral Research Plan) to complete the master's program. In order to choose Survey for Doctoral Research Plan, students must be in the 5D program and choose the Fostering ICT Global Leader Track.
(3) Fostering Talent Program: This program requires Japanese language proficiency as courses in the program are only offered in Japanese. Students who wish to participate in the program must choose one of the following three tracks: i) Highly-Dependable and Smart Embedded Systems Track, ii) Information Security Track, and iii) Fostering ICT Global Leader Track. i) and ii) are for M or Mα students and provide them with highly technical training on specific topics. iii) is specifically for 5D students. They must read this guide carefully before selecting a track since there are differences in employment recommendations, and support after continuing on to the doctoral program (see the section 3.1.3).

6.1.1 Educational programs

The standard period of study for master's and doctoral programs is 2 years and 3 years respectively. The standard period of 2 years (called the M program) can be changed by: The Mα program, which extends the period to the maximum of 3 years (although the tuition is same as that for the 2-year program). The 5D program, which combines the doctoral program with the master's program, and the SD program, which combines the doctoral program with the master's program and shortens the total duration to 4 years.
Note that the SD program can only be selected at the entrance examination. Master's students can select any one of the M, Mα, or 5D programs 5 months after enrollment (i.e., the end of August for students enrolled in April, or February for students enrolled in October) with the guidance of their supervisors. Students are not allowed to change their program they have enrolled in, except for the 5D/SD programs to the M program and the SD program to the 5D program. It is possible for M or Mα program graduates to continue on to the doctoral (3D) program (see the section 3.3).

> **M program:** This program is mainly aimed at fostering highly advanced engineers. The standard length of study for a master's degree (in Information Science) is 2 years. Students can complete a master's program in a shorter time. If a faculty meeting approves their research work is excellent, students may shorten the completion period to a minimum of 1 year, according to JAIST regulations. Advice on this will be offered shortly after enrollment in JAIST.
>
> (1) M program students cannot choose Survey for Doctoral Research Plan.
> (2) M program students can choose either a) Highly-Dependable and Smart Embedded Systems Track or b) Information Security Track but not c) Fostering ICT Global Leader Track.

Mα program: This program is mainly aimed at fostering highly advanced engineers, and has been designed so that students can devote sufficient time to completing their master's degrees. This program is suitable for students who have a background other than information science or who wish to study at a slower pace from the basic of information science. Students can set their period of this program up to 3 years (either 2 years and 3 months, 2 years and 6 months, 2 years and 9 months, or 3 years, with the same tuition as that of in the 2-year program). Students in good standing can also complete the Mα program in a shorter period, 2 years in consultation with their supervisor. Note that once students have decided the length of study, they are not allowed to extend the period of study. Please note that the following restrictions:

(1) Mα students cannot choose Survey for Doctoral Research Plan.
(2) Mα students can choose either i) Highly-Dependable and Smart Embedded Systems Track or ii) Information Security Track but not iii) Fostering ICT Global Leader Track.
(3) The application to shorten the period is acceptable only when students submit a research proposal (at least 1 year prior to completion of the degree) or apply for conferment of a master's degree.
(4) Employment recommendations and issuing an official letter of confirmation of expected completion of a master's degree depend on students' expected date of completion of the degree. If Mα program students are able to complete the program in a shorter time than they originally planned as 3 years and plan to be employed after spending 2 years in the master's program, they must contact Kyoumu.

5D program: This program is a unified program of master's and doctoral programs. The standard period of this program is 5 years to complete both degrees (2 years for the master's and 3 years for the doctoral).

(1) 5D students can choose Survey for Doctoral Research Plan for master's degree only if they are in the Fostering ICT Global Leader Track.
(2) 5D students can choose the Fostering ICT Global Leader Track if they wish, but not the Highly-Dependable and Smart Embedded Systems Track nor the Information Security Track.
(3) In addition to the master's degree requirements, 5D students must satisfy the requirements for continuing on to the doctoral program (see the section 6.2.2 C).
(4) There is financial support for students with excellent academic results after enrolling in the doctoral program.
(5) 5D students will take an internal entrance examination (for the doctoral program at JAIST) at the time of mid-term defense or final defense. If 5D students failed the examination or cannot complete the master's program within 2 years (including the case that students cannot satisfy the requirements described in 6.2.2 C), their program will automatically shift to the M program.
(6) It is possible to change their programs from the 5D to the M program at any time upon the faculty approval. Changing from the M to the 5D program is not allowed.
(7) Employment recommendations and issuing an official letter of confirmation of expected completion of a doctoral degree depend on students' expected date of completion of the degree. If 5D students decide not to go on to the doctoral program to be employed after obtaining a master's degree, they must apply for program change from 5D to M beforehand.
(8) If 5D students who enrolled as a scholarship student change the program to the M program, they will be disqualified for the scholarship.

SD program: Students in this program skip their final undergraduate year and undergo a unified master's and the doctoral program so that they complete both degrees in 4 years (about 1.5 years for the master's and 2.5 years for the doctorate). Students can only select the SD program at the time of entrance examination.

(1) SD program students cannot choose the Fostering Talent program.

(2) If SD program students are unable to complete the master's program in 1.5 years, their program automatically shifts to either the 5D or the M program (which program is up to the student to choose choice).
(3) If SD program students change to another program, they will be disqualified for the scholarship.
(4) Employment recommendations depend on students' expected date of completion of the doctoral degree (i.e., the completion of the SD program).

6.1.2 Master's thesis research, Project Report and Survey for Doctoral Research Plan

Students must choose to work on writing a thesis (master's thesis), or conducting a research project (Project Report) or conducting a survey to prepare for the research in the doctoral program (Survey for Doctoral Research Plan) to receive a master's degree. Students who choose the project report need to take 6 additional credits (3 courses) from the IS school courses. Typical examples of a project report includes a survey, system construction, and database construction. If students choose to work on a survey, they must conduct a research survey to prepare for doctoral research and take a Ph.D. qualifying examination. The choice must be made under guidance by the student's supervisor and must be submitted with the application for the research proposal (details will be described later). Survey for Doctoral Research Plan is only for the students in the Fostering ICT Global Leader Track.

6.1.3 Fostering Talent Program

For the M/Mα students, the Forster Talent Program offers following two tracks, a) Highly-Dependable and Smart Embedded Systems Track and b) Information Security Track which provide them with highly technical training on specific topics. For 5D students, the Fostering ICT Global Leader Track will train students to become leaders in the international society in the future. Japanese language proficiency is required for the program since the courses are only offered in Japanese. Please refer to the Japanese-language version of the Degree Completion Guide for specific program details.

A. Highly-Dependable and Smart Embedded Systems Track: The importance of technology for modifiability and the reliability of support systems in our increasingly computerized society are growing, as our social activities become more reliant on the electronic world, which has been brought about by progress in computer networking. We offer the "Highly-Dependable and Smart Embedded Systems Track" to educate and train highly specialized experts who will serve to improve the development capabilities, productivity, and international competitiveness of related industries. We have organized an environment and facilities for practical exercises and training in embedded-systems verification to cultivate students' problem-solving capabilities in embedded systems.
The PBL (Problem Based Learning) courses are compulsory for the students in this track. The students will acquire cutting-edge knowledge and techniques in order to solve actual system problems in cooperation with companies.
The application deadline for this track is early July (for students who enrolled in April) and early January (for those who enrolled in October). Successful applicants will be selected at a faculty meeting.

B. Information Security Track: This track aims to foster advanced engineers and practitioners of information security in network management. It is conducted in collaboration with distinguished universities, research institutes, companies, and non-profit organizations. In our partner universities (Institute of Information Security, Nara Institute of Science and Technology (NAIST), Keio University, and Tohoku University), pioneers of Internet research in Japan, there are many specialists particularly in the field of information security. This track features interchanging advanced knowledge and sharing of know-how related to network management and education. The focus is not only on how to set up and operate network equipment but also understanding the social background and systematic knowledge of information security.

Students must apply for this track and take paper examinations and interviews at the beginning of April. Successful applicants will be selected at a faculty meeting.

C. Fostering ICT Global Leader Track: This track aims to foster the leaders who can play an active part in international society. The goal of this program is to establish the graduate education which brings up advanced people who can play an active part in an ICT field, in addition to advanced technical knowledge and capability, the degree program which makes a broad view, special application capability, communications skills, internationalism, etc. The purpose is to foster the ICT Global Leader, which raises the talented people who can assert a standard of Japan and play an important role in technical committees, such as ISO, IEC, and ITU, for the international standardization of an ICT field.
The application deadline for this track is mid-April (for students who enrolled in April) and mid-October (for those who enrolled in October). Successful applicants will be selected at a faculty meeting.

6.2 Requirements for completion and continuing on to the doctoral program

6.2.1 Completion requirements

Students must first read the Institute-wide Study Guide, the section VI.1.1. Regarding the section VI.1.1(2), follow the instructions in 3.2.2 below. Check the Institute-wide Study Guide for information regarding taking the IGE courses, courses from other schools in JAIST or ones at other institutes.

6.2.2 Course and credit requirements

A. When students choose a master's thesis as a major research project, they need to obtain:

(1) 8 credits from the I201 Seminar in Information Science A (Thesis)
(2) 2 credits from the I202 Research in Information Science A (Minor Research Project)
(3) 20 credits (10 courses) or more
(4) (3) should include 10 credits (5 courses) or more from the Basic courses in 4 areas and 6 credits (3 courses) or more from any of the IS school courses.

B. When students choose a project report as a major research project, they need to obtain:

(1) 2 credits from the I205 Seminar in Information Science A (Project Report)
(2) 2 credits from the I202 Research in Information Science A (Minor Research Project)
(3) 26 credits (13 courses) or more
(4) (3) should include 10 credits (5 courses) or more from the Basic courses in 4 areas and 12 credits (6 courses) or more from any of the IS school courses with maximum of 6 credits (3 courses) from the Introductory courses.

C. When students continue on to the doctoral program as a 5D program student, they must satisfy the master's completion requirements described above and all the following requirements:

(1) At least 18 credits (9 courses) from the IS school courses. Only 2 credits from the Introductory courses can be included in the 18. When the number of credits from the IS school courses excluding ones from the Introductory courses exceeds 10 (5 courses), the excess of up to 8 credits (4 courses) can be transferred and recognized as credits for the doctoral program completion. For details concerning the application for transfer of credits, see the section 9.2.
(2) 4 credits (2 courses) or more from the IGE courses.
(3) one of the following 3 conditions of English proficiency:
- Those who have enrolled in and successfully completed English courses of a level higher than or equal to the Intermediate level (E211-422).
- Those who have TOEIC score 590 or TOEFL 500 or higher taken within 2 years prior to

their application for admission.

- Those who have submitted a master's thesis or project report in English, presented in English at the oral defense, and passed the final examination.

6.3 Assistance and recommendation for employment

Recommendation for employment can only be given if students:

(1) are expected to complete enough credits for their degree completion requirements.
(2) have been approved by their supervisors.
(3) have had their research proposal on a master's thesis/project report or a survey for the doctoral research plan accepted.
(4) have taken the SPI (Synthetic Personality Inventory) examination twice or more at JAIST.
Students do not have to meet (4) if their Japanese is not fluent enough to take the SPI exam but they obtain an approval from a professor in charge of career assessment upon their supervisor's request.

6.4 Continuing on to the doctoral program

Students must read the Institute-wide Study Guide, the section IX.2.

6.5 Teaching certificate

See the section IX.4 in the Japanese-language version of the Institute-wide Study Guide.

7 Research supervision and schedule for completion of the master's program

The information given below is primarily intended for students who enrolled in April. Students enrolled in October should also follow it, shifting the scheudle by 6 months. We have described the schedule for the M program as standard; for those who are in the Mα program or intending to complete the program in a shorter time, please calculate the deadlines for each milestone.

7.1 Laboratory assignment

See the Institute-wide Study Guide, the section VII.1. Students are to submit their placement preference application in June after laboratory introduction and laboratory visit in May of their 1st year. Then, they will be formally assigned to laboratories. First-year students will be informed of the formal assignment procedure at the student orientation shortly after enrolling at JAIST.

7.2 Major research project (Seminar in Information Science A)

(1) Students must submit a research proposal for a master's thesis or a research project after getting approval from their 3 advisors to Kyoumu by the deadline (roughly 1 year prior to completion of the program); see the table in the section 4.4.1 for details. For example, students enrolled in the M program in April must submit their proposals before the end of March in their 1st year.

(2) Requirements for submitting a research proposal
i) A minor research project (Research in Information Science A) must have been completed.
ii) 10 credits (5 courses) or more from the Basic courses in 4 areas must have been obtained.
iii) 12 credits (6 courses) or more from the IS school courses must have been obtained.
iv) The content of the proposals must be acceptable.
v) Students are required to decide whether they will conduct a master's thesis or a research project in consultation with their supervisor before they submit a research proposal.

(3) Beginning of a research
i) Master's thesis
Students can formally begin their major research project just after their research proposal is accepted and approved by their 3 advisors.

ii) Research Project

Students can formally begin their major research project after they satisfy the following conditions; a) All 3 advisors accepted and approved their research proposal, b) 6 credits or more have been obtained in addition to 12 credits or more of the IS school courses (see 4.2.(2)iii) Note that up to 6 credits (3 courses) from the Introductory courses can be counted in the 18 credits.

(4) Students are supposed to take 1 year or more to complete a master's thesis and 7 months or more to complete a research project. Therefore, if they don't submit their research proposal by the specified deadline, they will not complete the M program in 2 years (see the section 4.4.1).

(5) A mid-term examination of master's thesis and a research project proposal

Students must present their latest progress and results of their master's thesis or research project at the beginning of September in their 2nd year at the mid-term examination.

Students who conduct research project (not a master's thesis) must have obtained 18 credits (9 courses) from the IS school courses by the end of August in their 2nd year before the mid-term examination.

(6) Change from a master's thesis to a research project

After submission of a research proposal for a master's thesis, students who wish to change it to a research project can do so if they have obtained 18 credits (9 courses) from the IS school courses. Please note that it will take 7 months or more to complete a research project after the change. Students who wish to change must contact Kyoumu.

7.3 Minor research project (Research in Information Science A)

(1) A minor research project must be conducted under the supervision of an advisor whose area is outside students' major area. The aim to conduct the project is to enable students to acquire fundamental concepts, knowledge, and abilities in an area outside their major area. Students should conduct a minor research project with one or a combination of the following research methods: theory, interpretation or analysis of data, surveys, or experiments.

(2) Students enrolled in April must start their minor research project by early December in their 1st year after they have been assigned to their advisor for Minor Research Project around July. The duration of the project is assumed to be approximately 2 months, and must be completed by the end of January in their 1st year. Students enrolled in October operate on a scale of 6 months behind those who entered in April.

(3) Students must submit a research theme to Kyoumu within 1 month of starting their research after consultation with their advisor for Minor Research Project. Note that students must obtain at least 4 credits (2 courses) from the IS school courses before they begin their minor research project.

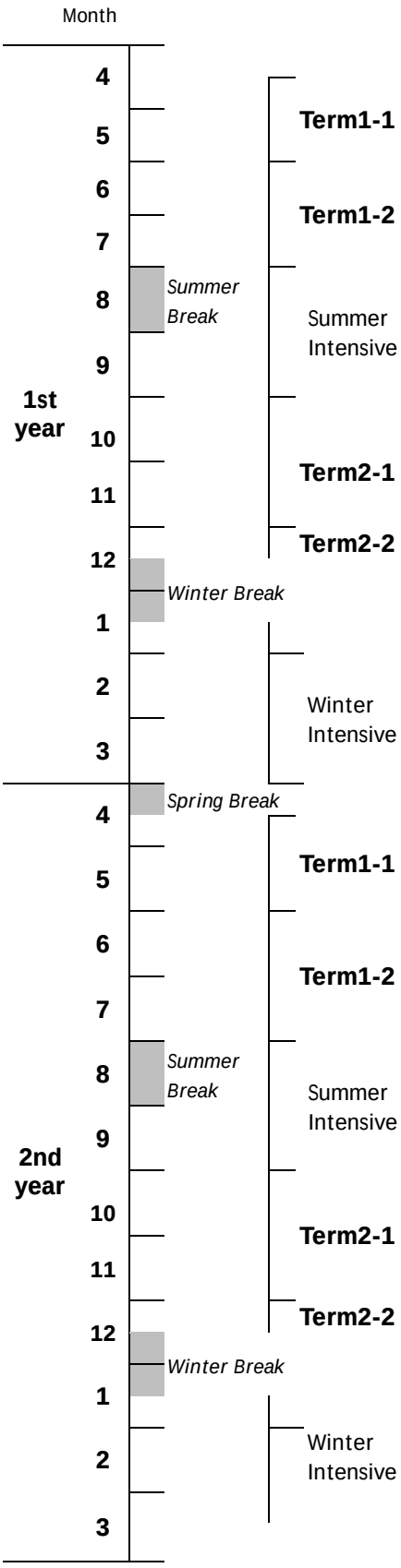
7.4 Conferment of degree

See the Institute-wide Student Guide, the section VIII.1 for details.

7.4.1 Schedule toward degree completion

<table>
<tr><th colspan="2"></th><th>March Completion</th><th>June Completion</th><th>September Completion</th><th>December Completion</th></tr>
<tr><td colspan="2">Minor Research Project</td><td colspan="4">・Before starting a project, students must obtain at least 4 credits (2 courses) from IS school courses.
・After assigned to the advisor (in July), students must begin by early December in their 1st year.
・The project should be done in about 2 months, by the end of January in their 1st year.</td></tr>
<tr><td rowspan="2">A. Research Proposal on Master's Thesis</td><td>Prerequisites for Submission</td><td colspan="4">・Completion of a minor research project.
・At least 12 credits (6 courses). There are different requirements for the students in the Fostering Talent Program. Refer to the degree guide in Japanese for details.
・The content for the proposal is approved by 3 advisors.</td></tr>
<tr><td>Submission Period</td><td>By the end of March of the previous year</td><td>By the end of June of the previous year</td><td>By the end of September of the previous year</td><td>By the end of December of the previous year</td></tr>
<tr><td rowspan="3">B. Research Proposal on Project Report</td><td>Prerequisites for Submission</td><td colspan="4">・Completion of a minor research project.
・At least 12 credits (6 courses). There are different requirements for students in Fostering Talent Program. Refer to the degree guide in Japanese for details.
・The content for the proposal is approved by 3 advisors.</td></tr>
<tr><td>Submission Period</td><td>By the end of March of the previous year</td><td>By the end of June of the previous year</td><td>By the end of September of the previous year</td><td>By the end of December of the previous year</td></tr>
<tr><td>Prerequisite to Start Project</td><td colspan="4">・At least 18 credits (9 courses). There are different requirements for students in Fostering Talent Program. Refer to the degree guide in Japanese for details.</td></tr>
<tr><td colspan="2">Application for Degree and Defense</td><td>End of January</td><td>End of April</td><td>End of June</td><td>End of October</td></tr>
<tr><td colspan="2">Submission of Thesis or Report</td><td>Early February</td><td>Mid-May</td><td>Mid-August</td><td>Mid-November</td></tr>
<tr><td colspan="2">Thesis or Report Defense</td><td>Mid-February</td><td>Late May</td><td>Late August</td><td>Late November</td></tr>
<tr><td colspan="2">Conferment of Degree</td><td>March</td><td>June</td><td>September</td><td>December</td></tr>
</table>

7.5 Standard schedule for M program students enrolled in April



Procedures for assignment to laboratories and for a research project

- Temporary assignment to a laboratory
- Submission of the Study Plan/Record for the 1st year **(Mid-April)**
- Submission of an application for laboratory assignment **(June)**
- Laboratory assignment
- Assignment to an advisor of Minor Research Project **(Project should start between August and early December, and must be completed within 2 months from start, by the end of January.)**
- Submission of a report on a minor research project **(By the end of January)**

Seminars/Research

- Submission of a research proposal on master's thesis or a project report **(By the end of March)**
- Major Research Project **(After February)**
- Submission of Study Plan/Record for 2nd year **(Mid-April)**

Carrying out the Research

- Submission of an application for the doctoral program **(Early July: First submission)**
- Mid-term examination of master's thesis and the project report proposal **(Beginning of September)**
- Submission of an application for the doctoral pogram **(Early June: Second Submission)**
- Submission of an Application For Conferment of Degree **(End of January)**
- Submission of master's theses and the project report **(Mid-February)**
- Conferment of a degree **(March)**

8 Recommended courses for laboratory

Students should check the table below to prepare for their study and plan their research. After being assigned to a laboratory, students are strongly encouraged to consult with their supervisor and discuss about their study plans.

Area	Field	Instructor	Recommended Courses (required knowledge equivalent to)
Theoretical Information Science	Mathematical Logic	ISHIHARA, Hajime	Required Knowledge Equivalent to: I118 and I120 Strongly Recommended Courses: I211 Recommended Courses: I413
	Theory of Algorithms	UEHARA, Ryuuhei	Required Knowledge Equivalent to: I111 and I118 Recommended Course: I431
	Systems Science	HIRAISHI, Kunihiko	Required Knowledge Equivalent to: I118 Recommended Courses: I211, I214, and I432
	Information Security	MIYAJI, Atsuko	Required Knowledge Equivalent to: I111, I116, and I119 Required Courses: I216, I465, I465S, I466S and I471S Recommended Course:I232
		OMOTE, Kazumasa	Required Knowledge Equivalent to: I111, I116, and I119 Recommended Courses: I216, I455 or I465
		SOMEMURA, Yo	Recommended Course: I466
Human Information Processing	Biological Information Processing	DANG, Jianwu	
		TANAKA, Hirokazu	Required Knowledge Equivalent to: I114, I116, and I119 Recommended Courses: I212 and I213
	Acoustic Information Processing	AKAGI, Masato	Required Knowledge Equivalent to: I114 and I119 Strongly Recommended Courses: I212 or I213 Recommended Courses: I225 and I439
		UNOKI, Masashi	Required Knowledge Equivalent to: I114, I116, and I119 Recommended Courses:I212, I213, I225, I439 and I645
	Image Information Processing	KOTANI, Kazunori	Required Knowledge Equivalent to: I114, I116, and I119 Recommended Courses: I212, I213, I225, I411, and I419
		YOSHITAKA, Atsuo	Recommended Courses: I212, I213, I411, I419, and I439
	Robotics	CHONG, Nak-Young	Required Knowledge Equivalent to: I114, I116, and I118 Recommended Courses: I212, I213, and I226
		ASANO, Fumihiko	Required Knowledge Equivalent to: I114 Recommended Courses: I212, I213 and I427
	Computational Engineering and Science	MAEZONO, Ryo	Required Knowledge Equivalent to: I114 Recommended Courses: I212
Artificial Intelligence	Natural Language Processing	SHIRAI, Kiyoaki	Required Knowledge Equivalent to: I118 Recommended Lectures: I223, and I414
	Knowledge Engineering	TOJO, Satoshi	Recommended Courses: I236
		NGUYEN, Minh Le	

	Entertainment Informatics	IIDA, Hiroyuki	Required Knowledge Equivalent to: I119 Recommended Course: I235
		IKEDA, Kokolo	Required Knowledge Equivalent to: I111, I119 and I120 Recommended Courses: I214 and I235
		HASEGAWA, Shinobu	Recommended Courses:I223, I235 or I236, and I448
Computer Systems and Networks	Computer Architecture	INOGUCHI, Yasushi	Required Knowledge Equivalent to: I115 and I116 Recommended Courses: I218 and I111
		TANAKA, Kiyofumi	Required Knowledge Equivalent to: I115 and I116 Required Course: I218 Recommended Courses: I111, I118, and I233
	Integrated Systems	KANEKO, Mineo	Required Knowledge Equivalent to: I115 Recommended Courses: I214, I438, and I620
	Information Networks	TAN, Yasuo	Recommended Courses: I226, I233, I218, I214 and I450
		SHINODA, Yoichi	
		SHIKIDA, Mikifumi	
		LIM, Yuto	Recommended Courses: I232, I214, I212, I213, I226, I233, I217, and I219
		CHINEN, Ken-ichi	Required Knowledge Equivalent to: I115 and I116 Required Course: I218 Recommended Courses: I111, I118, and I233
	Ubiquitous Communications	MATSUMOTO, Tadashi	
		KURKOSKI, Brian Michael	
Software Science	Software Structure	SUZUKI, Masato	Recommended Courses (before laboratory assignment): I234 and I219 Recommended Courses (after laboratory assignment): I442 or I435
	Formal Methods for Software Development	OGATA, Kazuhiro	
		AOKI, Toshiaki	
	Software Verification	OGAWA, Mizuhito	Required Knowledge Equivalent to: I118 Recommended Courses: I211 Recommended Courses (depending on major research project): I216, I217, I443, I447, I613, and I654
		HIROKAWA, Nao	Required Knowledge Equivalent to: I111 and I118 Strongly Recommended Courses: I217 Recommended Courses: I211, I216, I413, and I654
	Dependable Systems	TERAUCHI,Tachio	
		DEFAGO, Xavier	Required Knowledge Equivalent to: Introductory Courses Basic Courses (three or four courses from I233, I219, I226, and I211) Strongly Recommended Technical Courses: in order of I445, I435, and I442 Recommended Courses (depending on major research project): in order of I446, I440, I441, I431, I432, I218, and I217

9 Doctoral program

The doctoral program is aimed at fostering highly advanced engineers and researchers in advanced information science. A Ph.D. in Information Science is conferred on completion.
Doctoral students are encouraged to engage in off-campus research activities at other universities, research institutes or corporations either in or outside Japan, and an internship at companies either in or outside Japan. These activities are strongly recommended for students in the 3D/5D programs and necessary for those in the SD program.

9.1 Choices in doctoral programs

There are two categories students must pay attention to:

(1) Educational programs: There are the 5D and the SD programs, which offer consecutive five or four-year doctoral education through the master's program and the doctoral program and the 3D program, which is a standard three-year doctoral program. Scholarship is available for students who have high academic achievement. For more information regarding scholarship, refer to the JAIST webpage.

(2) Career track choice: Students must choose one of two tracks; type E (for students who plan on becoming an engineer in business enterprise) or type S (for students who plan on becoming a researcher in advanced information science) about 3 months after enrollment. Although there is no official difference between Type E and Type S in terms of JAIST degree requirements and supports, students are expected to take this opportunity to consult their supervisors about their future career plan.

9.2 Completion requirements for doctoral degree

9.2.1 Completion requirements

See the Institute-wide Study Guide, the section VI.1.2.

9.2.2 Course requirements and credit transfer

Regarding the section VI.1.2 (2) in the Institute-wide Study Guide, follow the instructions below. Check the Institute-wide Study Guide for information regarding taking the IGE courses, courses from other schools in JAIST or ones at other institutes.
Students are required to obtain at least 20 credits from the IS school courses. The followings are the details:

(1) 6 credits from I601 Advanced Seminar in Information Science B, and
4 credits from either I602 Advanced Research in Information Science B1 or I603 Advanced Research in Information Science B2
(2) 10 credits (5 courses) or more from the IS school courses in 3 areas excluding the Introductory courses. The credits earned in the master's program cannot be recognized to fullfill requirements in the doctoral program except for (3) below.
(3) Credit transfer
Check the Institute-wide Study Guide, the section VI.6. Credits up to a maximum of 8 of the credits exceeding 10 credits earned from 5 Basic courses in 4 areas of the IS school courses except for the Introductory courses in the master's program can be recognized as credits earned in the doctoral program upon the faculty approval. Students who wish to apply for credit transfer must apply to the dean within 2 weeks after enrollment in the doctoral program at JAIST. The credits obtained at other universities, if the content of courses meets more than 80% in terms of knowledge units, can be treated similarly.

10 Research supervision and schedule for completion of the doctoral program

The information given below is primarily intended for students enrolled in April. It can also be applied correspondingly to students enrolled in October, shifting the schedule by 6 months. We have described the schedule to complete the doctoral program as in 3 years; for those who are in the 5D or SD programs or who intending to complete the program in a shorter time, please calculate the deadlines for each milestone.

10.1 Laboratory assignment

See the Institute-wide Study Guide, the section VII.1.1.2.

10.2 Major research project (Advanced Seminar in Information Science B)

(1) Submission of a research proposal
A research proposal for a doctoral dissertation must be submitted to Kyoumu within 1 year after enrollment in the doctoral program. It must be approved by their 3 advisors (a supervisor, second supervisor, and an advisor for Minor Research Project/Internship) before submission.

(2) Students can formally begin their major research project after the 3 advisors' acceptance of the research proposal.

10.3 Minor research project (Advanced Research in Information Science B1)

(1) A minor research project must be a research selected from a neighboring or related to their major research field. Students must conduct a minor research project that will be useful to their major research project. They must receive guidance from a faculty member outside the field they belong to (including other areas).

(2) An advisor for Minor Research Project must be decided when students submit their research proposal for a major research project.

(3) A minor research project (approximately 6 months in duration) must be completed before submitting a doctoral dissertation.

(4) Each student must submit a research title and the name of their advisor for Minor Research Project to Kyoumu before conducting a minor research project.

10.4 Internship (Advanced Research in Information Science B2)

(1) Internships are conducted at companies etc. for a period longer than 3 months.

(2) Students who wish to apply for an internship must find a faculty member who will assume the role of an advisor for Internship in consultation with their supervisor.

(3) The internship and the submission of a report must be completed before submitting a doctoral dissertation outline. Students must attach an evaluation from the company with the report and submit them to their advisor for Internship.

(4) Students who wish to apply for an internship must follow prescribed procedures at the Career Support Section when they start their internship.

10.5 Grant for off-campus research and internship

Students are encouraged to carry out research at other universities, research institutions and companies in Japan or abroad, or to do an internship at companies. These activities are necessary to complete the SD program. For detailed information regarding financial support for these, see *HANDBOOK for Students*. When an off-campus activity is approved as a minor research project, students may earn credits for I602 Advanced Research in Information Science B1. When an off-campus activity is approved as an internship, students earn credits for I603 Advanced Research in Information Science B2. Other activities are regarded as a part of Advanced Seminar in Information Science B. An application form must be submitted at least two months before the start of these activities. See the section VII.4 in the Institute-wide Study Guide for the necessary procedures.

10.6 Conferment of degree

See the Institute-wide Study Guide, the section VIII.2.

10.6.1 Schedule by completion time

	March Completion	June Completion	September Completion	December Completion
Research proposal	Must be submitted within 1 year after enrolling in the doctoral program (within 6 months for SD program students)			
Minor research project or internship	Must be completed before submission of a dissertation outline			
Dissertation outline*	By early July of the previous year	By early October of the previous year	By early January	By early April
Application for preliminary defense	Early October of the previous year	Early January	Early April	Early July
Preliminary defense	December of the previous year	March	June	September
Application for degree	Early January	Early April	Early July	Early October
Formal hearing, oral defense, and fnal examination	Early February	Early May	Early August	Early November
Conferment of degree	March	June	September	December

* Students can shorten the program period for completion by submitting an outline earlier than the planned.

10.6.2 Schedule toward degree conferment

The following table is a standard timeline for the doctoral students who enrolled in April intending to complete in 3 years.

Category	Submit to	Period
Research proposal	Kyoumu	By the end of March in the 1st year
Minor research project or internship	Their advisor's name and a title of the project must be submitted to Kyoumu. Their advisor's name for Internship to Kyoumu.	By the end of March in their 1st year (must be done before the dissertation outline submission)
Dissertation outline	Kyoumu	By early July in their 3rd year
Application for preliminary defense	Kyoumu (dissertation and main publication titles)	Early October
Dissertation Draft	Should be distributed to 5 or more members of the Doctoral Dissertation Preliminary Examination Committee	At least 2 weeks before the preliminary defense
Preliminary defense		December
Application for conferment of degree, doctoral dissertation and abstract	Kyoumu After a successful preliminary defense	Early January
Selection of members for doctoral dissertation examination committee		January
Formal hearing, oral defense, and final examination		Early February

Decision results on conferment of degree		February
Dissertation abstract	Kyoumu (formatted as instructed by JAIST) After a successful oral defense	By the degree conferment day
Conferment of degree		Late March

11 Courses at other graduate institutions

See the Institute-wide Study Guide, the section VI.7.

School of Materials Science

School of Materials Science

1 Outline of the school

Progress in science and technology requires us to build upon conventional science and technology through new and original research. With this in mind, the school has integrated physics, chemistry, biology, and computer science into the curriculum, and offers comprehensive research and education ranging from basic to applied science. We conduct advanced research to produce new science and technologies that will play leading roles in the coming era by utilizing nanotechnology, which enables us to observe and control materials at the atomic and molecular scales.

The school focuses on three areas.

◇ Materials Characterization and Devices (Physics-oriented)

This area focuses on the characterization of atomic and molecular structures and the electronic state of materials, the analysis of properties created by such structures and states, and the training of individuals capable of contributing to the development of new materials and devices.

◇ New Materials Design and Synthesis (Chemistry-oriented)

This area focuses on the systematic characterization of chemical compositions and material structures, clarification of the functionality of materials for the rational design of new functions, and the training of individuals capable of contributing to the creation of new functional materials on the basis of design at the atomic and molecular levels.

◇ Biofunction and Organization (Biology-oriented)

This area focuses on the characterization of the dynamic structure of biomolecules, the systematic understanding of the principles of biological functionality, and the training of individuals capable of contributing to the construction and control of novel functional biomaterials for innovative technological applications through the modulation of function.

Dean: Professor Toshifumi Tsukahara

Number of students

	Master's program	Doctoral program
Department of Materials Science	120	35

2 Faculty profiles

◇ School of Materials Science

Name	Position	Specialization
Materials Characterization and Device		
SHIMODA, Tatsuya	Professor	Micro-liquid Process, Soft Material Device
TOMITORI, Masahiko	Professor	Surface Science
MIZUTANI, Goro	Professor	Surface Science, Nonlinear Optics
MURATA, Hideyuki	Professor	Organic Optoelectronic Devices
MIZUTA, Hiroshi	Professor	Nanoelectronics, NEMS, Atom-scale devices
OZAKI, Taisuke	Visiting Professor	Computational Solid State Physics, Computational Chemistry
KOYANO, Mikio	Associate Professor	Solid State Theory
HORITA, Susumu	Associate Professor	Electron Device, Crystal Growth of Thin Film
TAKAMURA, Yukiko	Associate Professor	Surface/Interface Engineering, Film Growth
OSHIMA, Yoshifumi	Associate Professor	Surface/Interface Physics, Electron Microscopy
AN, Toshu	Associate Professor	Nanosurface Science, Spin Science
HIRJIBEHEDIN, Cyrus Farokh	Visiting Associate Professor	Condensed Matter Physics, Surface Science
SAKAI, Heisuke	Assistant Professor	Organic memory devices, Organic sensor devices
SASAHARA, Akira	Assistant Professor	Surface Science
FLEURENCE, Antoine	Assistant Professor	Inorganic Thin Film Growth, Surface Science
MASUDA, Takashi	Assistant Professor	Solution processes, Interface Science
MURUGANATHAN, Manoharan	Assistant Professor	Nanodevices, NEMS, RF devices
KHUAT, Hien Thi Thu	Assistant Professor	Sum frequency generation, second harmonic generation spectroscopy and microscopy. Surface sciences.
New Materials Design and Synthesis		
EBITANI, Kohki	Professor	Chemistry of Heterogeneous Catalysts, Design of Functionalized Catalyst Surface, Nano Materials Technology
TERANO, Minoru	Professor	Polymers (Organic Materials), Catalytic Chemistry
YAMAGUCHI, Masayuki	Professor	Polymer Physics, Rheology
MATSUMI, Noriyoshi	Professor	Polymer Synthesis, Functional Polymers
MAENOSONO, Shinya	Professor	Functional Materials Chemistry, Colloid Chemistry, Chemical Engineering
MIYAKE, Mikio	Visiting Professor	Preparation and Characterization of Functional Cluster Materials
SANKAR, Gopinathan	Visiting Professor	Materials Chemistry, Catalyst Chemistry
NGUYEN, Thanh Thi Kim	Visiting Professor	Nanomaterials Chemistry, Nanomagnetic Medicine
KANEKO, Tatsuo	Associate Professor	Polymer Chemistry, Liquid Crystal Science, Eco-materials
SHINOHARA, Ken-ichi	Associate Professor	Polymer Chemistry, Functional Polymer Synthesis, Single-Molecules Imaging
MATSUMURA, Kazuaki	Associate Professor	Polymer science, biomaterial, tissue engineering
NAGAO, Yuki	Associate Professor	Protonics, Solid State Chemistry, Polymer Chemistry, Coordination Chemistry
TANIIKE, Toshiaki	Associate Professor	Computational Science, Catalystic Science, Surface Science
TATEYAMA, Seiji	Research Lecturer	Organosilicon Chemistry, Organic Chemistry
NISHIMURA, Shun	Assistant Professor	Catalyst chemistry
NOBUKAWA, Shogo	Assistant Professor	Polymer property, Dielectric property, Rheology
VEDARAJAN, Raman	Assistant Professor	Electrochemistry, Energy Devices, Electrochemical Sensors
MOTT, Derrick Michael	Assistant Professor	Nanotechnology and materials synthesis and characterization
OKEYOSHI, Kosuke	Assistant Professor	Polymer chemstry, Photochemistry, Soft matter
CHAMMINGKWAN, Patchanee	Assistant Professor	Catalytic Chemistry, Polyolefin

Biofunction and Organization		
TAKAGI, Masahiro	Professor	Biotechnology, Synthetic Biology
FUJIMOTO, Kenzo	Professor	Bioorganic Chemistry
HOHSAKA, Takahiro	Professor	Advanced Genetic Engineering, Biomacromolecular Science
TAKAMURA, Yuzuru	Professor	Microfabrication Process, Integrated Bioscience System
TSUKAHARA, Toshifumi	Professor	Molecular Biology, RNA Analysis, RNA Engineering
TSUTSUI, Hidekazu	Associate Professor	Soft matter physics･Biophysics･Physical chemistry
HIRATSUKA, Yuichi	Associate Professor	Molecular robotics, Nanobiotechnology, Biophysics, MEMS
HAMADA, Tsutomu	Associate Professor	Soft Matter Physics, Biological Physics, Artificial Cell
SHIMOKAWA, Naofumi	Assistant Professor	Soft matter physics, Biophysics, Physical chemistry
SAKAMOTO, Takashi	Assistant Professor	Biochemistry, Nucleic Acid Chemistry, Genome Chemistry
ODA, Kazushi	Assistant Professor	Molecular Biology, Biophysics
MIZUKAMI, Taku	Assistant Professor	Biophysics, Photobiology, Scientific Computation, Data Mining
WATANABE, Takayoshi	Assistant Professor	Chemical Biology, Protein Engineering
NAGAI, Ken	Assistant Professor	Nonlinear physics, Nonequilibrium physics
PHAN, Tue Trong	Assistant Professor	Electronic materials and devices, solution process, printed electronics
SUZUKI, Hitoshi	Research Assistant Professor	Molecular Biology, Biochemistry

◇ Chairs operated jointly with research institutes and/or companies

Name	Position	Specialization
Thermo-electric Conversion (ICU)		
OKANO, Ken	Visiting Professor	Semiconductor Physics, Photoelectric Devices
Stress Signal Research (National Institute of Advanced Industrial Science and Technology)		
YOSHIDA, Yasukazu	Visiting Professor	Bio-organic Chemistry
NAGAI, Hidenori	Visiting Associate Professor	Nano-micro Science
Computing in Materials Science (Institute of Science and Engineering, Kanazawa University)		
NAGAO, Hidemi	Visiting Professor	Computqational Bioscience
SAITO, Mineo	Visiting Professor	Computational Materials Physics
Nanotechnology Chair Cooperated with Vietnam (Vietnam National University, Hanoi)		
PHAM, Viet Hung	Visiting Professor	Environmental Analytical Chemistry, Instrumental Analysis Devices, Sensors Development and Application
NGUYEN, Tuan Anh	Visiting Associate Professor	Computational design of molecular magnet
Nanoimaging Physics (Institute of Science and Engineering, Kanazawa University)		
ARAI, Toyoko	Visiting Professor	Surface Science, Nanophysics
Materials and Devices for Renewable Energy (Research Center for Photovoltaics, National Institute of Advanced Industrial Science and Technology)		
KONDO, Michio	Visiting Professor	Semiconductor Engineering, Plasma Process Engineering, Photovoltaics
MASUDA, Atsushi	Visiting Professor	Photovoltaics, Thin-film Electronic Materials
Nano-Devices (University of Southampton)		
CHONG, Harold Meng Hoon	Visiting Associate Professor	Nanoelectronics, Nanophotonics
Aroma Science (Takasago International Corporation)		
TSUJINO, Yoshio	Visiting Professor	Cosmetic Science
HOSHINO, Kunihide	Visiting Associate Professor	Aromascience

Nano-analysis research by synchrotron (Japan Synchrotron Radiation Research Institute)		
A course for solution-based Si nano-device study (Delft University of Technology)		
ISHIHARA, Ryoichi	Visiting Professor	Thin Film Transistors, Semiconductor Properties, Electronic Devices
Ultra-fine patterning by a focused ion beam (Hitachi High-Tech Science Corporation)		
YASAKA, Anto	Visiting Professor	Charged Particle Beam Technology, Nano Fabrication
Applied Process Chemical Science for Green Synthesis (Department of Chemistry, the University of Delhi)		
RAWAT, Diwan S	Visiting Professor	Chemical Organic Synthesis

◇ Center for Nano Materials and Technology

Name	Position	Specialization
OHKI, Shin-ya*3	Professor	Protein NMR, Structural Biology, Biophysics
IWASAKI, Hideo*1	Professor	Low Temperature Physics
SUZUKI, Toshikazu*1	Professor	Semiconductor Device, Crystal Growth
YAMADA, Syoji*1	Visiting Professor	Quantum Electron Property of Compound Semiconductors and Composite Hyperfine Structure
AKABORI, Masashi*1	Associate Professor	Semiconductor Nanostructures, Semiconductor Spintronics
OSAKA, Issey*3	Lecturer	Mass spectrometry, Proteomics, Chromatography
SHIMAHARA, Hideto*3	Assistant Professor	Biocatalytic Science, NMR Structural Biology, Biomolecular Quantum Chemsitry
UMETSU, Yoshitaka*3	Assistant Professor	Structural Biology, Biophysics, Protein Science

◇ Green Devices Research Center

Name	Position	Specialization
TOKUMITSU, Eisuke*1	Professor	Solid State Electronics, Semiconductor Devices, Electronic Materials, Green Devices
INOUE, Satoshi*1	Research Professor	Device Physics, Electronic Devices, Semiconductor Devices, Display Devices
OHDAIRA, Keisuke*1	Associate Professor	Solar Cells, Semiconductor Engineering, Thin Film Formation
BIYANI, Manish*3	Research Associate Professor	Biomaterials design, Hybrid Bio-nano devices, Peptasensors
HAGA, Kenichi*1	Assistant Professor	Electronic Devices, Oxide Materials

*1 The member belongs to the area of the Materials Characterization and Device.
*2 The member belongs to the area of the New Materials Design and Synthesis.
*3 The member belongs to the area of the Biofunction and Organization.

3 Class schedule for 2015-2016

Term 1-1 (April 8 – June 5)

School of Materials Science

	1 9:20-10:50	2 11:00-12:30	3	4 15:10-16:40	5 16:50-18:20
Mon.	M221 Organic Chemistry **(Matsumi)** M245 Mathematics for Condensed Matter Science and Technology **(Koyano)** M615E Advanced Biofunctions **(Takagi･Yuzuru Takamura)**	M113 Introduction to Bioscience **(Takagi･Shimokawa)** M231 Bioorganic Chemistry **(Fujimoto･Hohsaka)**		G212 Writing and Presentation Skills **(Tsuji)** G213E Japan Studies **(Kawanishi)**	L211 Logic and Mathematics **(Preining)** L212E History and Philosophy of Science **(Mizumoto)** L214 A Methodology for Innovation Design **(Kunifuji, etc.)**
Tue.	M111A Introduction to Physics A **(Horita)** M111B Introduction to Physics B **(Mizutani)**	M211 Quantum Mechanics **(Murata)** M223 Properties of Organic Materials **(Nagao)** M611E Electronic Structures of Solids and Surfaces **(Tomitori･Mizutani･Yukiko Takamura･Fleurence)**		E011 Interaction Seminar 1 E111 Basic TC 1 E211 Intermediate TC 1 E213 Scientific Discussions 1 J011A Introductory Technical Japanese 1 J111A Basic Technical Japanese 1 J211 Intermediate Technical Japanese 1 J411 Advanced Technical Japanese 1	E021 Interaction Seminar 2 E113 Basic TC 3 E212 Intermediate TC 2 E411 Advanced TC 1 J011B Introductory Technical Japanese 1 J111B Basic Technical Japanese 1
Wed.	M112 Introduction to Chemistry **(Taniike･Matsumura)** M251 Chemistry of Catalyst and Catalysis **(Ebitani)**	M221 Organic Chemistry **(Matsumi)** M245 Mathematics for Condensed Matter Science and Technology **(Koyano)** M615E Advanced Biofunctions **(Takagi･Yuzuru Takamura)**	**Office Hours (13:30 ~ 15:00)**	G212 Writing and Presentation Skills **(Tsuji)** G213E Japan Studies **(Kawanishi)**	L211 Logic and Mathematics **(Preining)** L212E History and Philosophy of Science **(Mizumoto)** L214 A Methodology for Innovation Design **(Kunifuji, etc.)**
Thu.	M113 Introduction to Bioscience **(Takagi･Shimokawa)** M231 Bioorganic Chemistry **(Fujimoto･Hohsaka)**	M111A Introduction to Physics A **(Horita)** M111B Introduction to Physics B **(Mizutani)**		E011 Interaction Seminar 1 E111 Basic TC 1 E211 Intermediate TC 1 E213 Scientific Discussions 1 J011A Introductory Technical Japanese 1 J111A Basic Technical Japanese 1 J211 Intermediate Technical Japanese 1 J411 Advanced Technical Japanese 1	E021 Interaction Seminar 2 E113 Basic TC 3 E212 Intermediate TC 2 E411 Advanced TC 1 J011B Introductory Technical Japanese 1 J111B Basic Technical Japanese 1
Fri.	M211 Quantum Mechanics **(Murata)** M223 Properties of Organic Materials **(Nagao)** M611E Electronic Structures of Solids and Surfaces **(Tomitori･Mizutani･Yukiko Takamura･Fleurence)**	M112 Introduction to Chemistry **(Taniike･Matsumura)** M251 Chemistry of Catalyst and Catalysis **(Ebitani)**			

NOTE:

- The first class of B101 will be held on Wednesday, April 8. The second and subsequent classes of B101 will be held in Term 1-2.
- All lectures except B101 in this term will start on Thursday, April 9 and the day will follow the WEDNESDAY schedule.
- Friday, June 5 will follow the MONDAY schedule.

Term 1-2 (June 10 – August 3)

School of Materials Science

	1 9:20-10:50	2 11:00-12:30	3	4 15:10-16:40	5 16:50-18:20
Mon.	M222 Computational Material Design **(Shimoda･Dam)** M254 Synthetic Design of Polymers **(Kaneko)**	M232 Biofunctional Materials **(Hamada)** M618E Materials Design **(Ebitani･Matsumura･Maenosno)**	**Office Hours (13:30 ~ 15:00)**	N008 Nano Quantum Device Materials (*) B101 Career Development Basic **(Kohda, etc.)** G211E Global Communication for Collaboration Building **(Kawanishi)**	N008 Nano Quantum Device Materials (*) B101 Career Development Basic **(Kohda, etc.)**
Tue.	M213 Electromagnetic Theory **(Tomitori)** M261 Functional Biomolecules **(Tsutsui)** M421 Electronics **(T.Suzuki)**	M243 Solid State Physics I **(Yukiko Takamura)** M423 Functional Protein Device **(Hiratsuka)**		N006 Nano IT Materials (*) E011 Interaction Seminar 1 E112 Basic TC 2 E211 Intermediate TC 1 J012A Introductory Technical Japanese 2 J112A Basic Technical Japanese 2 J212 Intermediate Technical Japanese 2 J412 Advanced Technical Japanese 2	N006 Nano IT Materials (*) E021 Interaction Seminar 2 E113 Basic TC 3 E212 Intermediate TC 2 E412 Advanced TC 2 J012B Introductory Technical Japanese 2 J112B Basic Technical Japanese 2
Wed.	M415 Medical Biomaterials **(Tsukahara･H. Suzuki)** M224 Inorganic Materials Chemistry **(Maenosono)** E413 Scientific Discussions 2 **(Blake)**	M222 Computational Material Design **(Shimoda･Dam)** M254 Synthetic Design of Polymers **(Kaneko)**		N007 Nano Biodevice Materials (*) G211E Global Communication for Collaboration Building **(Kawanishi)**	N007 Nano Biodevice Materials (*)
Thu.	M232 Biofunctional Materials **(Hamada)** M618E Materials Design **(Ebitani･Matsumura･Maenosno)**	M213 Electromagnetic Theory **(Tomitori)** M261 Functional Biomolecules **(Tsutsui)** M421 Electronics **(T.Suzuki)**		E011 Interaction Seminar 1 E112 Basic TC 2 E211 Intermediate TC 1 J012A Introductory Technical Japanese 2 J112A Basic Technical Japanese 2 J212 Intermediate Technical Japanese 2 J412 Advanced Technical Japanese 2	E021 Interaction Seminar 2 E113 Basic TC 3 E212 Intermediate TC 2 E412 Advanced TC 2 J012B Introductory Technical Japanese 2 J112B Basic Technical Japanese 2
Fri.	M243 Solid State Physics I **(Yukiko Takamura)** M423 Functional Protein Device **(Hiratsuka)**	M415 Medical Biomaterials **(Tsukahara･H. Suzuki)** M224 Inorganic Materials Chemistry **(Maenosono)** E413 Scientific Discussions 2 **(Blake)**			

NOTE:

- * N00x courses will be offered by the faculty of Center for Nano Materials and Technology and School of Materials Science.

Term 2-1 (October 7 – December 2) School of Materials Science

	1 9:20-10:50	2 11:00-12:30	3	4 15:10-16:40	5 16:50-18:20
Mon.	M413E Extreme Materials **(Maenosono・Nagao・Taniike・Mott)** M211 Quantum Mechanics **(Iwasaki)**	M262 Biomaterial Sensing **(Yuzuru Takamura)** M420 Solid State Physics II **(Akabori)**		N001 Fabrication of Nano-Devices with Training Course(*) G212 Writing and Presentation Skills **(Tsuji)** G213E Japan Studies **(Kawanishi)**	N001 Fabrication of Nano-Devices with Training Course(*) L211E Logic and Mathematics **(Preining)** L212 History and Philosophy of Science **(Mizumoto)** L214E A Methodology for Innovation Design **(Kunifuji, etc.)**
Tue.	M225 Structure Analysis of Materials **(Shinohara)** M245 Mathematics for Condensed Matter Science and Technology **(Mizuta)** M282E New Materials Design and Synthesis **(Yamaguchi・Matsumi・Maenosono)**	M212 Statistical Mechanics **(Shimoda)** M231 Bioorganic Chemistry **(Fujimoto・Hohsaka)**		N002 Study on Nanobiotechnology with Training Course(*) E011 Interaction Seminar 1 E111 Basic TC 1 E211 Intermediate TC 1 E213 Scientific Discussions 1 J011A Introductory Technical Japanese 1 J111A Basic Technical Japanese 1 J211 Intermediate Technical Japanese 1 J411 Advanced Technical Japanese 1	N002 Study on Nanobiotechnology with Training Course(*) E021 Interaction Seminar 2 E113 Basic TC 3 E212 Intermediate TC 2 E411 Advanced TC 1 J011B Introductory Technical Japanese 1 J111B Basic Technical Japanese 1
Wed.	M252 Polymer Design **(Yamaguchi・Matsumura)** M414 Device Physics **(Tokumitsu)**	M413E Extreme Materials **(Maenosono・Nagao・Taniike・Mott)** M211 Quantum Mechanics **(Iwasaki)**	Office Hours (13:30 ~ 15:00)	N003 Analysis of Nano Materials with Training Course(*) G212 Writing and Presentation Skills **(Tsuji)** G213E Japan Studies **(Kawanishi)**	N003 Analysis of Nano Materials with Training Course(*) L211E Logic and Mathematics **(Preining)** L212 History and Philosophy of Science **(Mizumoto)** L214E A Methodology for Innovation Design **(Kunifuji, etc.)**
Thu.	M262 Biomaterial Sensing **(Yuzuru Takamura)** M420 Solid State Physics II **(Akabori)**	M225 Structure Analysis of Materials **(Shinohara)** M245 Mathematics for Condensed Matter Science and Technology **(Mizuta)** M282E New Materials Design and Synthesis **(Yamaguchi・Matsumi・Maenosono)**		N004 Structural Analysis of Solids on Nano-Scale with Training Course(*) E011 Interaction Seminar 1 E111 Basic TC 1 E211 Intermediate TC 1 E213 Scientific Discussions 1 J011A Introductory Technical Japanese 1 J111A Basic Technical Japanese 1 J211 Intermediate Technical Japanese 1 J411 Advanced Technical Japanese 1	N004 Structural Analysis of Solids on Nano-Scale with Training Course(*) E021 Interaction Seminar 2 E113 Basic TC 3 E212 Intermediate TC 2 E411 Advanced TC 1 J011B Introductory Technical Japanese 1 J111B Basic Technical Japanese 1
Fri.	M212 Statistical Mechanics **(Shimoda)** M231 Bioorganic Chemistry **(Fujimoto・Hohsaka)**	M252 Polymer Design **(Yamaguchi・Matsumura)** M414 Device Physics **(Tokumitsu)**			

Irregular class schedule:

M616E Advanced Biomaterials (Hiratsuka・Tsutsui・Hamada・Nagai): Dates to be announced

M620E Electronic Properties of Condensed Matter (Murata・Sakai・Koyano・An): Dates to be announced

NOTE:

- Wedensday, October 7 will follow the MONDAY schedule.
- * N00x courses will be offered by the faculty of Center for Nano Materials and Technology and School of Materials Science.

Term 2-2 (December 4 – February 8)

School of Materials Science

	1 9:20-10:50	2 11:00-12:30	3	4 15:10-16:40	5 16:50-18:20
Mon.	M411 Methods of Instrumental Analysis **(Oshima)**	M614E Advanced Device Physics **(Ohdaira)**	Office Hours (13:30 ~ 15:00)	G211E Global Communication for Collaboration Building **(Kawanishi)**	
Tue.		M281E Quantum Theory and its application to Solid State Electronics **(Mizuta･Murata･T.Suzuki)**		E011 Interaction Seminar 1 E112 Basic TC 2 E211 Intermediate TC 1 J012A Introductory Technical Japanese 2 J112A Basic Technical Japanese 2 J212 Intermediate Technical Japanese 2 J412 Advanced Technical Japanese 2	E021 Interaction Seminar 2 E113 Basic TC 3 E212 Intermediate TC 2 E412 Advanced TC 2 J012B Introductory Technical Japanese 2 J112B Basic Technical Japanese 2
Wed.	M283E Biofunction and Organization **(Takagi･Tsukahara･Yuzuru Takamura･Ohki)** E413 Scientific Discussions 2 **(Blake)**	M411 Methods of Instrumental Analysis **(Oshima)**		G211E Global Communication for Collaboration Building **(Kawanishi)**	
Thu.	M614E Advanced Device Physics **(Ohdaira)**			E011 Interaction Seminar 1 E112 Basic TC 2 E211 Intermediate TC 1 J012A Introductory Technical Japanese 2 J112A Basic Technical Japanese 2 J212 Intermediate Technical Japanese 2 J412 Advanced Technical Japanese 2	E021 Interaction Seminar 2 E113 Basic TC 3 E212 Intermediate TC 2 E412 Advanced TC 2 J012B Introductory Technical Japanese 2 J112B Basic Technical Japanese 2
Fri.	M281E Quantum Theory and its application to Solid State Electronics **(Mizuta･Murata･T.Suzuki)**	M283E Biofunction and Organization **(Takagi･Tsukahara･Yuzuru Takamura･Ohki)** E413 Scientific Discussions 2 **(Blake)**			

NOTE:

- Friday, December 4 will follow the WEDNESDAY schedule.

4 Curriculum

Students in the School of Materials Science (MS school) must read both parts of the Institute-wide Study Guide and this guide carefully and thoroughly.

4.1 Outline of the curriculum

Based on JAIST's mission statement, the curriculum of the MS school is designed to help students to systematically progress from the basics of materials science to its advanced frontiers while acquiring fundamental academic skills that will enable them to contribute significantly to the development of cutting-edge science and technology.

It is insufficient for students merely to take lectures with a passive attitude. Students are required to keep in mind that the lectures are intended to assist the learning process in understanding advanced science and technology. To acquire abilities that will benefit them in the future, students must work actively and also independently toward their academic goals. Grades are decided strictly on the basis of the results of examinations or the equivalents in each course. Credits for the course will not be granted when the level of performance is below the prescribed standard.

The courses in the School of Materials Science (MS school courses/Mxxx series) are classified into 4 groups; **Area A**: Materials Characterization and Devices (physics-oriented area), **Area B**: New Materials Design and Synthesis (chemistry-oriented area), **Area C**: Biofunction and Organization (biology-oriented area), and **extra-Area**. Since some courses are offered in different semesters of the same year and some are once every other year, it is advisable for students to make a reasonable study plan while considering their own pace of progress. Students should select courses with the aim of developing a well-balanced all-round academic ability. Further, students must do coursework seriously, because they will be assigned to a laboratory based on their grades, and there are prerequisites of courses to submit a research proposal.

4.2 The courses in the School of Materials Science (MS school courses/Mxxx series)

4.2.1 Introductory courses

The Introductory courses (M1xx series) are designed mainly for students outside of the area of materials science.

The M111A Introduction to Physics A, M112 Introduction to Chemistry, and M113 Introduction to Bioscience are courses to learn fundamentals to prepare for the higher-level courses in the school of Materials Science. Check the section 5.2(1) and 5.3.2 for M111B Introduction to Physics B. Course registration guidance will be provided on the basis of the results of an academic ability test which will be held soon after their enrollment for students admitted to JAIST in April.

4.2.2 Basic courses

The Basic courses (M2xx series) are divided into 3 **Areas**, namely **A**, **B,** and **C**. Each area is composed of fundamental courses (**Group-I**: M21x, M22x, M23x series) and higher-level courses (**Group-II**: M24x, M25x, M26x series). The courses in **Group-I** are generally for students trying out different areas. The courses in **Group-II** are for students to study further in the familiar area. The M281, M282, and M283 courses are offered in English and they are in **Group-II**. Students must select one area as their major one and the other two consequently become a minor area 1 and a minor area 2.

4.2.3 Technical courses

The Technical courses (M4xx series), as specialized high level courses, are appropriate for master's students. They are designed based on the specializations of the faculty members and cover topics from the fundamental to advanced.

4.2.4 Advanced courses

The Advanced courses (M6xx series) are designed mainly for doctoral students, though master's students can take them and earn the credits which can be counted for completion requirements.

These are mainly offered in English. Students are encouraged to plan their course taking carefully considering their future plans.

4.3 Seminar and research

Courses for a major research project (Seminar) and a minor research project (Research) are described below. For doctoral students, a minor research project can be substituted for an internship.

Master's program

Course Number	Course Title	Instructor(s)	Notes
M201	Seminar in Materials Science A (Thesis)	Supervisor	8 credits: compulsory
M202	Research in Materials Science A	Advisor for the Minor Research Project	2 credits: same as above

Note: Seminar in Materials Science A (Thesis) may be substituted for Seminar in Materials Science A (Project Report). 2 credits instead of 8 may be earned for this.

Doctoral program

Course Number	Course Title	Instructor(s)	Notes
M601	Advanced Seminar in Materials Science B	Supervisor	6 credits: compulsory
M602	Advanced Research in Materials Science B1 (Minor Research Project)	Advisor for Minor Research Project	4 credits; compulsory elective course Choose between M602 and M603.
M603	Advanced Research in Materials Science B2(Internship)	Advisor for Internship	

4.4 Curriculum charts

The tables below list course number, course title, course term, instructor(s), area and credits. "J" indicates courses offered in Japanese and "E" in English in the language column.

Note 1: A comma (,) between the names of instructors indicates that each faculty member teach the course in each term, and a middle dot (・) indicates that 2 or more faculty members teach the course taking turns in the same class/term.

Note 2: The M271–272, M431-434, and M631-635 courses are not offered on a regular basis. Information on these courses will be available when they are scheduled. Credits may be recognized on a credit-by-credit basis.

4.4.1 Introductory courses

Course Number	Course Title	Lan-guage	Course Term	Instructor(s)	Area
M111A	Introduction to Physics A*1	J	1-1	Horita	A
M111B	Introduction to Physics B*1, 2	J	1-1	Mizutani	A
M112	Introduction to Chemistry	J	1-1	Taniike・Matsumura	B
M113	Introduction to Bioscience	J	1-1	Takagi・Shimokawa	C

*1 Credits from one of either, but not both, of the courses M111A or M111B can be used to fulfill the degree requirements.

*2 Students who belong to the laboratories in the physics-centered area can take the M111B but cannot use the credits to satisfy the requirements.

4.4.2 Basic courses

Course Number	Course Title	Lan-guage	Course Term				Instructor(s)	Area
M211	Quantum Mechanics	J	1-1		2-1		Murata, Iwasaki	AI
M212	Statistical Mechanics	J			2-1		Shimoda	AI
M213	Electromagnetic Theory	J		1-2			Tomitori	AI
M221	Organic Chemistry	J	1-1				Matsumi	BI
M222	Computational Material Design	J		1-2			Shimoda･Dam	AI
M223	Properties of Organic Materials	J	1-1				Nagao	BI
M224	Inorganic Materials Chemistry	J		1-2			Maenosono	BI
M225	Structure Analysis of Materials	J			2-1		Shinohara	BI
M231	Bioorganic Chemistry	J	1-1		2-1		Fujimoto･Hohsaka	CI
M232	Biofunctional Materials	J		1-2			Hamada	CI
M243	Solid State Physics I	J		1-2			Yukiko Takamura	AII
M245	Mathematics for Condensed Matter Science and Technology	J	1-1		2-1		Koyano, Mizuta	AII
M251	Chemistry of Catalyst and Catalysis	J	1-1				Ebitani	BII
M252	Polymer Design	J			2-1		Yamaguchi・Matsumura	BII
M254	Synthetic Design of Polymers	J		1-2			Kaneko	BII
M261	Functional Biomolecules	J		1-2			Tsutsui	CII
M262	Biomaterial Sensing	J			2-1		Yuzuru Takamura	CII
M281	Quantum Theory and its application to Solid State Electronics*	E				2-2	Mizuta・Murata・T.Suzuki	AII
M282	New Materials Design and Synthesis*	E			2-1		Yamaguchi･Matsumi･Maenosono	BII
M283	Biofunction and Organization*	E				2-2	Takagi･Tsukahara･Yuzuru Takamura･Ohki	CII

* M281, M282, and M283 are offered in English. When students wish to complete their degree only with the courses offered in English, these courses can be counted as the Basic courses to satisfy the degree requirements.

Sub-table

Course Number	Course Title	Course Term	Instructor(s)	Note
M271	Physical Properties of Materials			Offered as necessary
M272	Chemical Functions of Materials			Offered as necessary

4.4.3 Technical courses

Course Number	Course Title	Lan-guage	Course Term	Instructor(s)	Notes	Area
M411	Methods of Instrumental Analysis	J	2-2	Oshima	Offered in alternate years★	A
M412	Composite Materials	J		To be announced	To be announced	B
M413	Extreme Materials	E	2-1	Maenosono･Nagao･Taniike･Mott	Offered in alternate years★	B
M414	Device Physics	J	2-1	Tokumitsu	★	A

M415	Medical Biomaterials	J	1-2	Tsukahara･H.Suzuki	Offered in alternate years★	C
M420	Solid State Physics II	J	2-1	Akabori	★	A
M421	Electronics	J	1-2	T.Suzuki	★	A
M422	Advanced Scientific Computing	J		To be announced	To be announced	A
M423	Functional Protein Device	J	1-2	Hiratsuka	★	C

★ The course is offered in the 2015 academic year. There may be changes in the courses offered next academic year.

Sub-table

Course Number	Course Title	Course Term	Instructor(s)	Notes
M431	Evaluation of Properties of Materials I			Offered as necessary
M432	Evaluation of Functions of Materials I			Offered as necessary
M433	Evaluation of Properties of Materials II			Offered as necessary
M434	Evaluation of Functions of Materials II			Offered as necessary

4.4.4 Advanced courses

Course Number	Course Title	Lan-guage	Course Term	Instructor(s)	Notes	Area
M611	Electronic Structures of Solids and Surfaces	E	1-1	Tomitori･Mizutani･Yukiko Takamura・Fleurence	Offered in alternate years★	A
M612	Optical Properties of Solids	E		Mizutani･Khuat・Murata･Koyano	Offered in alternate years	A
M613	Quantum Phenomena in Condensed Matter	E		Iwasaki･Mizuta	Offered in alternate years	A
M614	Advanced Device Physics	E	2-2	Ohdaira	Offered in alternate years★	A
M615	Advanced Biofunctions	E	1-1	Takagi･Yuzuru Takamura	Offered in alternate years★	C
M616	Advanced Biomaterials	E	2-1*	Hiratsuka・Tsutsui・Hamada・Nagai	Offered in alternate years★	C
M617	Molecular and Functionality Design of Polymers	E		Yamaguchi･Nobukawa･Shinohara･Kaneko	Offered in alternate years	B
M618	Materials Design	E	1-2	Ebitani･Matsumura･Maenosono	Offered in alternate years★	B
M619	Materials Morphology	E		Taniike･Matsumi・Vedarajan	Offered in alternate years	B
M620	Electronic Properties of Condensed Matter	E	2-1*	Murata･Sakai・Koyano・An	Offered in alternate years★	A
M621	Advanced Computational Materials Science	E		To be announced	To be announced	A
M622	Advanced Biomolecular Science	E		Ohki･Osaka	Offered in alternate years	C

★ The course is offered in the 2015 academic year. There may be changes in the courses offered next academic year.

* The courses are offered as intensive courses. See the class schedule for detailed schedule.

Sub-table

Course Number	Course Title	Lan-guage	Course Term	Instructor(s)	Notes	Area
M631	Physics of Materials	E			Offered as necessary	
M632	Chemistry of Materials	E			Offered as necessary	
M633	Advanced Materials Physics	E			Offered as necessary	A
M634	Advanced Materials Chemistry	E			Offered as necessary	B
M635	Advanced Biotechnology	E			Offered as necessary	C

<< Important >>

Please refer to the corresponding sections for the detailed information on how to complete the program as shown in this table.

	Master's program	Doctoral program
5D program	**5 Guide to completion of the master's program**	**6 Guide to completion of the doctoral program**
3D program	---	**6 Guide to completion of the doctoral program**
M program	**5 Guide to completion of the master's program**	---
Mα program	**5 Guide to completion of the master's program**	---

5 Master's program (M, Mα programs and master's part of the 5D program)

The information given below is primarily intended for students enrolled in April. It can also be applied correspondingly to students enrolled in October. Other rules and requirements based on the JAIST regulations and the degree completion regulations which are not specified in this guide are laid out separately.

5.1 Laboratory assignment and Educational programs

See also the sections VII.1 and V.1 in the Institute-wide Study Guide.

(1) Students are temporarily assigned to a laboratory before a formal assignment is made. Using this period to attend courses and visit laboratories students will choose a one to be formally assigned.

(2) Before a fomal assignment to a lab, students must complete at least 2 courses (4 credits) (one course must be from the Basic courses) from the MS school courses, except for the E413 Scientific Discussions II, B411 Advanced Project Management and courses in the Nano Material Technology program. Students who wish to complete the program by taking courses offered only in English (ones with "E" in the chart in the section 4.4, E413 and B411) are eligible to be assigned to a lab after finishing at least 2 courses from the MS school courses except for the E413 and B411. The first formal assignment will be decided in June on the basis of the academic grades given in Term 1-1. The second assignment will be decided in September on the basis of the academic grades given in Term 1-2. The third will be decided in December on the basis of the academic grades given in Term 2-1. Adjustment can be made as necessary.

(3) Students will select one of the three educational programs; M, Mα and 5D programs after they are formally assigned to a laboratory. Students cannot change the program they selected except for the change from M to 5D program. Mα students can apply to shorten their extended period only when they submit a research proposal or when they apply for conferment of a degree.

5.2 Program completion requirements for master's students

Students must first read the Institute-wide Study Guide, the section VI.1.1. Check the Institute-wide Study Guide for information regarding taking the IGE courses, courses from other schools in JAIST or ones at other institutes.

(1) Students in M program and Mα program need to obtain all of the following:

1) 8 credits from Seminar in Materials Science A (Major Research Project)
2) 2 credits from Research in Materials Science A (Minor Research Project)
3) 20 credits (10 courses) or more including the following:
   i) 16 credits (8 courses) or more from the MS school courses (Mxxx series)
   ii) 4 credits (2 courses) or more from the Basic courses (M2xx series) in student's major area including at least 1 course from Group-II (M24x, M25x, M26x).
   iii) 2 credits (1 course) or more from the Basic courses (M2xx series) in the minor area 1, and 2 credits (1 course) or more in the minor area 2. One of them can also be from any of the Introductory/Technical or Advanced courses if the course is in one of the minor areas.The M111B Introduction to Physics B is designed mainly for students from outside of the area of physics. Either M111A or M111B can be used to fulfill the requirements for a master's degree. Students who belong to the laboratories of the physics-centered area can take the M111B but cannot use the credits to satisfy the requirements.

When students wish to satisfy the requirements of the MS school courses (Mxxx series) by taking only the courses given in English (M281, M282, M283, and Advanced courses), one of the Advanced courses can be considered as the Basic courses (M21x, M22x, M23x series) in Group-I of the same area. The Basic courses conducted in Japanese cover the contents of those conducted in English. Students cannot use credits obtained from both of the Basic courses conducted in English and ones in Japanese to satisfy the requirements for the Basic courses.

4) Note that the Nano Material Technology courses can be used to fulfill the requirements without

specific areas assigned to them.

(2) Requirements for students in 5D program

1) As described in 5.2(1) for completion of master's program
2) All of the following to continue on to the doctoral program:
   i) At least 18 credits (9 courses) from the MS school courses. 2 credits (one course) from the Introductory courses can be included in the 18. When the number of credits earned from the Basic, Technical, and Advanced courses exceed 10 (5 courses), the excess of up to 8 credits (4 courses) can be transferred and recognized as credits earned in the doctoral program. See the section VI.6 in the Institute-wide Study Guide.
   ii) 4 credits (2 courses) or more from the courses in the IGE.
   iii) One of the following 3 conditions of English proficiency:
      a. Those who completed one or more of E2xx or E4xx courses.
      b. Those who have taken the TOEIC within 2 years prior to their application for admission and scored higher than the score required by each school.
      c. Those who have submitted a master's thesis or project report in English and passed the exam.

5.2.1 Guidelines for taking courses in the School of Materials Science

See the Institute-wide Study Guide, the section VI.2. See also the section 4.2 the MS school courses. Very few courses are offered in the MS school in Term 2-2 and students are advised to plan their course taking carefully. The courses scheduled to be offered in the next academic year may change.

5.2.2 Seminar (Major Research Project) and Research (Minor Research Project) (compulsory)

(1) Number of credits

10 credits (2 courses) will be given when students complete:
Seminar in Materials Science A (Thesis) (8 credits) as Major Research Project
Research in Materials Science A (2 credits) as Minor Research Project

*4 credits (2 courses) will be given when students complete:
Materials Science A (Project Report) (2 credits) as Major Research Project
Research in Materials Science A (2 credits) as Minor Research Project

*Master's research project

Students who choose to work on a research project instead of a thesis must have an overall grade-point average in the MS school courses in the top third of the students of the same year in the school and have a faculty meeting approval that their project report meets the objectives of the school. They must satisfy the program completion requirements (see the section 5.2) and also acquire additional 6 credits (3 courses) except for the Introductory courses from the MS school courses.

(2) Course style

The style of instruction for Seminar and Research is done by giving research guidance for a thesis or a project report.

5. 3 Research supervision and guidance

5.3.1 Laboratory assignment

See the Institute-wide Study Guide, VII.1 and the section 5.1(2) for requirements for assignment. See also VII.3 in the Institute-wide Study Guide for Multiple Supervisory System.

5.3.2 Research project

(1) Major Research Project

1) Students must choose a research theme for a major research project and submit a research proposal to the dean via the Educational Service Section, Educational Affairs Department (hereinafter “Kyoumu”) in their 1st year by the specified deadline.
2) Requirements for submitting a research proposal
   - Students must obtain at least 8 credits (4 courses) from the MS school courses, in 2 Areas (a major area and a minor area 1) from the Basic courses before proposal submission. Note that students who belong to the physics-centered laboratories cannot use the credits from M111B Introduction to Physics B to satisfy this requirement.
   - The contents of a research proposal must be acceptable.
3) Beginning of the research
   Students can formally begin a major research project just after a research proposal is accepted and approved by their 3 advisors.
4) Length of research period
   At least one year is required to spend to complete a major research project.

(2) Minor Research Project

Students are strongly encouraged to choose a research topic for a minor research project from a different area from their main research field, though it is acceptable to have a topic from the same area. An advisor for Minor Research Project will be decided in October. Students must begin a minor research project at the end of Term 2-1 (early December) in their 1st year, and must complete it by the end of September of their 2nd year. The thesis of a minor research project must be submitted to the dean before the end of the following October, and it must be attached to the master’s thesis as its supplement.

5.4 Degree conferment

See the Institute-wide Study Guide, the section VIII.1 for the detailed information.

5.4.1 Schedule pertaining to conferment of degree and procedures

		March Completion	June Completion	September Completion	December Completion
Research proposal	**Prerequisite**	See 5.3.2(1)ii).			
	Submission period	By the end of March of the previous year	By the end of June of the previous year	By the end of September of the previous year	By the end of December of the previous year
Submission of thesis of minor research project		By the end of October of the previous year	By the end of January	By the end of April	By the end of July
Application for conferment of degree		The end of January	The end of April	The end of June	The end of October
Submission of thesis		Early February	Early May	Mid-August	Early November
Thesis defense		Mid-February	Mid-May	Late August	Mid-November
Conferment of degree		March	June	September	December

5.5 Other

5.5.1 Assistance and recommendation for employment

Recommendation for employment can only be given if students:

(1) have a realistic chance of obtaining credits necessary for completion of the program.
(2) have consulted with their supervisor and have acquired the approval.
(3) have taken the SPI (Synthetic Personality Inventory) Test held in JAIST twice or more.

(4) have registered themselves in the “JAIST Career Support System” and have filled in with all the necessary information, which will be evaluated for the decision for recommendation.

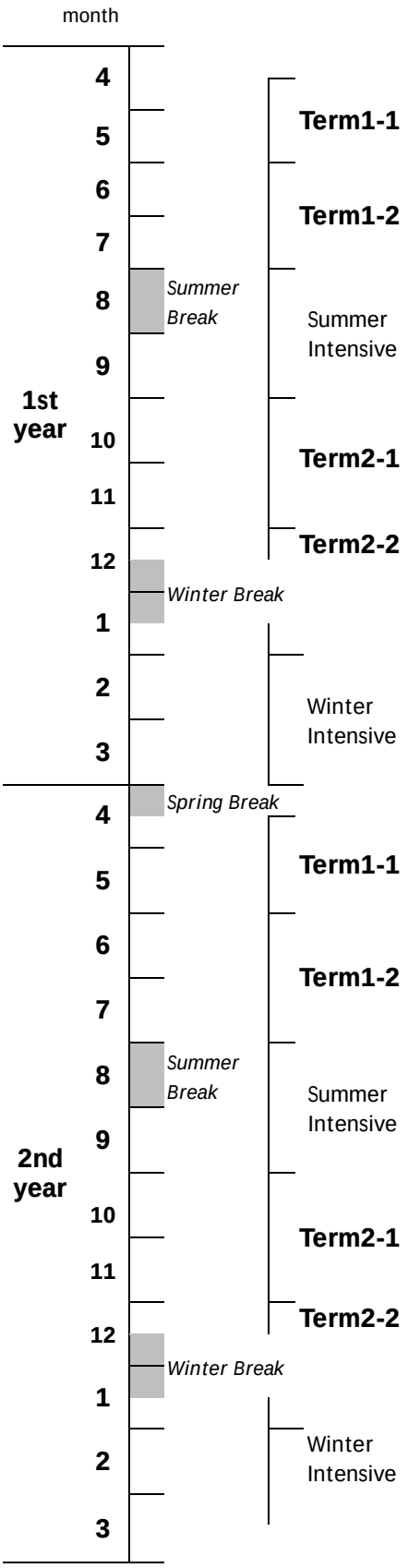
5.5.2 Teaching certificate

See the section IX.4 in the Japanese-language version of the Institute-wide Study Guide.

5.5.3 Continuing on to the doctoral program

See the section IX.2 in the Institute-wide Study Guide.

Master's program schedule



Procedures for assignment to laboratories and a research project

- Temporary assignment to a laboratory
- Submission of the Study Plan/Record for the 1st year **(Mid-April)**
- Submission of an application for laboratory assignment **(Early June)**
- Laboratory assignment

- Assignment to an advisor for Minor Research Project

Seminars / Research

- Start of a research proposal
- Start of a minor research project **(Early December)**
- Research plan presentation
- Carrying out Minor Research Project
- Submission of a research proposal
- Submission of the Study Plan/ Record for the 2nd year **(Mid-April)**
- Carrying out Major Research Project
- Mid-term presentation
- Submission of an application for the doctoral program **(First submission: Early July)**
- Completion of the Minor Research Project
- Submission of an application for the doctoral program **(Second submission: Early January)**
- Submission of an application for degree conferment **(End of January)**
- Submission of master's thesis **(Mid-February)**
- Degree conferment **(March)**

6 Doctoral program (3D program and doctoral part of the 5D program)

The information given below is primarily prepared for students enrolled in April. It can also be applied correspondingly to students enrolled in July and October. Other rules and requirements based on the JAIST regulations and the degree completion regulations which are not specified in this guide are laid out separately.

6.1 Program completion requirements for doctoral students

Students must read the Institute-wide Study Guide, the sections VI.1.2 and VI.2 regarding the program completion requirements and course registration.

6.1.1 Course requirements

Check the Institute-wide Study Guide for information regarding taking the IGE courses, courses from other schools in JAIST or ones at other institutes.

Students need to obtain all of the following:

(1) 6 credits from Advanced Seminar in Materials Science B (Major Research Project)

(2) 4 credits from Advanced Research in Materials Science B1 (Minor Research Project)
or Advanced Research in Materials Science B2 (Internship)

(3) 10 credits (5 courses) or more in 2 Areas from the Advanced courses.
The Basic courses (except M281-283) and the Technical courses other than courses not completed during the master's program are considered Advanced courses in the same area and can be used to fulfill the requirements for the doctoral program but at least 4 credits (2 courses) from the Advanced courses (M6xx series with areas A, B or C) must be taken and completed during the period in the doctoral program.

(4) The credits of the Advanced courses in Nano Materials (N006-008) can be used as the Technical courses (M4xx) to fulfill the degree requirements. Note that the credits of the Basic courses in Nano Technology (N001-005) are regarded as those of the Introductory courses, so they cannot be used to fulfill the degree requirements.

(5) When 5D program students have obtained 18 credits (9 courses) from the Basic, Technical, and Advanced courses in the master's program, taking 1 more course (2 credits) from the Basic, Technical and Advanced courses in the doctoral program (except M601, M602 and M603) will satisfy the degree completion requirements of the doctoral program according to the section VI.6 in the Institute-wide Study Guide. Students must double check the necessary number of credits and if all the requirements mentioned above in this section are met.

6.2 Research supervision and guidance

6.2.1 Laboratory assignment and supervisor

See the section VII.1 in the Institute-wide Study Guide. See also the section VII.3 for the multiple supervisory system.

6.2.2 Seminar (Major Research Project) and Research (Minor Research Project) (compulsory)

The style of instruction for Seminar and Research is done by giving research guidance for a doctoral dissertation.

(1) Major Research Project

A major research project focuses on a subject within student's area of specialization.

1) A research proposal must be submitted to the dean via Kyoumu within 1 year after student's enrollment in the doctoral program. A research proposal for a minor research project/an internship must have been approved before this.
Student's three advisors must approve of the proposal before their submission.

2) A dissertation outline must be submitted no later than 6 months before the submission of a dissertation to Kyoumu. Students must get approvals from their 3 advisors before submitting it

to Kyoumu.

(2) Minor Research Project

A minor research project must be in an area outside student's specialty or related but different area of a major research project.

1) A research proposal for a minor research project must be submitted within 1 year after students' enrollment in the doctoral program to the dean and get an approval from the dean.
2) A minor research project must be conducted under the guidance of an advisor other than the supervisor and the second supervisor.
3) A minor research project (the period should be for approximately 6 months) must be completed before submission of an application for a preliminary defense of a doctoral dissertation.
4) A thesis of a minor research project must be bound and submitted to the dean via Kyoumu.

(3) Minor Research Project (Internship)

Internships are conducted at companies and other places for a period longer than 3 months.

1) Students must first consult with their supervisor and submit a research proposal for an internship to the dean and get an approval from the dean within 1 year after students' enrollment in the doctoral program.
2) Students must go to the Career Support Section and take an appropriate procedure.
3) An internship and the submission of a report must be completed before submitting an application for preliminary defense. Students must attach an evaluation from the company where the internship was conducted with the report and submit them to their advisor for Internship.

6.2.3 Off-campus research and internship

Students in the 3D and 5D programs are encouraged to carry out advanced research at other research institutions in Japan or abroad, or to do an internship at companies. Detailed information regarding financial support, see *HANDBOOK for Students*.

When an off-campus activity is approved as a minor research project, students may earn credits for M602 Advanced Research in Materials Science B1. When an off-campus activity is approved as an internship, students earn credits for M603 Advanced Research in Materials Science B2. Other activities are regarded as a part of a major research project, M601 Advanced Seminar in Materials Science B.

See the Institute-wide Study Guide, the section VII.4 for the necessary procedures.

6.3 Degree conferment

See the Institute-wide Study Guide, the section VIII.2

6.3.1 Schedule pertaining to conferment of degree and procedures

	March Completion	June Completion	September Completion	December Completion
Research proposal for minor research project/internship	By the end of February in their 1st year	By the end of May in their 1st year	By the end of August in their 1st year	By the end of November in their 1st year
Research proposal for major research project	Must be submitted within 1 year after enrolling in the doctoral program			
Dissertation outline	Early July of the previous year	Early October of the previous year	Early January	Early April
Minor research project or internship	Must be completed before applying for the preliminary defense			
Application for preliminary defense	Early October of the previous year	Early January	Early April	Early July
Dissertation draft	To be distributed to the members of the preliminary defense committee at least 2 weeks before the preliminary defense			
Preliminary defense	December	March	June	September
Application for degree	Early January	Early April	Early July	Early October
Formal hearing, oral defense, final examination	Early February	Early May	August	Early November
Conferment of degree	March	June	September	December

6.4 Doctoral program schedule toward degree completion

The table below is a standard schedule for doctoral students enrolled in April and intending to complete their program in 3 years.

Category	Submitted to / Note	Period
Research proposal for minor research project/ internship	The dean	by the end of February in their 1st year
Research proposal for major research project	The dean via Kyoumu Submission must be after getting an approval from all 3 advisors Kyoumu	by the end of February in their 1st year by the end of March in their 1st year
Minor research project/ internship	Kyoumu Thesis (for minor research) should be bound.	Must be completed before the submission of application for preliminary defense
Dissertation outline	Kyoumu	by the early July in their 3rd year
Application for preliminary defense	A title of a dissertation and an outline of main publications must be submitted to the dean via Kyoumu	Early October
Dissertation draft	Should be distributed to 5 or more members of the Doctoral Dissertation Preliminary Examination Committee	at least 2 weeks before the preliminary defense
Preliminary defense		December
Application for conferment of degree	The President via Kyoumu Only after a successful preliminary defense	Early January
Selection of members of the doctoral dissertation examination committee		January

Formal hearing, oral defense and final examination		Early February
Decision results on conferment of degree		February
Submission of dissertation and abstract	Kyoumu After a successful oral defense	By the degree conferment day
Conferment of degree		Late March

7 Courses at other graduate institutions

See the Institute-wide Study Guide, the section VI.7.

Nano Material Technology Program

Nano Material Technology Program

The Center for Nano Materials and Technology (CNMT) strives to support and advance education and research in the fields of nano-materials and nanotechnology in cooperation with the School of Materials Science.

Operation and maintenance of research facilities and machines

Our center houses highly specialized research facilities and large research instruments. We maintain the facilities and instruments to assist research work at the highest global standards. The special research facilities include a large clean room, machine shop, and helium liquefaction system. The large instruments include an 800 MHz nuclear magnetic resonance spectrometer, FT-ICR mass spectrometers, a superconductive electron interferometer, an X-ray photoelectron spectroscopy system, an X-ray analyzer, an electron probe micro-analyzer, a Rutherford backscattering analysis and high-energy ion implantation system, an electron beam exposure apparatus, a molecular beam epitaxy system, and transmission and scanning electron microscopes.

Research assistance to faculty and students

We offer guidance on the operation of the center's large instruments and machine tools, collaboration in experiments, the analysis of data, and sample analysis on request to help and advance research being conducted in nanotechnology. We also give guidance sessions on our facilities and instruments, and provide safe training sessions.

Support for joint research projects

The center has a support system to encourage intramural, interior and joint international research projects and holds regular international conferences and workshops to publicize the results of those projects.

Development of researchers and technologists

The Nano Material Technology Program aims to create leading researchers and technologists in the field of advanced nanotechnology-based science. The well-organized course curricula together with our state-of-the-art facilities enable students to systematically acquire practical technology skills.

Nano Material Technology Program

<Goal>

The Center for Nano Materials and Technology (CNMT) opened in April 2002 after the reorganization of the former Center for New Materials, which was originally established as one of the facilities for common use at JAIST.

The purpose of the Nano Material Technology Program, which is managed by the CNMT, is to help students acquire broad and high-level knowledge and experimental techniques in nanotechnology and play an important role in companies and/or research laboratories.

1 Start time

The course starts at the beginning of each term.

2 Course enrolment

JAIST students can enroll in these courses through the standard course enrollment procedures. Please contact the Educational Services Section for details concerning the necessary procedures. Since there are some restrictions to take the Basic Courses in Nano-Technology, please refer to the section 6 below.

3 Courses

Field	Course Title	Course Term	Instructor(s)	Credits
Basic Courses in Nano-Technology (with training courses of related experiments)	N001 Fabrication of Nano-Devices with Training Course	2-1	T.Suzuki・Akabori	2
	N002 Study on Nanobiotechnology with Training Course	2-1	Tsukahara・Yuzuru Takamura・H.Suzuki・Phan	2
	N003 Analysis of Nano-Materials with Training Course	2-1	Ohki・Osaka・Umetsu	2
	N004 Structural Analysis of Solids on Nano-Scale with Training Course	2-1	Maenosono・Mott・Tomitori・Sasahara	2
	N005 Material Analysis with Training Course	To be announced	To be announced	2
Advanced Courses in Nano-Materials	N006 Nano IT Materials	1-2	Mizutani・T. Suzuki・Tokumitsu・Masuda・Kaneko・Yamaguchi	2
	N007 Nano Biodevice Materials	1-2	Tsukahara・Ohki・Fujimoto・Hohsaka・Hiratsuka	2
	N008 Nano Quantum Device Materials	1-2	Akabori・Iwasaki・Horita・Murata・Mizuta・Yuzuru Takamura	2

4 Course requirements

To satisfy the requirements for the Nano Material Technology Program, students must complete a total of 4 or more courses (more than 8 credits), including at least 1 course (2 credits) from the Basic courses in Nano-Technology and at least 1 course (2 credits) from the Advanced courses in Nano-Materials. A certificate of completion for the Nano Material Technology Program will be awarded to students who have acquired the required number of credits.

5 Chart of credit transfer

Field	Knowledge Science	Information Science	Materials Science
Basic courses in Nano-Materials	Liberal Arts courses in the IGE	Liberal Arts courses in the IGE	Introductory courses (M1xx)
Advanced courses in Nano-Materials		Liberal Arts courses in the IGE*	Technical courses (M4xx)

* Acquired credits cannot be used to fulfill requirements.

6 Course outlines

● Basic courses in Nano-Technology (N001 - N005)

A remarkable feature of the Basic courses in Nano-Technology is training through which students can deepen and exercise knowledge learned in lectures. Therefore, as a general rule, absence from lectures is not permitted. Priority should be given to the main courses of each school held in the morning; therefore, the training is to be taken when students have sufficient time. The period of training depends on the progress made in the course. The number of participants is limited to approximately 5 per course and may be adjusted. To ensure that these courses are meaningful, students must first complete the courses at each school. Then, as a rule, among those wishing to take the training, students whose schooling is longest have priority.

N001 Fabrication of Nano-Devices with Training Course
Training: Lithography (UV, EB) and Measurement methods for nano-scale semiconductor devices

N002 Study on Nanobiotechnology with Training Course
Training: Gene amplification, Base-sequence analysis, Electrophoresis, Protein analysis and Nano-biodevices

N003 Analysis of Nano-Materials with Training Course
Training: NMR and Mass spectrometry

N004 Structural Analysis of Solids on Nano-Scale with Training Course
Training: XRD, TEM and SPM.

N005 Material Analysis with Training Course
Training: To be announced.

● **Advanced courses in Nano-Materials** (N006 - N008)

N006 Nano IT Materials
Lecture: Optical fibers, Semiconductor communication devices, Photonics materials, and Display devices.

N007 Nano Biodevice Materials
Lecture: NMR, DNA, Protein, Sugar, and Informatics
* The credits of M415 Medical Biomaterials offered in the School of Materials Science can be substituted for the credits of this lecture, N007 Nano Biodevice Materials.

N008 Nano Quantum Device Materials
Lecture: Semiconductor quantum device, Thermal quantum devices, Inorganic and organic quantum devices, Bio quantum devices, and Advanced nano devices.

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