Degree Completion Guide 2021-2022

JAIST
JAPAN
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SCIENCE AND TECHNOLOGY
1990

# Degree Completion Guide

Graduate School of Advanced Science and Technology
(Division of Transdisciplinary Sciences)

## 2021-2022

JAPAN ADVANCED INSTITUTE OF
SCIENCE AND TECHNOLOGY

JAPAN ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY

# Challenge of the Transdisciplinary Sciences

- Development of Graduate Education for Transdisciplinary Sciences -

Japan Advanced Institute of Science and Technology and Kanazawa University launched a collaborative educational initiative for graduate education with the aim of cultivating human resources of innovative science and technology in Japan who are capable of leading today's society where it is not easy to predict the future, based on great ideas and ability to realize them.

In order to create new knowledge which can be described as the source of innovative science and technology, it is essential to adopt a perspective of integrating different scientific disciplines (transdisciplinary sciences). Inspirations for genuine innovations will come to those who have a thorough knowledge of their own major field but do not limit themselves within the framework, willingly learn, adopt and practice the methodologies and perspectives of other fields for fearless personal transformation.

As part of our educational mission, we strive to explore and practice the methodology of integrating multiple scientific disciplines and progress the integration under the framework beyond the existing scientific disciplines in order to solve complex social problems. We have the education system, contents, methods and such based on this educational mission.

Creation of new knowledge and innovative science and technology cannot be achieved overnight. However, challengers with strong motivation to create new knowledge using the power of transdisciplinary sciences are strongly desired in today's society where there is a mountain of various problems at both regional and global levels.

We would like to invite you to open the door for "new knowledge" together.

President, Japan Advanced Institute of Science and Technology

TERANO Minoru

President, Kanazawa University

YAMAZAKI Koetsu

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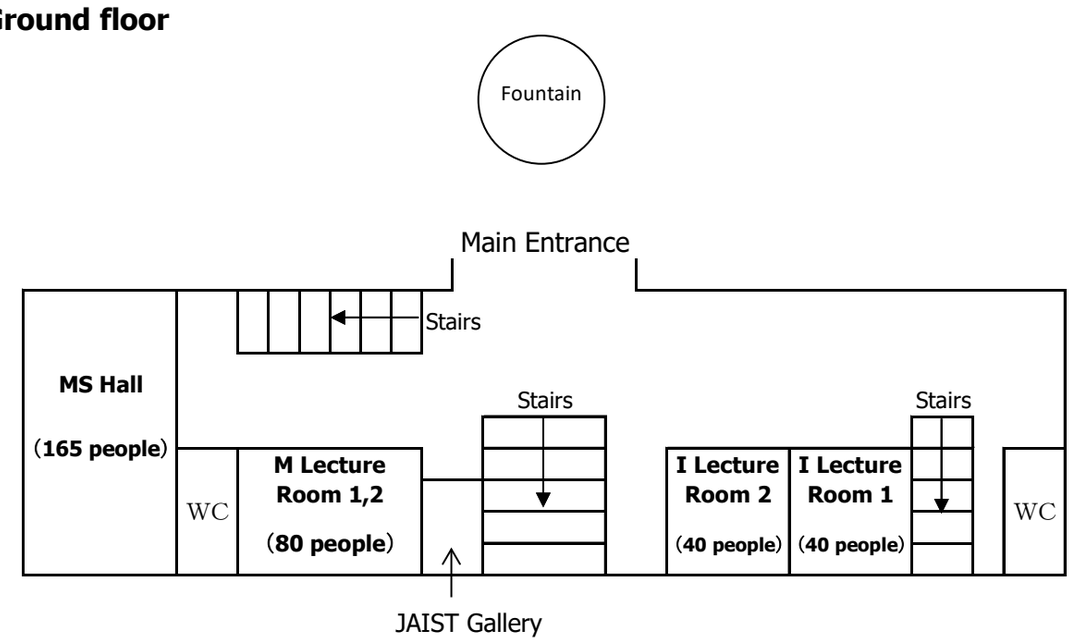
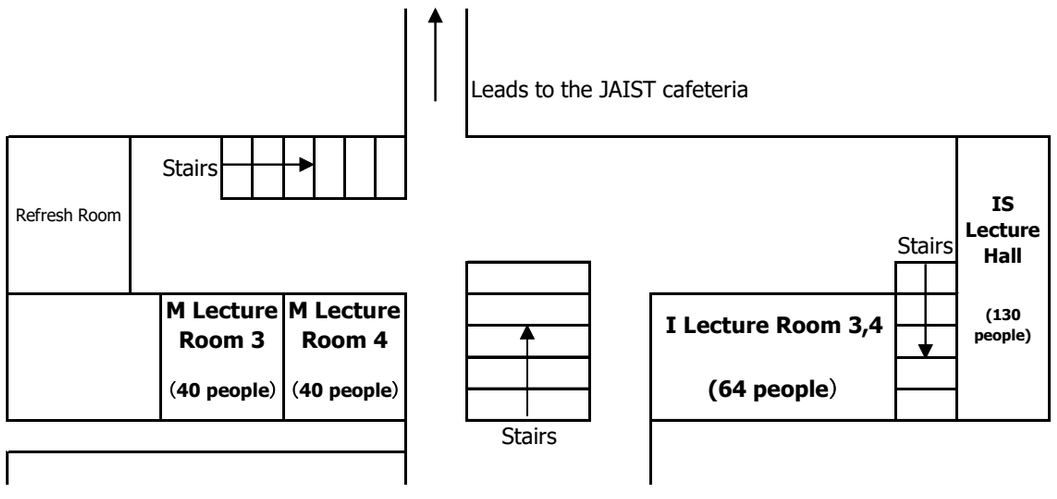
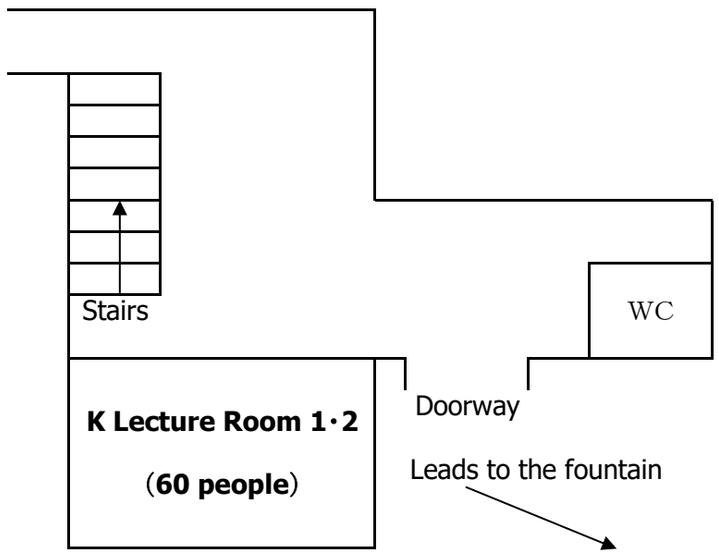



### First floor




## ○KS Lecture Hall

### Ground floor

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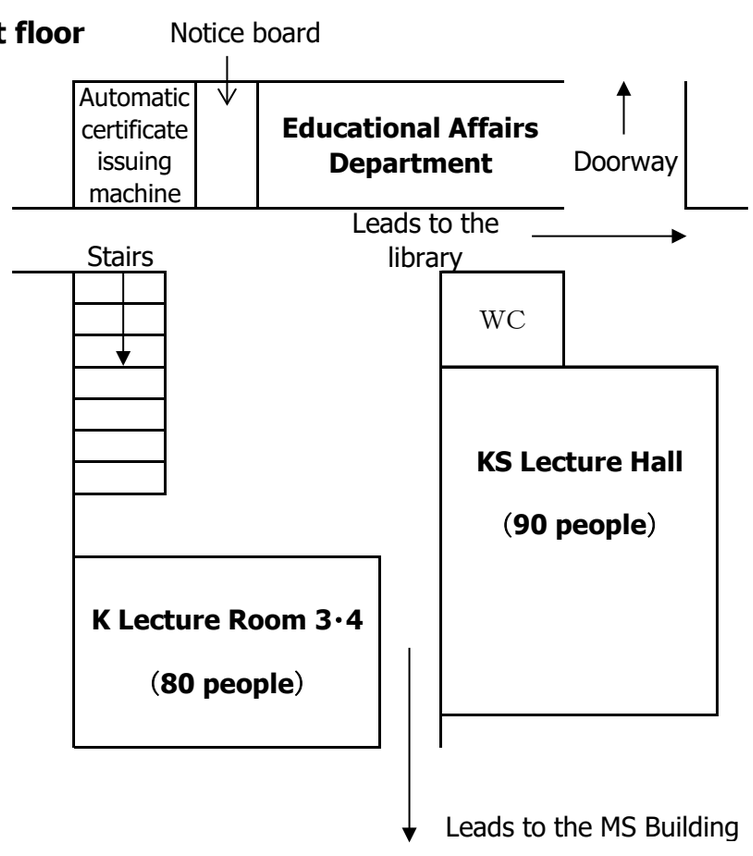

## I. Educational Mission, Goals, Human Resource Development, Degree and Policies of Division of Transdisciplinary Sciences

Japan Advanced Institute of Science and Technology (hereinafter referred to as JAIST) and Kanazawa University have organized a collaborative educational program and established the Division of Transdisciplinary Sciences (hereinafter referred to as the collaborative program) in the Graduate School of Advanced Science and Technology at JAIST and in the Graduate School of Frontier Science Initiative at Kanazawa University respectively, with the aim of cultivating "doctoral human resources who are capable of establishing a foundation for innovative science and technology with unique ideas and outstanding research ability and applying it to the society in corresponding to the global needs and trend." (hereinafter referred to as human resources of innovative science and technology).

### ● Educational Mission and Goals

JAIST and Kanazawa University define that the source of innovation originates from the creation of new knowledge and focus on progress of transdisciplinary sciences as a consistent educational mission in order to cultivate human resources of innovative science and technology.
"Progress of transdisciplinary sciences" is defined as "progressing the integration of multiple scientific disciplines while exploring and practicing the methodology beyond the existing framework of scientific disciplines in order to solve complex social problems relevant to innovative science and technology" and our educational system is structured based on this definition.

### ○ Framework of three innovative challenges (3 challenges)

This collaborative program consists solely of one division instead of offering multiple courses to realize the educational mission above. On the other hand, the framework of three innovative challenges as described below (3 challenges) has been set by consolidating the strengths and characteristics of the two universities in order to surpass the existing scientific disciplines towards solving complex social problems.

I: Life Innovation (Innovation of healthy and high-quality lifestyle)
→ Measurment, analysis and control of biological functions that contribute to healthy living conditions for individuals and its application

II: Green Innovation (Creation of next-generation materials, devices and energy compatible with environment)
→ Generation, storage and transportation of the natural / renewable energy
Development of the energy-saving devices using new materials and nanotechnology

III: Systems Innovation (Building a future life where human and its society coexist with science and technology)
→ Development of intelligent systems utilizing big data and artificial intelligence (AI)
Development of systems and machinery inspired by living organisms
Improvements in social environment considering the natural or cultural aspect

### ○ Four "Forces" (Force)

In this collaborative program, we are convinced that, in order to explore and practice the methodology to integrate sciences, the Force to leap into different research fields other than one's own and communicate with others from different backgrounds must be acquired. Although it is difficult to define the Force in one definition, the following four Forces have been set as an underlying foundation.

Force 1: The"Force" for Data analysis
Force to conduct multifaceted analysis of data that represents a phenomenon from a perspective of scientific disciplines that are to be integrated

Force 2: The"Force" for Modeling
Force to propose a model that is consistent with the foundation of transdisciplinary fields

Force 3: The"Force" for Visualization
Force to present an illustration that is easy to understand for people from other fields

Force 4: The"Force" for Designing

Force to solve problems while improving one's own proposals through interactions with other fields and the society

Based on this four Forces, students in this collaborative program are required to choose one challenge from the framework of three innovative challenges (3 challenges) and study the curriculum systematically according to the chosen challenge with guidance from a team of advisors. Also, students are expected to explore and practice the methodology to integrate sciences with the four Forces as a foundation, generate new ideas with different knowledge or from different perspectives, and progress a research topic set by the students themselves while proactively interacting with people of various backgrounds such as faculty members, students and working professionals. In addition to that, students are expected to become valuable human resources of innovative science and technology which is the goal of this collaborative program by acquiring five types of competency defined as "Learning Achievements" in the Diploma Policy below.

● **Human Resource Development**

Doctoral human resources that are capable of creating a foundation of innovative science and technology based on unique ideas and outstanding research ability and applying it to the society according to the needs and trends of the global society.

● **Degree**

Degrees conferred in this collaborative program and the titles of degree are as below.

| | |
|---|---|
| Master's Program | |
| Master's Degree (Transdisciplinary Sciences) | Master of Philosophy (MPhil) |
| Doctoral Program | |
| Doctoral Degree (Transdisciplinary Sciences) | Doctor of Philosophy (Ph.D) |
| Doctoral Degree (Science) | Doctor of Philosophy in Science |
| Doctoral Degree (Engineering) | Doctor of Philosophy in Engineering |

● **Policies**

The following policies are established in this collaborative program to advance the education for our students.

# Diploma Policy
# (Division of Transdisciplinary Sciences)

In the master's course, students are required to acquire the five abilities and competencies listed in the "academic achievement" below through the pursuit and practice of a "Methodology for Transdisciplinary Science" based on the four forces listed as the educational philosophy. The degree of "Master of Philosophy" is conferred on students who have mastered these competencies, enrolled in the program for a specified period of time, earned the specified number of credits, and then have passed either the Master Thesis Examination and the Final Examination or the Ph.D. Qualifying Examination.

1) Ability to contribute to solve social problems related to science, technology and innovation
2) Knowledge and practical skills related to your discipline
3) Motivation and ability to be actively involved in the other discipline than your discipline
4) Ability to understand academic papers and give brief presentation about your research in foreign language
5) Research ethics of science, technology and life

In the doctoral course, students are required to acquire the 1-5 and 6 or 1-5 and 7 abilities and competences listed in the “academic achievement” below through the pursuit and practice of a “Methodology for Transdisciplinary Science” based on the four forces listed as the educational philosophy. The doctoral degree is conferred on students who have mastered these competencies, enrolled in the program for a specified period of time, earned the specified number of credits, and then have passed the Doctoral Dissertation Examination. Among the students mentioned above, those who have acquired the 1-5 and 6 are conferred a doctoral degree “Doctor of Philosophy” and those who have acquired 1-5 and 7 are conferred doctoral degree “Doctor of Philosophy in Science” or “Doctor of Philosophy in Engineering”.

1) Ability to identify, structure and solve the social problems related to science, technology and innovation
2) Cutting-edge knowledge and practical skills related to your discipline
3) Ability to utilize knowledge and technology of other disciplines for your discipline
4) Ability to present and discuss your research in foreign language in an international conference or a joint research in overseas
5) Practical research ethics of science, technology and life
6) Ability to integrate your discipline with other disciplines and create new knowledge
7) Ability to create new knowledge based on your discipline

# Curriculum Policies
# (Division of Transdisciplinary Sciences)

In order to have students obtain academic achievement which is described in Diploma policy under the framework of three challenges listed in the division's mission, the curriculum of the Division of Transdisciplinary Science is oriented as problem-solving and is systematic based on what students are required to acquire from the program. Specifically, the following courses are designed as a systematically-assigned curriculum.

Master's Program

1) Systematically Specialized Courses and Research Support Courses for students to acquire and utilize basic knowledge about your discipline
2) Transdisciplinary Experience Courses based on cross-disciplinary research such as a cross-disciplinary seminar and group work and research in the other discipline
3) Social Implementation Courses for practical education based on social needs
4) Core Courses to foster basic knowledge and attitude toward creation of innovation

Doctoral Program

1) Systematically Specialized Courses and Research Support Courses to deepen the knowledge about your discipline
2) Transdisciplinary Experience Courses based on cross-disciplinary research such as a cross-disciplinary seminar and group work and research in the other discipline
3) Social Implementation Courses for practical education based on social needs
4) Courses such as internship in overseas or study abroad to foster global mind

## Ⅱ.Academic Calendar 2021-2022

【JAIST】

| | | |
|---|---|---|
| First Semester (April 1 - September 30) | April 1 (Thu) | Spring Break |
| | April 2 (Fri) | Entrance Ceremony |
| | April 3 (Sat) | Orientation at Tokyo Satellite |
| | April 5 (Mon) - April 9 (Fri) | Orientation at Ishikawa Campus |
| | April 12 (Mon) - June 3 (Thu) **NOTE*** | Class Term 1-1 |
| | June 4 (Fri) - June 8 (Tue) | Examination Term 1-1 |
| | June 9 (Wed) | Safety Guidance |
| | June 10 (Thu) | No Class Day |
| | June 11 (Fri) - August 2 (Mon) | Class Term 1-2 |
| | August 3 (Tue) - August 4 (Wed) | Examination Term 1-2 |
| | June 24 (Thu) | Degree Conferment Ceremony |
| | August 5 (Thu) - September 30 (Thu) | Summer Intensive |
| | August 5 (Thu) - August 31 (Tue) | Summer Break |
| | August 12 (Thu) - August 16 (Mon) | School Office Closed (Summer Break) |
| | September 24 (Fri) | Degree Conferment Ceremony |
| | **NOTE* July 19 follows the Thursday schedule.** | |
| Second Semester (October 1 - March 31) | October 1 (Fri) | School Office Closed (JAIST Anniversary) |
| | October 4 (Mon) | Entrance Ceremony |
| | October 2 (Sat) | Orientation at Tokyo Satellite |
| | October 5 (Tue) - October 11 (Mon) | Orientation at Ishikawa Campus |
| | October 12 (Tue) - December 1 (Wed) | Class Term 2-1 |
| | December 2 (Thu) - December 6 (Mon) | Examination Term 2-1 |
| | December 7 (Tue) | No Class Day |
| | December 8 (Wed) - February 4 (Fri) **NOTE**** | Class Term 2-2 |
| | February 7 (Mon) - February 8 (Tue) | Examination Term 2-2 |
| | December 24 (Fri) | Degree Conferment Ceremony |
| | December 25 (Sat) - January 4 (Tue) | Winter Break |
| | December 29 (Wed) - January 3 (Mon) | School Office Closed (Winter Break) |
| | February 9 (Wed) - March 31 (Thu) | Winter Intensive |
| | March 24 (Thu) | Degree Conferment Ceremony |
| | **NOTE** January 6 follows the Tuesday schedule.<br>January 7 follows the Monday schedule.<br>January 12 follows the Monday schedule.** | |

**Period for Registration and Change of Courses at Ishikawa Campus**

| Terms | Period for Rregistration and Course Change |
|---|---|
| Term 1-1 | April 12 (Mon) - April 23 (Fri) |
| Term 1-2 | June 11 (Fri) - June 24 (Thu) |
| Term 2-1 | October 12 (Tue) - October 25 (Mon) |
| Term 2-2 | December 8 (Wed) - December 21 (Tue) |

# 2021-2022 Official Academic Calendar (Quarter System)【Kanazawa University】

## 1st Quarter & 2nd Quarter

| Week/ Month | Sun. | Mon. | Tue. | Wed. | Thu. | Fri. | Sat. | |
|---|---|---|---|---|---|---|---|---|
| 4 | 28 | 29 | ① | ② | | ③ | 3 | |
| | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Q1 |
| | 11 | 12 | 13 | 14 | 15 | 16 | 17 | |
| | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |
| 5 | 25 | 26 | 27 | 28 | 29 | 30 | 1 | |
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| | 9 | 10 | 11 | 12 | 13 | 14 | 15 | |
| | 16 | 17 | 18 | 19 | 20 | 21 | 22 | |
| | 23 | 24 | 25 | 26 | 27 | 28 | 29 | |
| 6 | 30 | 31 | 1 | 2 | 3 | ④ | 5 | |
| | 6 | ④ | | | 10 | 11 | 12 | Q2 |
| | 13 | 14 | 15 | 16 | 17 | 18 | 19 | |
| | 20 | 21 | 22 | 23 | 24 | 25 | 26 | |
| 7 | 27 | 28 | 29 | 30 | 1 | 2 | 3 | |
| | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | 11 | 12 | 13 | 14 | 15 | 16 | 17 | |
| | 18 | 19 | 20 | 21 | 22 | 23 | 24 | |
| | 25 | 26 | 27 | 28 | 29 | 30 | 31 | |
| 8 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
| | 8 | 9 | 10 | 11 | 12 | 13 | 14 | |
| | 15 | 16 | 17 | 18 | 19 | 20 | 21 | |
| | 22 | 23 | 24 | 25 | 26 | 27 | 28 | |
| 9 | 29 | 30 | 31 | 1 | 2 | 3 | 4 | |
| | 5 | 6 | 7 | 8 | 9 | 10 | 11 | |
| | 12 | 13 | 14 | 15 | 16 | 17 | 18 | |
| | 19 | 20 | 21 | 22 | 23 | 24 | 25 | |
| | 26 | ⑤ | 28 | 29 | 30 | | | |
| Class* | | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | times | |
| Exam* | | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | times | |

## 3rd Quarter & 4th Quarter

| Week/ Month | Sun. | Mon. | Tue. | Wed. | Thu. | Fri. | Sat. | |
|---|---|---|---|---|---|---|---|---|
| 10 | 26 | 27 | 28 | 29 | 30 | ⑥ | 2 | Q3 |
| | 3 | 4 | 5 | 6 | 7 | 8 | 9 | |
| | 10 | 11 | 12 | 13 | 14 | 15 | 16 | |
| | 17 | 18 | 19 | 20 | 21 | 22 | 23 | |
| | 24 | 25 | 26 | 27 | 28 | Preparations | KU Festival | |
| 11 | KU Festival | Clean up | 2 | 3 | 4 | 5 | 6 | |
| | 7 | 8 | 9 | 10 | 11 | 12 | 13 | |
| | 14 | 15 | 16 | 17 | 18 | 19 | 20 | |
| | 21 | 22 | 23 | 24 | 25 | 26 | 27 | |
| 12 | 28 | 29 | 30 | 1 | 2 | 3 | 4 | |
| | 5 | 6 | 7 | 8 | 9 | 10 | 11 | Q4 |
| | 12 | 13 | 14 | 15 | 16 | 17 | 18 | |
| | 19 | 20 | 21 | 22 | 23 | 24 | 25 | |
| 1 | 26 | 27 | 28 | 29 | 30 | 31 | 1 | |
| | 2 | 3 | 4 | 5 | Mon. | 7 | 8 | |
| | 9 | 10 | 11 | Fri. | 13 | Preparations | Common test | |
| | Common test | 17 | 18 | 19 | 20 | 21 | 22 | |
| | 23 | 24 | 25 | 26 | 27 | 28 | 29 | |
| 2 | 30 | 31 | 1 | 2 | 3 | 4 | 5 | |
| | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| | 13 | TOEIC-IP | | 16 | 17 | 18 | 19 | |
| | 20 | 21 | 22 | 23 | 24 | ⑦ | | |
| 3 | 27 | 28 | 1 | 2 | 3 | 4 | 5 | |
| | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| | 13 | 14 | 15 | 16 | 17 | 18 | 19 | |
| | 20 | 21 | ⑧ | 23 | 24 | 25 | 26 | |
| | 27 | 28 | 29 | 30 | 31 | | | |
| Class* | | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | times | |
| Exam* | | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | times | |

Classes　Exams　Holidays　Seasonal Vacations　No Classes Day **

①Registration Guidance
②Orientation for College Students
③Entrance Ceremony (For Degree students)
＃1st Quarter classes start　Apr.5
Spring Campus Visit　May 30
University Founding Day　May 31
Q1 Make-up Classes Week / 6th period on May 14-27
④Health Check for New Coming College Students
＃2nd Quarter classes start　June 10
Q2 Make-up Classes Week / 6th period on July 15-30
Summer Campus Visit　Aug.3 -16
Autum Campus Visit　Sep.18-19
⑤Commencement Ceremony

⑥Entrance Ceremony (For Degree students)
＃3rd Quarter classes start　Oct.1
Kanazawa University Festival　Oct.30-31
Preparations and clean-up for KU Festival Oct.29/Nov.1

Q3 Make-up Classes Week / 6th period on Nov.9,11-24
＃4th Quarter classes start　Dec.8
Conduct Classes for Monday　Jan.6
Conduct Classes for Friday　Jan.12
Preparations date for Common Test　Jan.14
Common test for University Admissions　Jan.15-16
Q4 Make-up Classes Week / 6th period on Jan.21-Feb.3
TOEIC-IP(First Year College Student)　Feb.14-15
⑦KU Admission Examination
⑧Commencement Ceremony

* Class and Exam totals are per quarter.

** There may be supplementary or intensive lectures

## III. Study outline

### 1 Campus

This collaborative educational program is offered in the Division of Advanced Science and Technology at Japan Advanced Institute of Science and Technology in Nomi City, Ishikawa Prefecture and the Graduate School of Frontier Science Initiative at Kanazawa University in Kanazawa City, Ishikawa Prefecture.

### 2 Programs

The Graduate School of Advanced Science and Technology at JAIST consists of the Division of Advanced Science and Technology and the Division of Transdisciplinary Sciences. The Division of Transdisciplinary Sciences offers a graduate program which is 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. This guide describes on the Division of Transdisciplinary Sciences at JAIST. The guide for the Division of Advanced Science and Technology at JAIST and the Division of Transdisciplinary Sciences at Kanazawa University are specified separately.

### 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 (Division of Transdisciplinary Sciences, Graduate School of Advanced Science and Technology (hyperlink button) → For Students → Academic calendar (JAIST)).
Students must also check the academic calendar for the Graduate School of Frontier Science Initiative at Kanazawa University which is published on JAIST's website (Division of Transdisciplinary Sciences, Graduate School of Advanced Science and Technology (hyperlink button) → For Student → Academic calendar (Kanazawa University)).

### 4 Semesters and class terms/periods

Semesters and class terms/periods at JAIST and Kanazawa University are shown in the Appendix Table below. At JAIST, each class is 100-minute long, and a class meets 14 times in one term with two classes a week to complete a course bearing 2 credits. At Kanazawa University, each class is 90-minute long, and a class meets 15 times in one quarter with one class a week to complete a course bearing 2 credits. Refer to the syllabus for details of each course. One credit is awarded for a study load of 45 hours of self-study and classes in total (for courses such as Research Support Courses, one credit is awarded for an adequate result required for a study load defined by one's supervisor).

Appendix Table

| Location | Terms | Class Periods |
|---|---|---|
| JAIST | First Semester:<br>Term 1-1, Term 1-2 (8 weeks each)<br>Summer Intensive (August, September)<br>Second Semester:<br>Term 2-1, Term 2-2 (8 weeks each)<br>Winter Intensive (February, March)<br>*The Examination Term is set after the lectures in each term. The examinations of Intensive Courses are basically conducted after finishing 14 lectures. | 1st Period 9:00 - 10:40<br>2nd Period 10:50 - 12:30<br>3rd Period 13:30 - 15:10 (Tutorial hours)<br>4th Period 15:20 - 17:00<br>5th Period 17:10 - 18:50 |
| Kanazawa University | First Semester: 15 classes (one class a week) and one examination per quarter<br>1st Quarter (8 weeks)<br>2nd Quarter (8 weeks)<br>Second Semester: 15 classes (one class a week) and one examination per quarter<br>3rd Quarter (8 weeks)<br>4th Quarter (8 weeks)<br>*The examinations are conducted in the last week of each quarter. | 1st Period 8:45 - 10:15<br>2nd Period 10:30 - 12:00<br>3rd Period 13:15 - 14:45<br>4th Period 15:00 - 16:30<br>5th Period 16:45 - 18:15<br>6th Period 18:30 - 20:00 |

## IV. Matters related to tuition fees and enrollment

All the procedures from 1 to 6 below must be completed at JAIST.

### 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*). 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 your study for more than two 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 start date of a leave of absence should be the first of each month, and it will not be permitted midway through a month. If you wish to apply for a leave of absence, you must collect an Application for Leave of Absence from the Educational Service Section (hereafter, Kyoumu) and get approval from the supervisors, and submit the application to Kyoumu no later than one month before the desired start of the leave of absence. If leave of absence is due to bad health, you must submit a doctor's statement also.

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

If you wish to have a leave of absence midway through either semester, and you 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 (Division of Transdisciplinary Sciences, Graduate School of Advanced Science and Technology (hyperlink button) → For Student → Absence and Withdrawal (JAIST)).

### 3 Returning

You return when the leave of absence ends. If you wish to return to school before the end of the leave of absence, you must collect an Application for Returning at Kyoumu and submit it to Kyoumu at least one month before your proposed month of returning. Returning status starts on the first day of the month.

### 4 Withdrawal

A date for withdrawal should be the last day of the month, and withdrawal midway through the month is not permitted. Students who wish to withdraw must collect an Application for Withdrawal from Kyoumu and obtain comments from the supervisors, and submit the application to 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 one of the following categories will result in the loss of student status:

(1) Those who have spent more than the permitted maximum periods (four years for the master's program, six years for the doctoral program)
*Students who wish 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 (two years).

(3) Those who have not paid the entrance 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 at urging.

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

### 6 Supplemental student status

Doctoral students who have spent more than three years in the doctoral program may be allowed to keep student status for a maximum period of two years only if they have met all the following requirements:

(1) Have obtained all the required credits for degree completion, except for credits from "Doctor Thesis Report Ⅱ".
(2) Have submitted the outline of doctoral dissertation with the necessary research guidance from the supervisor by the designated date.
(3) Have been judged by the dean that the students will be able to apply for a degree conferment within two years.

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. Those who wish to apply for this status must request a form at Kyoumu, consult the supervisor to be given a comment on the form, and submit it to Kyoumu at least one month before the proposed starting day of the status. This status restricts you to conduct any academic work on campus, thus JAIST does not sponsor you to apply/extend/renew your student visa for the period.

### 7 Name changes

If you have changed your name, you must submit a Notification of Change of Name with evidential documents attesting to the change (e.g. a new resident's registration) to Kyoumu. After acceptance of the notification, all certificates and documents of JAIST will be issued with your new name. If you wish to continue using the old name at JAIST, notify it to Kyoumu when submitting the notification, and your name will remain unchanged even after the acceptance of your notification. Certificates will be issued only with the name registered in JAIST records.

## V. Matters related to taking courses

### 1 Degree completion requirements

In this collaborative program, which aims to cultivate human resources of innovative science and technology, the following courses are systematically organized in the curriculum based on the elements that students are expected to learn in these courses in light of the educational mission, goals and curriculum policies.

It is insufficient for you merely to take lectures with a passive attitude. To acquire abilities that will benefit you in the future, JAIST expects you to actively develop the seeds of social, organizational, or technological innovation for the next era while learning advanced science and technology and understanding social and organizational problems through your learning process.

### 2 Course divisions and credit requirements for the master's program

#### 2.1 Core Courses

The courses below (1 credit each) are offered from Term 1-1 to Term 2-1 in the first year and students must take at least 2 courses (2 credits) of the 5 courses (5 credits) below as required elective courses. In these courses, students will build fundamental knowledge base for conducting research to solve complex social problems related to innovative science and technology.

Innovation Theory and Methodology for Social Competencies (JAIST)
Innovation Theory and Methodology for Creativity (JAIST)
Introduction to Entrepreneurship (Kanazawa University)
Entrepreneurial Core Technology and Strategy (Kanazawa University)
Research Ethics (Kanazawa University)

"Statistics for Data Analytics" (JAIST/2 credits), "'Introduction to Practical Data Analysis and Statistics a" and "Introduction to Practical Data Analysis and Statistics b" (Kanazawa University/1 credit each) are also offered from Term 1-1 to Term 1-2 in the first year and students must earn at least 2 credits as required elective courses from these courses. These courses are designed to promote mainly `Force 1: The"Force" for Data analysis' and `Force 3: The"Force" for Visualization' of `Four "Forces" (Force)' which serve as the foundation of the methodology for integrating sciences.

[Credit Requirements] *Students must satisfy both of the requirements below.
(1) Earn at least 2 credits from the courses below. (1 credit each)
Innovation Theory and Methodology for Social Competencies (JAIST)
Innovation Theory and Methodology for Creativity (JAIST)
Introduction to Entrepreneurship (Kanazawa University)
Entrepreneurial Core Technology and Strategy (Kanazawa University)
Research Ethics (Kanazawa University)
(2) Earn at least 2 credits from the courses below.
Statistics for Data Analytics (JAIST) (2 credits)
Introduction to Practical Data Analysis and Statistics a (Kanazawa University) (1 credit)
Introduction to Practical Data Analysis and Statistics b (Kanazawa University) (1 credit)

#### 2.2 Transdisciplinary Experience Courses

"Transdisciplinary Session I" (2 credits) is offered in September in the first year and "Transdisciplinary Laboratory rotation Ia" and "Transdisciplinary Laboratory rotation Ib" (1 credit each) are offered from Term 2-1 to Term 2-2 in the first year at both universities as required courses.

"Transdisciplinary Session I" takes the form of a joint session between JAIST and Kanazawa University and consists of general discussions, presentations of research proposals by students and Q&A sessions. Its aim is to adopt the knowledge and methodologies of different fields beyond the existing academic or research fields by presenting one's research to other students and better understanding each other, and also to deepen the understanding of one's research further by taking an opportunity to review the topic, direction or purpose of one's research. This course is designed to promote `Force 2 : The"Force" for Modeling' of `Four "Forces" (Force)' which serve as the

foundation of the methodology for integrating sciences.

In "Transdisciplinary Laboratory rotation Ia" and "Transdisciplinary Laboratory rotation Ib", students participate in more than 2 weeks (per a credit) laboratory rotations in different laboratories from your major field and take experimental and theoretical research practice. In these laboratory rotations, students can learn practical knowledge of research methods and ideas of a different field while acquiring comprehensive knowledge and skills beyond your own major field. New knowledge and perspectives gained in these rotations will facilitate students to generate new ideas and develop a basic mindset which gives you an objective perspective on your own research topic resulting in exploring the potential of research integration.

For "Transdisciplinary Laboratory rotation Ia" and "Transdisciplinary Laboratory Rotation Ib", the following 4 courses are offered at JAIST and Kanazawa University (depending on the laboratory the student belongs to).
Transdisciplinary Laboratory rotation Ia (JAIST)
Transdisciplinary Laboratory rotation Ib (JAIST)
Transdisciplinary Laboratory rotation Ia (KU)
Transdisciplinary Laboratory rotation Ib (KU)
Either "Transdisciplinary Laboratory rotation Ia (KU)" or "Transdisciplinary Laboratory rotation Ib (KU)" must be completed as part of the credit requirements. For selection of rotations, students must decide which laboratories to identify considering discussion with own supervisor and lessons learned from "Transdisciplinary Session I". This course is designed to foster mainly `Force 4：The"Force" for Designing' of `Four "Forces" (Force)' which serve as the foundation of the methodology for integrating sciences.

[Credit Requirements] *Students must satisfy both of the requirements below.
(1) Take Transdisciplinary Session I (2 credits).
(2) Earn 1 credit from the courses below (1 credit each).
Transdisciplinary Laboratory rotation Ia (KU)
Transdisciplinary Laboratory rotation Ib (KU)

### 2.3 Social Impremention Courses

These courses are required elective and consist of 1 or 2 credit offered "Industrial Internship" and "Research Internship". In these courses, students go through a field-based learning. You learn, based on Four "Forces" (Force) you have developed so far, how research with high potential becomes a successful business in actual workplaces and how it leads to innovation. Students must determine your host company (domestic or foreign private companies, public research institutions, etc.) under the guidance of your supervisor and complete the necessary procedures at Kyoumu and the Career Support Section at least two weeks before the starting date of "Industrial Internship". For "Research Internship", students must complete the necessary procedures at Kyoumu at least two months before the starting month of the internship. The standard duration of "Industrial Internship" and "Research Internship" is 1 – 2 weeks. Students are required to write a report after the internship and also report achievements in optional forms to your supervisor.

[Credit Requirements] *Students must complete one of the followings.
Industrial Internship a (JAIST) (1 credit) *Duration of min. one week and less than two weeks
Industrial Internship b (JAIST) (2 credits) *Duration of min. 2 weeks
Research Internship a (JAIST) (1 credit) *Duration of min. one week and less than two weeks
Research Internship b (JAIST) (2 credits) *Duration of min. 2 weeks

### 2.4 Specialized Courses

Students must earn at least 10 credits (at least 12 credits for those who choose "Survey for Doctoral

Research Plan") as required elective courses from "Specialized Courses" which are aimed to develop specialist knowledge according to one's own research topic based on the basic knowledge and skills acquired in the first and second year.
"Specialized Courses" is classified into 4 categories which are Common Subjects, Life Science Subjects, Materials Science Subjects and Social Systems Science Subjects. Based on this classification, students must choose courses from at least 2 categories according to the framework of the three innovative challenges (3 challenges) under the guidance of your supervisor with the following as a reference. This will enable students to integrate multiple scientific disciplines in addition to improving your specialist knowledge.

I: Students who choose Life Innovation: Life Science Subjects
II: Students who choose Green Innovation: Materials Science Subjects
III: Students who choose Systems Innovation: Social Systems Science Subjects or Materials Science Subjects

[Credit Requirements] *Students must satisfy both of the requirements below.
(1) Students who choose "Master's Thesis Project" or "Research Project" as a form of your research report must earn at least 10 credits from "Specialized Courses". Students who choose "Survey for Doctoral Research Plan" must earn at least 12 credits from "Specialized Courses".
(2) Students must choose courses from at least 2 categories out of Common Subjects, Life Science Subjects, Materials Science Subjects and Social Systems Science Subjects according to the one of the three innovative challenges (3 challenges) that students chose after discussing with your supervisor.

### 2.5 Research Support Courses

From the last half of the first year to the second year, "Seminar and Exercise I" (2 credits) where students receive instructions and supervision from your second supervisor and present your research outcomes at the mid-term presentation mentioned below is offered.
Also, as supportive courses for research summary, "Master Thesis Report I" (6 credits), "Research Project" (2 credits) and "Survey for Doctoral Research Plan" (2 credits) are designed. They are required elective, students must select one of the 3 options and receive instructions and supervision from your supervisor.
The final form of your research summary, in accordance with own idea of research topic, students should discuss with your supervisor and choose from (1) - (3) below. Then, students are required to submit "Research Proposal" which summarizes your ongoing research plan to Kyoumu by the end of March in the first year and determine the form of your research summary. In Research Support Courses, students will consolidate and sublimate the Four "Forces" (Force) cultuvated so far and work on your research topic using sufficiently developed specialist knowledge.

(1) Master's Thesis Project
Students who set a research theme which constructs, verifies and develops a hypothesis or a model or a research theme which develops innovative technology to contribute to solving social problems based on the 3 challenges should choose this option and summarize your research in the form of a thesis.
Elective course: Master Thesis Report I (6 credits)

(2) Research Project
Students who set a research theme which derives the correlation or causal connections of phenomena, proposes a roadmap for science and technology and new concepts and designs the future based on comprehensive facts and data including previous research to contribute to solving social problems based on the 3 challenges should choose this option.
Elective course: Research Project (2 credits)

(3) Survey for Doctoral Research Plan
This option is recommended for students who wish to progress to the doctoral program. It is essential that the research plan leads to the research theme in the doctoral program and the

achievements must be summarized in a Survey Report for Doctoral Research Plan.
Elective course: Research Planning for Ph.D Course (2 credits)

[Credit Requirements] *Students must satisfy the respective requirements according to the chosen form of your research report.

(1) Master's Thesis Project
Must take "Master Thesis Report I (JAIST)" (6 credits) and "Seminar and Exercise I (KU)" (2 credits).

(2) Research Project
Must take "Research Project (JAIST)" (2 credits) and "Seminar and Exercise I (KU)" (2 credits).
Must earn at least 4 credits from "Transdisciplinary Experience Courses (excluding "Transdisciplinary Session I"), Social Impremention Courses or Specialized Courses in addition to the credit requirements and the total number of required credits in Section 2.1 to 2.4.after discussing with the supervisor.

(3) Survey for Doctoral Research Plan
Must take "Research Planning for Ph.D Course (JAIST)" (2 credits) and "Seminar and Exercise I (KU)" (2 credits).
Must earn at least 4 credits from "Transdisciplinary Experience Courses (excluding "Transdisciplinary Session I"), Social Impremention Courses or Specialized Courses in addition to the credit requirements and the total number of required credits in Section 2.1 to 2.4 after discussing with the supervisor.

## 3 Degree completion requirements for the master's program

Degree completion requirements are shown below. All the academic activities should be planned with the advice of the assigned supervisor and other advisors. Students are responsible for reviewing own gaining credits carefully to satisfy the requirements of degree completion.

(1) In principle, students are required to spend a minimum of two years in the master's program. If a prior application for fast-track degree completion is made and granted, and the plan for fast-track degree completion (one year minimum) is carried out with the academic grades deemed sufficiently high by faculty, according to Article 36 of the JAIST School Regulations, one will be able to finish in less than two years. Those who wish to apply for fast-track degree completion should contact Kyoumu by the date designated by JAIST.

(2) Students must submit a master's thesis or a research project report after receiving sufficient research guidance, and pass the defense on the thesis and the final examination. Those who choose a Survey for Doctoral Research Plan must submit a report of Survey for Doctoral Research Plan, and pass the Ph.D. Qualifying Examination.

(3) Students must earn a total of at least 10 credits from each of the courses offered at JAIST and Kanazawa University respectively(excluding the credits recognized in Section 9 mentioned below). Because there is a requirement in Section 2.2 and 2.5 for the number of credits that needs to be earned at Kanazawa University as specified below, students are required to earn at least 6 credits from courses offered at Kanazawa University.
- Transdisciplinary Experience Courses
Transdisciplinary Session I (1 credit: 1 of the 2 credits is counted as a credit earned at Kanazawa University.)
Transdisciplinary Laboratory rotation Ia (KU) or Transdisciplinary Laboratory rotation Ib (KU) (1 credit)
- Research Support Courses
Seminar and Exercise I (2 credits)

(4) Students must earn a total of at least 32 credits including the credits recognized by satisfying the credit requirements specified in Section 2.1 to 2.5 above. Those who choose "Survey for Doctoral Research Plan" as the form of your research summary must earn a total of at least 34

credits.
With regards to the courses offered by divisions other than this collaborative program at JAIST and Kanazawa University, a maximum of 6 credits can be counted toward the degree completion requirements as "Optional Courses" including the credits recognized in Section 9 and 10 mentioned below. (For courses offered at JAIST, only K/I/M/Nxxx courses in the Division of Advanced Science and Technology are applicable.)

## 4 Course divisions and credit requirements for the doctoral program

### 4.1 Transdisciplinary Experience Courses

"Transdisciplinary Session II" (2 credits) and "Transdisciplinary Laboratory rotation II" (1 credit) are offered as required courses from the first year. They are offered as the upgraded version of "Transdisciplinary Session I" and "Transdisciplinary Laboratory rotation I" respectively. Students at JAIST are required to take "Transdisciplinary Laboratory rotation II" offered at Kanazawa University.

"Transdisciplinary Session II" is offered as a required course in the first half of the first year in the form of collaboration between JAIST and Kanazawa University. In this course, students are required to present your research to other students and participate in discussions as well as participating in group work where they work on a theme of transdisciplinary sciences with the application of sciences to society in mind (e.g. developing a new product, starting a new business or finding solutions to social problems, etc.) in order to adopt the knowledge and methodologies of different fields beyond the existing academic fields. This course aims to further develop mainly "Force 2：The"Force" for Modeling" of "Four "Forces" (Force)".

In "'Transdisciplinary Laboratory rotation II", students, from the first year to the second year, participate in more than 2 weeks a laboratory rotation in different laboratories from your major field and take experimental and theoretical research practice in order to acquire practical knowledge of research methods and ideas of a different field. The host laboratory will be that of Kanazawa University. This laboratory rotation will allow students to explore the potential of transdisciplinary research while acquiring comprehensive knowledge and skills beyond your own major field by conducting experimental and theoretical research. This course aims to enhance mainly `Force 4：The"Force" for Designing' of`Four "Forces" (Force)'.

[Credit Requirements] *Students must satisfy both of the requirements below.
(1) Take "Transdisciplinary Session II". (2 credits)
(2) Take "Transdisciplinary Laboratory rotation II (KU)". (1 credit)

### 4.2 Social Impremention Courses

"Overseas Research Challenge" (1, 2 or 4 credits) where students participate in an overseas research program at a foreign university or foreign research institution and "International Internship" (1 credit) where students participate in an internship at a foreign or global company are offered as required elective courses. In "Overseas Research Challenge", 1, 2 or 4 credits are granted according to the duration of the program. These courses will give students an opportunity to learn new ways of approaching your research from different fields at a higher level and deepen the understanding of your own research theme even further.
Students must decide your host university, research institution or company under the guidance of your supervisor and complete the necessary procedures at Kyoumu and the Career Support Section at least one month before the starting month of the program/internship. Students are required to write a report after the program/internship and also report achievements in optional forms to your supervisor and second supervisors.

[Credit Requirements] *Students must complete one of the followings.
Overseas Research Challenge A (JAIST) (1 credit) *Duration of min. one week and less than two weeks
Overseas Research Challenge B (JAIST) (2 credits) *Duration of min. two weeks and less than two months
Overseas Research Challenge C (JAIST) (4 credits) *Duration of min. 2 months
International Internship (JAIST) (1 credit) *Duration of min. 2 weeks

### 4.3 Specialized Courses

"Innovation Theory and Methodology for Total Capability Development" (JAIST) and "Fostering the independence of researchers" (KU) (1 credit each) are offered in the first year as required elective courses. In these courses, students cultivate an ability to build good relationship with real world and an ability to actualize the future needs using practical methods.

Students must earn at least 9 credits including one of the credits mentioned above as required elective courses from "Specialized Courses", which are aimed to cultivate specialist knowledge according to your own research topic based on the basic knowledge and skills acquired in the first year to the third year.

"Specialized Courses" is classified into 4 categories which are Common Subjects, Life Science Subjects, Materials Science Subjects and Social Systems Science Subjects. Based on this classification, students must choose courses from at least 2 categories according to the framework of the three innovative challenges (3 challenges) under the guidance of your supervisor with the following as a reference. This will enable students to acquire comprehensive and deepened specialist knowledge from the perspective of transdisciplinary sciences in addition to developing specialist knowledge.

I: Students who choose Life Innovation: Life Science Subjects
II: Students who choose Green Innovation: Materials Science Subjects
III: Students who choose Systems Innovation: Social Systems Science Subjects or Materials Science Subjects

"Statistics for Data Analytics II" (JAIST) and "Introduction to Practical Data Analysis and Statistics" (KU) (2 credits each) are offered for those who have never studied subjects such as statistics in order to equip them with the required level of knowledge to conduct research of transdisciplinary sciences in the doctoral program and enhance `Force 1 : The"Force" for Data analysis' and `Force 3 : The"Force" for Visualization' of the `Four "Forces" (Force)'. Although students are strongly advised to discuss taking these courses with your supervisor, the earned credits are not counted toward the completion requirements.

[Credit Requirements] *Students must satisfy all the requirements below.
(1) Earn at least 1 credit from the courses below. (1 credit each)
Innovation Theory and Methodology for Total Capability Development (JAIST)
Fostering the independence of researchers (KU)
(2) Earn at least 9 credits from "Specialized Courses" including 1 credit earned in (1).
(3) Take courses from at least 2 categories from Common Subjects, Life Science Subjects, Materials Science Subjects and Social Systems Science Subjects according to the one of the three innovative challenges (3 challenges) that students chose after discussing with their supervisor. The credit(s) earned in (1) above can be counted toward the credit requirements for Common Subjects.

### 4.4 Research Support Courses

"Seminar and Exercise Ⅱ" (4 credits) and "Doctor Thesis Report Ⅱ" (6 credits) are offered as required courses. In "Seminar and Exercise II", students will receive supervision and advice from the second supervisor chosen from faculty of Kanazawa University. In addition, students will acquire new ways of approaching your research through joint research, discussions and group study with other students of different major fields from your own and deepen the understanding of your own research theme under the guidance of the second supervisor.

Also, "Doctor Thesis Report Ⅱ" is designed as a supportive course for research summary. Students are required to submit "Research Proposal" about your doctoral research to Kyoumu by March in the first year and receive research guidance from your supervisor in all aspects of their research including how to make the best use of the "Four "Forces" (Force)" that students have been developing so far or new knowledge and skills acquired in a laboratory rotation and from research guidance received in other research fields in order to write your doctoral dissertation.

[Credit Requirements]
Must take "Seminar and Exercise II (KU)" (4 credits) and "Doctor Thesis Report Ⅱ (JAIST)" (6 credits).

**5 Degree completion requirements for the doctoral program**

Students must satisfy all the requirements listed below for degree completion. It is the responsibility of each student to discuss with your supervisor and check whether or not they satisfy these requirements.

(1) In principle, to be eligible for a doctoral degree from JAIST, students are required to spend a minimum of five years in a graduate institute (including the time spent in the master's program). If an application for fast-track degree completion is made by the specified time, and it is recognized at a faculty meeting that there are excellent research achievements, one will be able to complete a doctoral program in a shorter time after spending a minimum of three years (including the time spent in the master's program) according to Article 37 of the JAIST School Regulations. See Section 2.2 of VII for details on fast-track degree completion.
(2) Students must submit a doctoral dissertation after receiving sufficient research instructions, and pass the defense on the dissertation and the final examinations.
(3) Students must earn a total of at least 10 credits (excluding the credits recognized in Section 9 mentioned below) from courses offered at JAIST and Kanazawa University except for those who progressed to the doctoral program from the master's program of this collaborative program by the Internal Entrance Examination.
(4) Students must earn a total of at least 23 credits including the credits recognized by satisfying the credit requirements specified in Section 4.1 to 4.4 mentioned above.
With regards to the courses offered by divisions other than this collaborative program at JAIST and Kanazawa University (for courses offered at JAIST, only K/I/Mxxx courses except K/I/M1xx courses in the Division of Advanced Science and Technology are applicable.), a maximum of 2 credits can be counted toward the degree completion requirements as "Specialized Courses" (Common Subjects) including the credits recognized in Section 10 mentioned below.

(Reference)【Master's Program】Summary of Credits Requirements

| Course Division | Course Title/*Notes* | Offered by | Offered Credits | Type of Requirement | Credits To Be Earned | | | Of which, To Be Earned from KU. |
|---|---|---|---|---|---|---|---|---|
| | | | | | Master Thesis Report | Research Project | Research Planning for Ph.D Course | |
| Core Courses | Innovation Theory and Methodology for Social Competencies | JAIST | 1 | Required Elective | 2 | 2 | 2 | ※ |
| | Innovation Theory and Methodology for Creativity | JAIST | 1 | | | | | |
| | Introduction to Entrepreneurship | KU | 1 | | | | | |
| | Entrepreneurial Core Technology and Strategy | KU | 1 | | | | | |
| | Research Ethics | KU | 1 | | | | | |
| | Statistics for Data Analytics | JAIST | 2 | Required Elective | 2 | 2 | 2 | ※ |
| | Introduction to Practical Data Analysis and Statistics a<br>Introduction to Practical Data Analysis and Statistics b | KU | each 1 | | | | | |
| Transdisciplinary Experience Courses | Transdisciplinary Session I | JAIST–KU Joint | 2 (J1・KU1) | Required | 2 | 2 | 2 | 1 |
| | Transdisciplinary Laboratory Rotation Ia (KU)<br>Transdisciplinary Laboratory Rotation Ib (KU) | JAIST | each 1 | Required Elective<br>*1 credit from Ⅰa(KU) or Ⅰb(KU) must be included | 1 | 1 | 1 | 1 |
| | Transdisciplinary Laboratory Rotation Ia (JAIST)<br>Transdisciplinary Laboratory Rotation Ib (JAIST) | KU | each 1 | | | | | |
| Social Imprementation Courses | Industrial Internship a (JAIST) | JAIST | 1 | Required Elective | 1 | 1 | 1 | |
| | Industrial Internship b (JAIST) | JAIST | 2 | | | | | |
| | Research Internship a (JAIST) | JAIST | 1 | | | | | |
| | Research Internship b (JAIST) | JAIST | 2 | | | | | |
| Specialized Courses | *Students must take courses from 2 or more of 4 subject categories, Common, Life Science, Materials Science and Systems Innovation.* | JAIST<br>KU | 1or2 | Required Elective | 10 | 10 | 12 | ※ |
| Research Support Courses | Seminar and Exercise I (KU) | KU | 2 | Required | 2 | 2 | 2 | 2 |
| | Master Thesis Report I (JAIST) | JAIST | 6 | Required Elective | 6 | 2 | 2 | |
| | Research Project (JAIST) | JAIST | 2 | | | | | |
| | Research Planning for Ph.D Course (JAIST) | JAIST | 2 | | | | | |
| | *Those who choose "Research Project" or "Research Planning for Ph.D Course" must earn at least 4 credits from "Transdisciplinary Experience Courses" (excluding "Transdisciplinary Session I"), "Social Imprementation Courses" or "Specialized Courses" in addition to a total of required credits above.* | JAIST<br>KU | 1or2 | Required Elective | | 4 | 4 | ※ |
| Optional Courses | *Students earn freely at least 6 credits from all the categories except for "Transdisciplinary Session I" and Research Support Courses in addition to a total of required credits above.*<br>*The credits earned at other than this collaborative program can be counted up to 6 including those recognized by credits transfer or those offered by other graduate institute through the course interchange agreement. Credits earned in Division of Advanced Science and Technology in JAIST are limited to those of K, I, M, and Nxxx courses.* | JAIST<br>KU | 1or2 | Required Elective | 6 | 6 | 6 | ※ |
| | | | | **Total** | **32** | **32** | **34** | **10** |

※ implies that students must earn credits by KU offering courses so that the total of ※ is at least 6 credits.

## (Reference)【Doctoral Program】Summary of Credits Requirements

| Course Division | Course Title/*Notes* | Offered by | Offered Credits | Type of Requirement | Credits To Be Earned | Of which, To Be Earned from KU. |
|---|---|---|---|---|---|---|
| Transdisciplinary Experience Courses | Transdisciplinary Session Ⅱ | JAIST-KU Joint | 2 (J1・KU1) | Required | 2 | 1 |
| | Transdisciplinary Laboratory Rotation Ⅱ (KU) | KU | 1 | Required | 1 | 1 |
| Social Impremention Courses | Overseas Research Challenge A (JAIST) | JAIST | 1 | Required Elective | 1 | |
| | Overseas Research Challenge B (JAIST) | JAIST | 2 | | | |
| | Overseas Research Challenge C (JAIST) | JAIST | 4 | | | |
| | International Internship (JAIST) | JAIST | 1 | | | |
| Specialized Courses | Innovation Theory and Methodology for Total Capability Development | JAIST | 1 | Required Elective | 1 | 4 (※) |
| | Fostering the independence of researchers | KU | 1 | | | |
| | *Students must take courses from 2 or more of 4 subject categories, Common, Life Science, Materials Science and Systems Innovation.*<br><br>*It is sufficient for you to take either "Innovation Theory and Methodology for Total Capability Development"(JAIST) or "Fostering the independence of researchers"(KU) to fulfill the category requirement of Common Subjects.*<br><br>*The credits earned at other than this collaborative program can be counted up to 2 as the one of Common Subjects. Those earned in Division of Advanced Science and Technology in JAIST are limited to those of K, I and Mxxx courses excluding those of K, I, M1xx series.* | JAIST<br><br>KU | each 2 | Required Elective | 8 | |
| Research Support Courses | Seminar and Exercise Ⅱ (KU) | KU | 4 | Required | 4 | 4 |
| | Doctor Thesis Report Ⅱ (JAIST) | JAIST | 6 | Required | 6 | |
| | | | | **Total** | **23** | **10** |

※ implies that, with the exception of those who proceeded from Master's course of this collaborative program, students must earn at least 4 credits from Specialized Courses offered by KU.

## 6 Course-related procedures

### 6.1 Gakumu System (Academic Affairs System)

JAIST uses the Gakumu System for all procedures related to course registration, grade checking, and so on for courses offered at JAIST. Make sure that you fully understand how to use the system so as not to have any problems with registration or other actions. If there are any unclear points after reading the manual, contact Kyoumu.

[Logging in to the Gakumu System]
<JAIST top page → Education → Taking Courses → Gakumu System (Academic Affairs System)>
*Note that the user ID for login is the same as the ID assigned at matriculation, and the password is the same one used for JAIST Mail.

### 6.2 Syllabi

Syllabi can be viewed on the Gakumu System and on the JAIST website (Division of Transdisciplinary Sciences, Graduate School of Advanced Science and Technology (hyperlink button) → For Student→ Syllabi). Copies of the syllabus booklet are not available.

### 6.3 Course registration

Plan your course registration properly by checking the class schedule and the course syllabi carefully. Neither registration of two courses which have overlapping schedules (even if only partially), nor registration of courses from which you have obtained credits will be allowed. Note that the credits for courses taken after enrollment with the same code but offered in different languages (e.g. K211 and K211E) are regarded as the same course.

The registration process for courses offered at JAIST is explained in this guide as below. The process for courses offered at Kanazawa University will be separately explained in another way.
Students in this collaborative program must take courses held at the Ishikawa Campus. You must also register online for non-credit courses in order to attend them.
Make course registration through the Gakumu System. Check the system manual for how to register for courses online (JAIST top page → Education → Taking Courses → Gakumu System (Academic Affairs System) → student manual → Course Registration/Grades).
All the academic activities should be planned with the advice of your supervisor. Register online for courses through the Gakumu System during the designated period for each term after a consultation with your supervisor. You can add, change, and cancel courses freely during the designated registration period, however once the registration period ends, no course can be added/removed without exception. You are responsible for reviewing your registration carefully, correcting any mistakes and making sure the course registration properly done. Confirm the course registration period for each term on the academic calendar.
Notification of intensive courses and other irregular courses will be made to students once the schedules have been set.

## 7 Examinations, grade assessments, etc.

(1) A final exam will generally be given to complete a course. When exams are difficult to be given, research reports or similar tasks will be required for grade assessment.
(2) Grades are assessed by the result of a final examination and student's achievement using a 100 point scale with 60 points or higher being considered "Passing", and 59 points or less being considered "Failing" based on the view point, method, and criteria listed in the syllabus. Courses which are difficult to score with points will be assessed as either "Pass" or "Fail". The specified credits will be awarded to those who receive a "Passing" evaluation.
(3) Credits that have already been obtained cannot be canceled.
(4) Grades for courses offered at JAIST can be confirmed on the Gakumu System around two weeks after the end of each term, and grades for courses offered at Kanazawa University can be confirmed once notification for grade reports is sent from Kyoumu. Contact Kyoumu for any questions regarding grade assessments.

(5) If there are any improprieties related to taking courses or examinations, all credits for that semester will be withdrawn.
(6) JAIST may calculate an objective academic performance index based on (1) and (2) so that it might be used for certain procedures that JAIST deems necessary.

## 8 Course evaluations

To help improve class quality, JAIST asks you to provide an evaluation for each course you have attended at the end of the course. The results are notified to the course instructors after grades are reported.

## 9 Recognition of credits obtained prior to admission

Credits obtained prior to admission can be recognized as credits obtained at JASIT by credits transfer. If you wish to apply for credits transfer, obtain approval from your supervisor and submit an application form "Request for Transfer Credit Evaluation" to Kyoumu within three weeks of enrollment. Download the application form from the JAIST website (JAIST top page → Education → Academic Procedures → Request for Transfer Credit). To transfer credits obtained at other graduate institutes, the official transcript and syllabi for the courses must be submitted as well.
The result of application for credit transfer will turn up on the Gakumu system around two months after matriculation, you are responsible to confirm it. You are not allowed to change or withdraw once it has been approved. The grade of the transferred course is recorded as "T" (Transferred), however by taking the same course at JAIST after enrollment, the numerical grade will be overwritten.
Check the following details.
(1) Credits obtained at other graduate institutes
(Master's Program)
With regards to the credits obtained in the master's program at other graduate institutes prior to enrolment to JAIST, a maximum of 6 credits (including courses offered in the Division of Advanced Science and Technology) can be transferred as K/I/Mxxx courses with approval at a faculty meeting. These credits can be counted toward the degree completion requirement as "Specialized Courses" (courses offered in the master's program in the Division of Transdisciplinary Sciences only) or "Optional Courses".
(Doctoral Program)
With regards to the credits obtained in the doctoral program at other graduate institutes prior to enrolment to JAIST, a maximum of 2 credits (courses offered in the doctoral program in the Division of Transdisciplinary Sciences only) can be transferred as K/I/Mxxx courses with approval at a faculty meeting. (This does not apply to those who progressed from the master's program in the Division of Transdisciplinary Sciences by the Internal Entrance Examination.) These credits can be counted toward the degree completion requirement as "Specialized Courses".
(2) Credits obtained as a JAIST non-degree seeking student
All credits of the courses successfully obtained in the year you enter as a degree seeking student will be recognized in the master's program.
(3) Other
Please contact Kyoumu.

## 10 Taking courses at other graduate institutes through the course interchange agreement

To promote exchange and cooperation with the graduate institutes listed in the Appendix Table (hereafter referred to as "Partner Institutes") and to enhance our educational content, JAIST has implemented a course interchange agreement whereby each other's courses can be taken by students. After checking the syllabi of our Partner Institutes, students who wish to take courses there should discuss with your supervisor and follow the procedures. When applying, you must confirm the class schedule to choose courses that you can attend. For the first six months after enrollment, courses at JAIST have priority and you are not allowed to take courses at the partner institutes.

(1) Application fees, admission fees, and tuition fees

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

(2) Courses and credits

Courses that you can take at Partner Institutes (except the Open University of Japan) must be ones that can be beneficial for your research and that do not cover topics in the courses offered at JAIST. See the Appendix Table below. During your enrollment at JAIST, you can take a maximum of 5 courses (10 credits) including the credits obtained in courses offered by divisions other than the Division of Transdisciplinary Sciences (for courses offered at JAIST, only K/I/M/Nxxx courses in the Division of Advanced Science and Technology are applicable) and the credits recognized in Section 9. Note that the number of credits obtained at Partner Institutes that can be counted toward the degree completion requirements is as follows.

Master's Program: A maximum of 6 credits as "Optional Courses" including the credits obtained in courses offered by divisions other than the Division of Transdisciplinary Sciences at JAIST and Kanazawa University (for courses offered at JAIST, only K/I/M/Nxxx courses in the Division of Advanced Science and Technology are applicable) and the credits recognized in Section 9

Doctoral Program: A maximum of 2 credits as "Specialized Courses" (Common Subjects) including the credits obtained in courses offered by divisions other than the Division of Transdisciplinary Sciences at JAIST and Kanazawa University (for courses offered at JAIST, only K/I/Mxxx except K/I/M1xx courses in the Division of Advanced Science and Technology are applicable).

Permission for taking courses and the way JAIST will handle the obtained credits are determined at a faculty meeting after receiving your application.

(3) Application procedure

If you wish to take courses at a Partner Institute, consult with your supervisor and then carry out the procedure within the specified period. The class schedules, syllabi, and procedures for Partner Institutes will be notified once available.

Appendix Table

| Partner Institutes | Courses available |
|---|---|
| Graduate School of Natural Science and Technology, Kanazawa University | Courses taught by full-time faculty members of Partner Institutes (Laboratory work, practices, exercises, research projects, etc. are not included.)<br>Only for master's students |
| Graduate School of Engineering, Kanazawa Institute of Technology | |
| Graduate School of Arts and Sciences, the Open University of Japan | All the graduate school courses<br>Only for master's students |

## VI. Matters related to study and research supervision

### 1 Study and research supervision

In the master's program, the research supervision system consists of two faculty members; one supervisor (from JAIST) and one second supervisor (from Kanazawa University). Firstly, all students will be temporarily assigned to a laboratory of a faculty member who will be your advisor of JAIST in April in the first year (temporary assignment). Then, you will be formally assigned to a lab to determine the supervisor by late June in the first year (formal lab assignment). The second supervisor will be assigned by September in the first year.

In the doctoral program, the research supervision system consists of three faculty members; one supervisor (from JAIST) and two second supervisors (one of them is from Kanazawa University). All students will be formally assigned to a lab and the supervisor will be assigned upon matriculation after consultation with a proposed supervisor prior to enrollment. The second supervisor will be assigned in May in the first year.

This supervision system enables faculty members from both universities to provide students with collaborative research supervision which caters to individual needs of the students.

#### 1.1 Supervisor

The supervisor plays a main role in supervising students' education and research and provides guidance on taking courses, conducting research or writing a thesis/dissertation based on the research theme of individual student while working closely with the second supervisor and other faculty members to focus on supervising their students.

Students are required to decide a research theme that integrates multiple scientific disciplines and is related to innovative science and technology under the guidance of your supervisor. Students must submit a research proposal in writing by the end of the first year based on the ideas of a research topic related to the research theme which must be confirmed by your supervisor and second supervisor. Based on the research proposal submitted, students will receive research instructions with the integration of different fields in mind. The supervisor is expected to help students summarize their research outcomes in a form of a thesis/dissertation and provide guidance related to bibliographic research and research activities.

#### 1.2 Second supervisor

The second supervisor provides students with advice and guidance from a different perspective to that of the supervisor while working closely with the supervisor so that the research of the student will integrate multiple scientific disciplines.

With the advice and guidance of your second supervisor from a different perspective to that of your supervisor related to research theme, students will deepen the knowledge of their own research theme while learning ways of approaching your research from different fields through joint research, discussions or group study with the second supervisor and other students.

Although advice and guidance by the second supervisor from Kanazawa University should be ideally given in person, video conferencing systems such as Skype may also be used as required.

### 2 Research guidance at other graduate institutes

(1) Receiving guidance at other graduate institutes

Under the guidance of the supervisor, you can conduct part of the major research project at another graduate institute except with full-time faculty at Kanazawa University.

(2) Research period

A research period at other graduate institutes should be no longer than 12 months for the master's program and 18 months for the doctoral program.

(3) Procedures

If you wish to receive research guidance at another graduate institute outside JAIST, you must submit an "Entrustment of Research Guidance Outside JAIST" form at least two months prior to the start of research to Kyoumu through your supervisor.

## 3 Ph.D. Qualifying Examination

Those who choose Survey for Doctoral Research Plan must contact Kyoumu.

## VII. Matters related to conferment of degree

The conferment of a degree will be conducted on specified dates in March or September.

### 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 the "Bylaws Related to the Defense for Granting the Master's Degree" and other arrangements.

### 1.1 Application for conferment of degree

When you have met all the degree completion requirements except for "Research Support Courses" and wish to apply for a degree conferment, you must submit an Application for Conferment of Degree and the necessary documents to Kyoumu with your supervisor's approval. Note that those who choose Survey for Doctoral Research Plan will apply for a degree conferment after you have passed the Ph.D. qualifying examination and internal entrance examination for doctoral program at JAIST.

The deadline for submitting the Application for Conferment of Degree will be two months before the scheduled completion month. The deadline for those who wish to graduate in September will be three months before the scheduled completion month.

### 1.2 Submission of master's thesis or research project report

Degree applicants in Master's Thesis Project or Research Project must submit the master's thesis or research project report through the prescribed submission method on the date specified by JAIST to Kyoumu with your supervisor's approval. Note that names of the examination committee will be announced accordingly along with the thesis presentation schedule.

Those who choose Survey for Doctoral Research Plan will be notified separately regarding this matter.

### 1.3 Mid-term presentation and thesis presentation

In preparation for the defense of the master's thesis, the mid-tern presentation on research activities will take place in the first half of the second year and the master's thesis presentation will take place in the second half of the second year. Students will receive comprehensive advice on your future research at the mid-term presentation. Also, the presentations will be made public to faculty in other divisions at both JAIST and Kanazawa University.

### 1.4 Master's thesis defense

The master's thesis defense will be held at JAIST. The examination committee will consists of at least three faculty members; at least two faculty members from JAIST and at least one faculty member from Kanazawa University. The evaluations and opinions given at the mid-term presentation and the thesis presentation will be taken into consideration at the defense. The thesis will also be checked against research ethics.

### 1.5 Conferment of degree

Based on the result of the master's thesis defense above, conferment of degree will be discussed by the liaison council established by JAIST and Kanazawa University. At the liaison council, in addition to the evaluations and opinions given at the mid-term presentation and the thesis presentation as well as the result of the master's thesis defense, students will be evaluated based on the contribution of their research to solving social problems mentioned in the "3 challenges", the level of completion of the `Four "Forces" (Force)' and five types of competency listed in the Diploma Policy, which are 1. Competency to solve problems, 2. Expertise knowledge and practical skills, 3. Understanding and active attitude to other disciplines, 4. Language proficiency for communication and 5. Research ethics. With the evaluations at the liaison council and after deliberations at a faculty meeting, a decision will be made to confer a degree.

**(Reference) Degree conferment schedule for the master's program**

The standard schedule for those enrolled in April to complete the program in two years is shown below. The schedule shows only some main items. You must check the detailed information in other pages of this guide and other announcements and notifications made by JAIST.

○ **For those who selected Master's Thesis Project/Research Project**

| Month | First Year | Second Year |
|---|---|---|
| April | - Temporary lab assignment<br>*Assignment to a faculty member (JAIST) who will be your advisor<br>- Take Core Courses<br>*Should be taken between Term 1-1 and Term 2-1 | |
| May | | |
| June | - Laboratory inquiry<br>*Also register one of the 3 challenges<br>- Formal lab assignment<br>*Official assignment of a supervisor (JAIST) | |
| July | | |
| August | - Take Transdisciplinary Session I<br>- Course instructor inquiry for Transdisciplinary Laboratory rotation I<br>- Second supervisor (KU) inquiry<br>- Participate in an internship<br>*Should be completed in the first year if possible | - Mid-term presentation |
| September | - Official assignment of a course instructor for Transdisciplinary Laboratory rotation I<br>- Official assignment of a second supervisor (KU) | |
| October | - Transdisciplinary Laboratory rotation I begins<br>*Should be completed by February in the first year | |
| November | | |
| December | | |
| January | | - Submit an application for conferment of degree |
| February | | - Submit master's thesis/research project report<br>- Thesis presentation<br>- Defense of thesis/research project report |
| March | - Submit a research proposal | - Degree conferment |

○ **For those who selected Survey for Doctoral Research Plan**

| Month | First Year | Second Year |
|---|---|---|
| April | - Temporary lab assignment<br>*Assignment to a faculty member (JAIST) who will be your advisor<br>- Take Core Courses<br>*Should be taken between Term 1-1 and Term 2-1 | |
| May | | |
| June | - Laboratory inquiry<br>*Also register one of the 3 challenges<br>- Formal lab assignment<br>*Official assignment of a supervisor (JAIST) | |
| July | | - Submission of application for Ph.D. Qualifying Examination (To Be announced)<br>- Application for the Internal Entrance Examination for Doctoral Program |
| August | - Take Transdisciplinary Session I<br>- Course instructor inquiry for Transdisciplinary Laboratory rotation I<br>- Second supervisor (KU) inquiry<br>- Participate in an internship<br>*Should be completed in the first year if possible | - Mid-term presentation<br>- Internal Entrance Examination for Doctoral Program |
| September | - Official assignment of a course instructor for Transdisciplinary Laboratory rotation I<br>- Official assignment of a second supervisor (KU) | |
| October | - Transdisciplinary Laboratory rotation I begins<br>*Should be completed by February in the first year | - Submit a report of Survey for Doctoral Research Plan (To Be announced)<br>- Ph.D. Qualifying Examination (To Be announced) |
| November | | |
| December | | |
| January | | - Submit an application for degree conferment |
| February | | |
| March | - Submit a research proposal<br>*Register your choice of Survey for Doctoral Research Plan | - Conferment of degree |

## 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 the "Bylaws Related to the Defense for Granting the Doctoral Degree" and other arrangements.

### 2.1 Check sheet

Students must submit a check sheet about their level of achievement in transdisciplinary sciences to Kyoumu prior to the Thesis Pre-Defense and defense of their dissertation. The check sheet includes questions on what field of knowledge and technology are applied in relation to one's research topic and how those two are integrated (Criteria 1 of Section 2.7) and what kind of new knowledge it generates (Criteria 2). As for Criteria 3, students will be evaluated in the final defense mentioned in Section 2.6.

### 2.2 Dissertation outline

After gaining the approval of all three advisors, a dissertation outline must be submitted to Kyoumu at least six months before applying for a degree.
Students who wish for fast-track degree completion should first consult with their supervisor and set an earlier outline submission deadline. Then they need to notify their plan for fast-track degree completion to the dean via the supervisor.

### 2.3 Thesis Pre-Defense

Students must go through Thesis Pre-Defense prior to applying for a degree. The Thesis Pre-Defense is conducted by committee members from the degree awarding committee mentioned in Section 2.6 and takes place at least three months before conferment of a degree. At the Thesis Pre-Defense, guidance is given based on whether the research achievement is adequate for applying for a doctoral degree as valuable human resources of innovative science and technology in light of the educational mission of this collaborative program. Particular focus will be on whether the achievement is adequate for applying for a doctoral degree (Transdisciplinary Sciences) in light of the educational mission of this collaborative program. Following the result of the Thesis Pre-Defense, further advice is given to students for obtaining a doctoral degree (Transdisciplinary Sciences) and the result is returned to the supervisor and the students for feedback. The supervisor and the second supervisors then thoroughly examine the result and give instructions to their students for finishing a dissertation. Note that students must have earned the required number of credits for degree completion (at least 13 credits) by the time of Thesis Pre-Defense excluding "Seminar and Exercise II" and "Doctoral Thesis Report II".

### 2.4 Application for conferment of degree

Those who apply for conferment of degree must submit an application for conferment of degree and other required documents to Kyoumu with the approval of their supervisor.
The deadline for submitting the Application for Conferment of Degree will be two months before the scheduled completion month. The deadline for those who wish to graduate in September will be three months before the scheduled completion month.

### 2.5 Submission of doctoral dissertation

Those who apply for conferment of degree must submit a doctoral dissertation in the designated method by the designated date by JAIST to Kyoumu with the approval of their supervisor. Note that the committee members and the schedule for the dissertation defense will be separately announced by Kyoumu.

### 2.6 Dissertation defense

A formal hearing and final examination will be held for the final dissertation defense. Students will first present their dissertation to faculty members and students from both universities at the formal hearing and then take the final defense and the final examination by the degree awarding committee. The degree awarding committee consists of at least five faculty members in total including at least

two members from JAIST and at least one member from Kanazawa University.

### 2.7 Conferment of degree

Based on the result of the dissertation defense above, conferment of degree will be discussed by the liaison council established by JAIST and Kanazawa University. At the liaison council, factors such as the result of the dissertation defense and the number of credits earned will be taken into consideration. With the result of the liaison council deliberation, each of collaborative university will hold faculty meetings for conclusion. After that, JAIST and Kanazawa University will confer a degree to students respectively. Note that dissertations will be published in a research repository of the relevant university.

The conferment of a doctoral degree will be decided based on whether or not students have completed the learning achievements specified in the Diploma Policy in light of the fact that the educational mission of this collaborative program is to progress transdisciplinary sciences, in addition to factors such as whether or not the research contributes to solving problems related to innovative science and technology and the novelty and uniqueness of the research in the field of science and engineering with the knowledge and skills of multiple scientific fields acquired. Upon the conferral of a degree, it is made obligatory to publish one's dissertation in international journals or present it at academic conferences in order to ensure a decent standard of research outcomes. In particular, the following criteria will be applied for the evaluation of "Ability to create new knowledge by integrating one's own accademic discipline and others" from the Diploma Policy with the acquisition of Doctoral Degree (Transdisciplinary Sciences) in mind.

1. Does the dissertation incorporate ideas from transdisciplinary sciences and integrate the knowledge and technology of multiple fields?
2. Do the research outcomes lead to the creation of new knowledge?
3. Does the composition of the dissertation incorporate perspectives of transdisciplinary sciences?

Note that the dissertation will still be evaluated for the conferral of Doctoral Degree (Science) or Doctoral Degree (Engineering) even when it does not meet the standards for the conferral of Doctoral Degree (Transdisciplinary Sciences).

**(Reference) Degree conferment schedule for the doctoral program**

The standard schedule for those enrolled in April to complete a program in three years is shown below. The schedule shows only some main information. You must check the detailed information in the related pages of this guide and announcements and notifications made by JAIST.

| Month | First Year | Second Year | Third Year |
|---|---|---|---|
| April | - Formal lab assignment<br>*Official assignment of a supervisor (JAIST)<br>- Second supervisors inquiry (KU/JAIST)<br>*Also register one of the 3 challenges<br>- Take Specialized Courses<br>*Should be taken between Term 1-1 and Term 2-1 | | |
| May | - Official assignment of second supervisors (KU/JAIST)<br>- Course instructor (KU) inquiry for Transdisciplinary Laboratory rotation II<br>*Course instructor will be officially assigned by September in the first year<br>- Transdisciplinary Laboratory rotation II begins<br>*Should be completed by September in the second year | | |
| June | | | |
| July | | | - Submit dissertation outline |
| August | - Take Transdisciplinary Session II<br>*Should be completed by March in the second year<br>- Participate in Research Challenge / International Internship<br>*Should be completed by September in the second year | | |
| September | | | |
| October | | | |
| November | | | |
| December | | | - Thesis Pre-Defense |
| January | | | - Submit an application for conferment of degree<br>- Submit doctoral dissertation |
| February | | | - Final defense and examination |
| March | - Submit a research proposal | | - Conferment of degree |

## VIII. Education and Training Programs offered by Global Communication Center

### 1 The Outline of Global Communication Center (GCC)

Japan has become increasingly affected by the trend of globalization. Many corporations now focus on overseas operations. The objectives of postgraduate education today should place great emphasis not only on fostering highly specialized researchers and engineers of advanced science and technology, but also on the development of individuals who can exercise leadership globally with a broad perspective. It is absolutely imperative for global leaders to acquire advanced and practical communication skills and abilities. GCC at JAIST prepares students for their future activities on the global stage by providing carefully designed education and training programs for all the students to improve their English communication skills and abilities and for international students to master necessary level of Japanese language proficiency.

We consider standard language proficiency tests as one of the means to measure the improvement in language acquisition. All the students are expected to have achieved 600 points or above in TOEIC test by the time of graduation. TOEIC scores are utilized to help them decide which level of English courses to take. For example, students with a TOEIC score of 499 points or below would take Interaction Seminars (E011, E021) and those with a score above 500 points and below 599 points Introduction to Technical English (E111, E112, E113). International students who need Japanese language proficiency for employment in Japan are expected to achieve Level B1 of the JF Japanese Language Education Standard.

### 2 Global Communication Center Education Programs

Anyone who wishes to take an active role in the globalizing world, technical communication skills are indispensable. To develop the skills, GCC offers systematic technical English communication education program (courses numbered as Exxx) and technical Japanese language education program (courses numbered as Jxxx) covering from basic to advanced levels. In addition, there are courses of intercultural understanding and special communication skills to reinforce language acquisition (courses numbered as Gxxx).

Technical English communication education program consists of twelve courses in four levels from Interaction Seminar to Advanced Technical English aiming at improving students' communication skills from basic to technical communication in the field of science and technology. Technical Japanese language education program serves international students with eight courses in four levels from introductory to advanced to improve their Japanese language ability from basic to communication for business or the field of science and technology. In addition, to reinforce the language education and develop adaptability to a culturally diverse global society, Global Communication for Building Collaboration, Skills in Language Expressions, and others are offered.

In order to improve your motivation/knowledge to play an active part in the global stage with acquired language skills and develop the inner resources to be a global leader, GCC also provides the content subjects that consist of 3 English courses called Global Communication for Collaboration Building, Japan Studies and Diversity Studies, and 1 Japanese course called Writing and Presentation Skills.

For details of each course, refer to the chapter entitled "Courses and Class Schedules" and the course syllabi.

Students must take a language course adequate to the level of their current language ability.

This program offers you the following practical courses.

#### 2.1 Practical English Special Seminar

There are three-day English Intensive Seminars (held in summer and winter) intended for students with the TOEIC IP score of 600 or below. The seminars help students obtain profound interest and positive attitude in studying English through 24 hours of intensive discussions, presentations and conversations.

### 2.2 Practical Japanese Special Seminar

There is a three-day Japanese Intensive Seminar in summer intended for international students with N1 or N2 level of JLPT. The seminar helps students obtain Japanese language ability to prepare for employment at a Japanese corporation through 24 hours of intensive discussions, presentations and conversations.

### 2.3 Global Leadership Training Seminar

To contribute to producing intellectually tough global leaders, GCC offers workshops intended for students who wish to study abroad with a special focus on India. A workshop of intensive discussion training is conducted in English once a week after five class periods year round. Students will totally attend 40 workshops and complete them in a year.

## 3 Global Communication Center Training Programs

### 3.1 TOEIC IP

For students to measure their level of achievement in English study, TOEIC IP are carried out on campus. Ishikawa Campus students must take their first TOEIC IP when they enter JAIST and their second TOEIC 18 months after enrollment. (When necessary, students can take the tests on the different dates.)
Since JAIST aims at having all the graduates carry 600 points or above in TOEIC, any student whose score of the second TOEIC IP has not reached the target needs to take the next TOEIC IP.
Students in the program for Working Professionals in Tokyo can take any scheduled TOEIC IP based on their need.

**Test schedule**

On the Ishikawa Campus

1. **TOEIC IP***
   April, 2021 (Dates to be announced)
2. **TOEIC IP**
   Friday, August 6, 2021 15: 30 ~ 18:00
3. **TOEIC IP***
   October, 2021 (Dates to be announced)
4. **TOEIC IP**
   Friday, February 18, 2022 15: 30 ~ 18:00

*NOTE : TOEIC IP in April and October are limited only for object students.

### 3.2 TOEIC Preparation Training Workshops

To prepare for the TOEIC IP test scheduled four times at Ishikawa Campus, GCC offers TOEIC Preparation Training Workshops from four to eight times a year. Student who apply for academic exchanges with overseas institutions in middle or long term (longer than one month) are strongly recommended to participate in these workshops if you have not achieved the target score, 730.

### 3.3 JLPT Preparation Workshops

In preparation for the Japanese Language Proficiency Test (JLPT), which will be held in July and December, the GCC holds JLPT preparation workshops.

### 3.4 JAIST - Nomi City Collaborative Japanese Language Courses

Based on the "Industry-Academia-Government Collaboration Agreement" concluded between Nomi City and JAIST on March 27, 2006, the following Japanese language classes will be held for international students, researchers, faculty members and their families who wish to learn Japanese.
(1) Japanese Language Class
Staff and volunteers from the Nomi International Association hold "Japanese Language Class" on the JAIST campus to provide practical instruction in Japanese. Class are held once a week for 90 minutes and are held throughout the year, except for the summer and New Year vacations.

(2) Japanese Culture Classes

Japanese culture classes are held to provide students with opportunities for direct contact with Japanese society and culture, including tours of public facilities and institutions in Nomi City and short homestays at the Nomi Citizen's Home. (Held Irregularly)

## IX. Systems in place

### 1 Extended study period for completion

Students may be granted extension of your study period when you face difficulty in completing the degree within the standard study period due to fair reasons related to their work or some personal affairs. Students who wish to extend study period must check the JAIST website (Education → Academic Procedures → Extended Study Period for Completion) and contact Kyoumu to apply by the designated deadline.

### 2 Progression within JAIST

Students who have completed a master's program at JAIST and wish to continue onto the doctoral program must check the Application Guide or the JAIST website (Education → Application Guide for Internal Entrance Examination for Doctoral Program) to apply for the Internal Entrance Examination.

### 3 Academic rules

Check the website (https://education.joureikun.jp/jaist/) in regards to the details of the general academic rules, the regulations and bylaws on degree completion, course taking, collaborative education and research facility courses, and matters relevant to conferment of Master's and Doctoral degree.

# Courses and Class Schedules (JAIST)

# Courses and Class Schedules (JAIST)

## 1 Overview (JAIST)

Each course has its course number which consists of an alphabet (K=Knowledge Science course group, I=Information Science course group, M=Materials Science course group, and the same applies to other alphabets.), indicating the school of the course instructor, followed by three-digit numbers. The letter E at the end of the course number indicates that the course is conducted in English (K/I/MxxxE). Some courses at JAIST are offered both in Japanese and English in the same academic year.

### 1.1 Courses

The tables in Section 2 below list the courses offered by the Division of Transdisciplinary Sciences at JAIST with information of language, terms and instructors. The number of credits per course for Specialized Courses is 2 and the exceptions are indicated in the "Note" row. Check the syllabi for details about each course.

The J, E, EJ codes in the language row indicate the language of instruction: J indicates the course is conducted in Japanese; E, English; EJ in both English and Japanese. If a course has multiple instructors, either "," or "•" are used between the names. "," indicates each instructor teaches the course and "•" indicates the course is taught by all the instructors in turns (course in relay). See the faculty profiles page on the web for more information about the course instructors (JAIST top page → Research → Faculty Profiles).

### 1.2 Class schedules

The tables in Section 3 below show the class schedules offered by the Division of Transdisciplinary Sciences at JAIST. At JAIST, each course is held twice a week except for intensive courses and the courses with irregular timetables. K･I･Mxxx courses are held in the morning (1st and 2nd period) and 4th period of Tuesday and Thursday. 3rd period is for the tutorial hours for the 1st period class on that day. Students can ask questions or discuss with the instructor during the tutorial hours and the time can be used for exercises, supplemental instruction etc. Note that K･I･Mxxx Courses held at 4th period of Tuesday and Thursday have no tutorial hours. Sxxx courses are held at 4-5$^{th}$ period of Fridays. The Examination Terms ordinary come after the end of each lecture term, however the examinations of intensive courses are exceptionally conducted after finishing all the lectures in general. Class schedules with the assigned rooms will be displayed on the bulletin board next to the automatic certificate issuing machine and on the JAIST website (Division of Transdisciplinary Sciences, Graduate School of Advanced Science and Technology (hyperlink button) → For Student → Class Schedule (JAIST)). You must check the schedule before the start of classes each term.

This class schedule includes courses offered by the Division of Advanced Science and Technology. The courses offered in the master's program of the Division of Transdisciplinary Sciences are indicated by ◆ next to the name of the course instructor and the courses offered in the doctoral program of the Division of Transdisciplinary Sciences are indicated by □ next to the name of the course instructor. Check the syllabi for details about each course offered by the Division of Advanced Science and Technology. Note that courses offered in the master's program of the Division of Transdisciplinary Sciences at JAIST are held mainly on Tuesdays and Thursdays.

## ２－１ Master's Program Courses for 2021-2022 (JAIST)

### ○ Core Courses

| Course Number | Course Title | Lan-guage | Course Term | | Instructor(s) | Note |
|---|---|---|---|---|---|---|
| | | | 1-1<br>1-2 | 2-1<br>2-2 | | |
| S101 | Innovation Theory and Methodology for Social Competencies | J/E | 1-1 | 2-1 | KOHDA et al. | 1 credit, Required elective course |
| S102 | Innovation Theory and Methodology for Creativity | J/E | 1-1 | 2-1 | KOHDA et al. | 1 credit, Required elective course |
| I119 | Statistics for Data Analytics | J | 1-1 | | AKAGI | 2 credits, Required elective course |

Note : S101 and S102 are simultaneously offered in both Japanese and English (in separate rooms).

### ○ Transdisciplinary Experience Courses

| Course Number | Course Title | Lan-guage | Course Term | | Instructor(s) | Note |
|---|---|---|---|---|---|---|
| | | | 1-1<br>1-2 | 2-1<br>2-2 | | |
| T001 | Transdisciplinary Session I | J | Summer | | Faculties at Division of Transdisciplinary Sciences (KU and JAIST) | 2 credits, Required course |
| T004 | Transdisciplinary Laboratory Rotation Ia (JAIST) | | | | Faculties, et al. at Division of Transdisciplinary Sciences (JAIST) | 1 credit, Required elective course |
| T005 | Transdisciplinary Laboratory Rotation Ib (JAIST) | | | | | 1 credit, Required elective course |

Note : For T001, 1 out of 2 credits will be counted as earned at Kanazawa University(KU).

### ○ Social Impremention Courses

| Course Number | Course Title | Lan-guage | Course Term | | Instructor(s) | Note |
|---|---|---|---|---|---|---|
| | | | 1-1<br>1-2 | 2-1<br>2-2 | | |
| T011 | Industrial Internship a (JAIST) | | | | Supervisor | 1 credit, Required elective course |
| T012 | Industrial Internship b (JAIST) | | | | Supervisor | 2 credits, Required elective course |
| T013 | Research Internship a (JAIST) | | | | Supervisor | 1 credit, Required elective course |
| T014 | Research Internship b (JAIST) | | | | Supervisor | 2 credits, Required elective course |

## ○ Specialized Courses

### ・Common Subjects

| Course Number | Course Title | Lan-guage | Course Term 1-1 1-2 | Course Term 2-1 2-2 | Instructor(s) | Note |
|---|---|---|---|---|---|---|
| K121 | Introduction to Cognitive Science | J | 1-2 | | TORII・HIDAKA | |
| K236 | Basis of Data Analytics | EJ | 1-2 | | Dam・GOKON・Nguyen N | |
| K238 | Introduction to Experimental Philosophy | J | 1-1 | | MIZUMOTO | |
| | | E | ※ | ※ | | |
| K417 | Data Analytics | EJ | | 2-1 | Dam・GOKON | |
| K427 | Theory on Creative Process in Design | EJ | ※ | ※ | NAGAI・MAEKAWA | Offered in alternate years |
| I111 | Algorithms and Data Structures | J | 1-1 | | IKEDA K・Hsueh | |
| | | E | | 2-1 | Schwartzman・Viglietta | |
| I116 | Fundamentals of Programming | J | 1-2 | | HIROKAWA | |
| | | E | 1-1 | | Chong・Elibol | |
| I121 | Algebra for Computer Scientist | E | 1-2 | | OGAWA | |
| I211 | Mathematical Logic | E | 1-1 | | ISHIHARA・KAWAI | |
| | | J | | 2-1 | YOKOYAMA・OGAWA | |
| I212 | Analysis for Information Science | J | 1-1 | | KOTANI | |
| | | E | | 2-1 | Dang | |
| I237 | Formal Languages and Automata | J | 1-1 | | TOJO | |
| | | E | | 2-1 | OGAWA | |
| I238 | Computation Theory | E | 1-1 | | Schwartzman・Viglietta | |
| | | J | | 2-2 | ISHIHARA | |
| I419 | Image Information Science | J | 1-2 | | YOSHITAKA | Offered in alternate years |
| I468 | Modeling of Dynamics | J | ※ | ※ | MAEZONO | Offered in alternate years |

Note : * indicates the course is not offered in the 2021 academic year.

### ・Life Science Subjects

| Course Number | Course Title | Lan-guage | Course Term 1-1 1-2 | Course Term 2-1 2-2 | Instructor(s) | Note |
|---|---|---|---|---|---|---|
| M113 | Introduction to Bioscience | J | 1-1 | | TAKAGI・SHIMOKAWA | |
| M231 | Bioorganic Chemistry | J | 1-1 | 2-1 | FUJIMOTO・HOHSAKA | |
| M232 | Biophysics and Biophysical Chemistry | J | 1-2 | | HAMADA | |
| M261 | Functional Biomolecules | J | | 2-1 | TSUTSUI H | |
| M262 | Biomaterial Sensing | J | 1-2 | | TAKAMURA YUZURU | |
| M415 | Medical Biomaterials | J | | 2-2 | TSUKAHARA | |

## ･Materials Science Subjects

| Course Number | Course Title | Lan-guage | Course Term 1-1 1-2 | Course Term 2-1 2-2 | Instructor(s) | Note |
|---|---|---|---|---|---|---|
| M111 | Introduction to Physics | J | 1-1 | | HORITA | |
| | | E | | 2-1 | MIZUTANI | |
| M112 | Introduction to Chemistry | J | 1-1 | | TANIIKE･MIYAKO | |
| M211 | Quantum Mechanics | J | 1-2 | 2-1 | MURATA, OSHIMA | |
| M212 | Statistical Mechanics | J | | 2-2 | KOYANO | |
| M213 | Electromagnetic Theory | J | 1-1 | | TOMITORI | |
| M221 | Organic Chemistry | J | 1-1 | | MATSUMI | |
| M222 | Computational Material Design | J | 1-2 | | TANIIKE･Dam･MIYATA M | |
| M223 | Properties of Organic Materials | J | | 2-1 | NAGAO･MATSUMI | |
| M224 | Inorganic Materials Chemistry | J | 1-2 | | MAENOSONO | |
| M225 | Instrumental Analytical Chemistry | J | 1-2 | | SHINOHARA | |
| M243 | Solid State Physics I | J | 1-2 | | TAKAMURA YUKIKO | |
| M245 | Mathematics for Condensed Matter Science and Technology | J | 1-1 | 2-1 | OHDAIRA, An | |
| M251 | Chemistry of Catalyst and Catalysis | J | 1-1 | | NISHIMURA | |
| M254 | Polymer Chemistry I | J | 1-2 | | KANEKO T･OKEYOSHI | |
| M273 | Mechatronics | EJ | 1-1 | | Ho | |
| M414 | Device Physics | J | | 2-2 | TOKUMITSU | |
| M420 | Solid State Physics II | J | | 2-2 | AKABORI | |

## ･Social Systems Science Subjects

| Course Number | Course Title | Lan-guage | Course Term 1-1 1-2 | Course Term 2-1 2-2 | Instructor(s) | Note |
|---|---|---|---|---|---|---|
| K211 | Methodology for the Social Sciences | J | 1-1 | | SHIKIDA･GOKON･SATO T･ TAKASHIMA･TORII･SATO N･HIGA | |
| | | E | 1-1 | | Kim | |
| K214 | Methodology for Knowledge Media | J | 1-2 | | SATO T | |
| | | E | | 2-2 | KANAI | |
| K471 | Media Creation | J | 1-1 | | MIYATA K･Xie | |
| K473 | Management of Innovation | J | 1-2 | | UCHIHIRA | |
| K479 | Service Management | J | ※ | ※ | SHIRAHADA | |
| K487 | Network Science | J | 1-1 | | HAYASHI･MIZUTAKA | |
| I213 | Discrete Signal Processing | J | 1-2 | | ASANO | |
| | | E | | 2-2 | Chong | |

| Course Number | Course Title | Lan-guage | Course Term 1-1 1-2 | Course Term 2-1 2-2 | Instructor(s) | Note |
|---|---|---|---|---|---|---|
| I214 | System Optimization | J | 1-1 | | KANEKO M･HIRAISHI | |
| | | E | | 2-2 | Kurkoski･KANEKO M | |
| I218 | Computer Architecture | J | 1-1 | | TANAKA | |
| | | E | | 2-2 | INOGUCHI | |
| I219 | Software Design Methodology | J | 1-2 | | AOKI･ISHII･KAWAI | |
| | | E | | 2-2 | AOKI･ISHII | |
| I223 | Natural Language Processing | E | 1-2 | | Nguyen L | |
| | | J | | 2-1 | SHIRAI | |
| I225 | Statistical Signal Processing | E | 1-1 | | MAEZONO･NAKANO | |
| | | J | | 2-1 | HONGO | |
| I233 | Operating Systems | J | 1-1 | | SHINODA･UDA | |
| | | E | | 2-1 | | |
| I235 | Game Informatics | J | 1-1 | | IKEDA K･IIDA･Hsueh | |
| | | E | | 2-2 | IKEDA K･Khalid･Hsueh | |
| I411 | Pattern Analysis and Recognition | J | ※ | ※ | KOTANI･Siritanawan | Offered in alternate years |
| I443 | Foundation of Software Verification | J | ※ | ※ | AOKI･KAWAI | Offered in alternate years |

Note : * indicates the course is not offered in the 2021 academic year.

## ○ Research Support Courses

| Course Number | Course Title | Lan-guage | Course Term 1-1 1-2 | Course Term 2-1 2-2 | Instructor(s) | Note |
|---|---|---|---|---|---|---|
| T008 | Master Thesis Report I (JAIST) | | | | Supervisor | 6 credits, Required elective course |
| T009 | Research Project (JAIST) | | | | Supervisor | 2 credits, Required elective course |
| T010 | Research Planning for Ph.D Course (JAIST) | | | | Supervisor | 2 credits, Required elective course |

## ２－２ Doctor's Program Courses for 2021-2022 (JAIST)

### ○ Transdisciplinary Experience Courses

| Course Number | Course Title | Lan-guage | Course Term | | Instructor(s) | Note |
|---|---|---|---|---|---|---|
| | | | 1-1<br>1-2 | 2-1<br>2-2 | | |
| T051 | Transdisciplinary Session Ⅱ | J | Summer | | Faculties at Division of Transdisciplinary Sciences (KU and JAIST) | 2 credits, Required course |
| T053 | Transdisciplinary Laboratory Rotation Ⅱ (JAIST) | | | | Faculties, et al. at Division of Transdisciplinary Sciences (JAIST) | 1 credit |

Note 1: For T051, 1 out of 2 credits will be counted as earned at Kanazawa University(KU).
Note 2: Students completing T052 (Transdisciplinary Laboratory Rotation Ⅱ(KU)) are eligible to take T053.

### ○ Social Impremention Courses

| Course Number | Course Title | Lan-guage | Course Term | | Instructor(s) | Note |
|---|---|---|---|---|---|---|
| | | | 1-1<br>1-2 | 2-1<br>2-2 | | |
| T054 | Overseas Research Challenge A(JAIST) | | | | Supervisor | 1 credit, Required elective course |
| T055 | Overseas Research Challenge B(JAIST) | | | | Supervisor | 2 credits, Required elective course |
| T056 | Overseas Research Challenge C(JAIST) | | | | Supervisor | 4 credits, Required elective course |
| T057 | International Internship(JAIST) | | | | Supervisor | 1 credit, Required elective course |

## ○ Specialized Courses

### ・Common Subjects

| Course Number | Course Title | Lan-guage | Course Term 1-1 1-2 | Course Term 2-1 2-2 | Instructor(s) | Note |
|---|---|---|---|---|---|---|
| S503 | Innovation Theory and Methodology for Total Capability Development | J / E | 1-1 | 2-1 | KOHDA et al. | 1 credit, Required elective course |
| K485 | Public Economics for Community Management | J | Summer | | YAMAMOTO T･SHIN | |
| K619 | Advanced Data Analytics | E | ※ | ※ | Dam･GOKON | Offered in alternate years |
| I119 | Statistics for Data Analytics Ⅱ | J | 1-1 | | AKAGI | |

Note 1: * indicates the course is not offered in the 2021 academic year.
Note 2: S503 is simultaneously offered in both Japanese and English (in separate rooms).
Note 3: I119 is storongly recommended to the students who have never studied statistics etc. before.
However, its credits can not be counted for degree completion requirements.

### ・Life Science Subjects

| Course Number | Course Title | Lan-guage | Course Term 1-1 1-2 | Course Term 2-1 2-2 | Instructor(s) | Note |
|---|---|---|---|---|---|---|
| M423 | Functional Protein Device | J | 1-2 | | HIRATSUKA | |
| M615 | Advanced Biofunctions | E | 1-1 | | TAKAGI･TAKAMURA YUZURU | Offered in alternate years |
| M616 | Advanced Biomaterials | E | | 2-1 intensive | HIRATSUKA･TSUTSUI H･HAMADA･NAGAI K | Offered in alternate years |
| M622 | Advanced Biomolecular Science | E | ※ | ※ | OHKI･YAMAGUCHI T | Offered in alternate years |

Note: * indicates the course is not offered in the 2021 academic year.

### ・Materials Science Subjects

| Course Number | Course Title | Lan-guage | Course Term 1-1 1-2 | Course Term 2-1 2-2 | Instructor(s) | Note |
|---|---|---|---|---|---|---|
| M413 | Functional Nanomaterials | E | | 2-1 | MAENOSONO･NAGAO･YAMAMOTO Y･NISHIMURA | |
| M421 | Electronics | J | | 2-1 | SUZUKI T | |
| M424 | Polymer Chemistry II | J | | 2-1 | YAMAGUCHI M･MATSUMURA | |
| M425 | Analytical Mechanics | E | | 2-1 | Ho | |
| M612 | Optical Properties of Solids | E | ※ | ※ | MIZUTANI･MURATA･KOYANO | Offered in alternate years |
| M614 | Advanced Device Physics | E | | 2-1 | OHDAIRA･TOKUMITSU | Offered in alternate years |
| M617 | Molecular and Functionality Design of Polymers | E | ※ | ※ | KANEKO T･OKEYOSHI･SHINOHARA･YAMAGUCHI M | Offered in alternate years |
| M618 | Materials Design | E | 1-2 intensive | | MATSUMURA･MIYAKO･Rajan･Misra | Offered in alternate years |
| M619 | Materials Morphology | E | ※ | ※ | MATSUMI･TANIIKE･Badam･Kabeer | Offered in alternate years |
| M620 | Electronic Properties of Condensed Matter | E | | 2-2 intensive | OSHIMA･KOYANO･An･Muruganathan | Offered in alternate years |

Note: * indicates the course is not offered in the 2021 academic year.

## ･Social Systems Science Subjects

| Course Number | Course Title | Lan-guage | Course Term | | Instructor(s) | Note |
|---|---|---|---|---|---|---|
| | | | 1-1<br>1-2 | 2-1<br>2-2 | | |
| K412 | Anthropology of Knowledge | J | 1-2 | | ITO･HIGA | |
| K469 | Knowledge Creation Support Media | J | 1-1 | | NISHIMOTO | |
| K613 | Social-Technical Complex Systems | E | 1-2 | | Huynh | Offered in alternate years |
| K626 | Advanced Topics in Media Design | E | ※ | ※ | NISHIMOTO･MIYATA K･HIDAKA･KANAI･UTSUMI･SATO T･Xie･TAKASHIMA･TORII | Offered in alternate years |
| I441 | Advanced Computer Networks | J | 1-2 | | SHINODA | Offered in alternate years |
| I448 | Distance Learning System | J | | 2-1 | HASEGAWA･OTA | Offered in alternate years |
| I470 | Theory of Advanced Algorithms | J | ※ | ※ | UEHARA | Offered in alternate years |
| I615 | Robotics and Computer Vision | E | ※ | ※ | Chong ・ Elibol | Offered in alternate years |
| I645 | Human Perceptual Systems and its Models | E | ※ | ※ | UNOKI | Offered in alternate years |
| I649 | Advanced Wireless Networks | E | ※ | ※ | Lim | Offered in alternate years |

Note: * indicates the course is not offered in the 2021 academic year.

## ○ Research Support Courses

| Course Number | Course Title | Lan-guage | Course Term | | Instructor(s) | Note |
|---|---|---|---|---|---|---|
| | | | 1-1<br>1-2 | 2-1<br>2-2 | | |
| T059 | Doctor Thesis Report Ⅱ(JAIST) | | | | Supervisor | 6 credits, Required course |

## 3 Class schedules for 2021-2022 （JAIST）

### Term 1-1：Class Term ( April 12 – June 3 ) 1st - 3rd
### Examination Term ( June 4 – June 8 )

※ ◆ indicates that the course is offered in Master's program of the Transdisciplinary Science Division. □ indicats it's for Doctoral program.

| | 1<br>9:00－10:40 | 2<br>10:50－12:30 | 3 |
|---|---|---|---|
| Mon. | K211E Methodology for the Social Sciences (Kim)◆<br>K470 Introduction to Knowledge Creation (YUIZONO)<br><br>I111 Algorithms and Data Structures (IKEDA K･Hsueh)◆<br>I120 Fundamentals of Logic and Mathematics (ISHIHARA)<br>I225E Statistical Signal Processing (MAEZONO･NAKANO)◆<br><br>M245 Mathematics for Condensed Matter Science and Technology (OHDAIRA)◆<br>M285E Bioscience and Biotechnology (YAMAGUCHI T･HAMADA･FUJIMOTO･TSUTSUI H･HOHSAKA) | K228 Introduction to Knowledge Science (HASHIMOTO･Dam)<br><br><br>I114 Fundamental Mathematics for Information Science (TOMITA)<br>I116E Fundamentals of Programming (Chong･Elibol)◆<br>I233 Operating Systems (SHINODA･UDA)◆<br>I483 Smart Embedded System Development (NAKATA)<br><br>M221 Organic Chemistry (MATSUMI)◆<br>M611E Electronic Structures of Solids and Surfaces (TOMITORI･MIZUTANI･TAKAMURA YUKIKO･Fleurence) | Tutorial Hours ( 13:30－15:10 ) |
| Tue. | K211 Methodology for the Social Sciences (SHIKIDA･GOKON･SATO T･TAKASHIMA･TORII･SATO N･HIGA)◆<br>K471 Media Creation (MIYATA K･Xie)◆<br><br>I211E Mathematical Logic (ISHIHARA･KAWAI)◆<br>I214 System Optimization (KANEKO M･HIRAISHI)◆<br>I218 Computer Architecture (TANAKA)◆<br>I237 Formal Languages and Automata (TOJO)◆<br><br>M113 Introduction to Bioscience (TAKAGI･SHIMOKAWA)◆<br>M284E Solid State Physics and its Application to Electronics II (OSHIMA･SUZUKI T･An) | K469 Knowledge Creation Support Media (NISHIMOTO)□<br>K487 Network Science (HAYASHI･MIZUTAKA)◆<br><br>I119 Statistics for Data Analytics (AKAGI)◆□<br>I212 Analysis for Information Science (KOTANI)◆<br>I235 Game Informatics (IKEDA K･IIDA･Hsueh)◆<br>I238E Computation Theory (Schwartzman･Viglietta)◆<br><br>M111 Introduction to Physics (HORITA)◆<br>M213 Electromagnetic Theory (TOMITORI)◆ | |
| Wed. | K125 Introduction to Systems Development for Knowledge Science Experiment / Survey (TAKASHIMA)<br><br><br>I112 Basics of Computer Systems (HONGO)<br>I115 Digital Logic and Computer Design (INOGUCHI･KAWANO)<br>I232E Information Theory (Kurkoski･Liu)<br><br>M112 Introduction to Chemistry (TANIIKE･MIYAKO)◆<br>M251 Chemistry of Catalyst and Catalysis (NISHIMURA)◆<br>M273EJ Mechatronics (Ho)◆<br>M615E Advanced Biofunctions (TAKAGI･TAKAMURA YUZURU)□ | K211E Methodology for the Social Sciences (Kim)◆<br>K470 Introduction to Knowledge Creation (YUIZONO)<br><br>I111 Algorithms and Data Structures (IKEDA K･Hsueh)◆<br>I120 Fundamentals of Logic and Mathematics (ISHIHARA)<br>I225E Statistical Signal Processing (MAEZONO･NAKANO)◆<br><br>M245 Mathematics for Condensed Matter Science and Technology (OHDAIRA)◆<br>M285E Bioscience and Biotechnology (YAMAGUCHI T･HAMADA･FUJIMOTO･TSUTSUI H･HOHSAKA) | |
| Thu. | K469 Knowledge Creation Support Media (NISHIMOTO)□<br>K487 Network Science (HAYASHI･MIZUTAKA)◆<br><br>I119 Statistics for Data Analytics (AKAGI)◆□<br>I212 Analysis for Information Science (KOTANI)◆<br>I235 Game Informatics (IKEDA K･IIDA･Hsueh)◆<br>I238E Computation Theory (Schwartzman･Viglietta)◆<br><br>M111 Introduction to Physics (HORITA)◆<br>M213 Electromagnetic Theory (TOMITORI)◆ | K211 Methodology for the Social Sciences (SHIKIDA･GOKON･SATO T･TAKASHIMA･TORII･SATO N･HIGA)◆<br>K471 Media Creation (MIYATA K･Xie)◆<br><br>I211E Mathematical Logic (ISHIHARA･KAWAI)◆<br>I214 System Optimization (KANEKO M･HIRAISHI)◆<br>I218 Computer Architecture (TANAKA)◆<br>I237 Formal Languages and Automata (TOJO)◆<br><br>M113 Introduction to Bioscience (TAKAGI･SHIMOKAWA)◆<br>M284E Solid State Physics and its Application to Electronics II (OSHIMA･SUZUKI T･An) | |
| Fri. | K228 Introduction to Knowledge Science (HASHIMOTO･Dam)<br><br>I114 Fundamental Mathematics for Information Science (TOMITA)<br>I116E Fundamentals of Programming (Chong･Elibol)◆<br>I233 Operating Systems (SHINODA･UDA)◆<br>I483 Smart Embedded System Development (NAKATA)<br><br>M221 Organic Chemistry (MATSUMI)◆<br>M611E Electronic Structures of Solids and Surfaces (TOMITORI･MIZUTANI･TAKAMURA YUKIKO･Fleurence) | K125 Introduction to Systems Development for Knowledge Science Experiment / Survey (TAKASHIMA)<br><br>I112 Basics of Computer Systems (HONGO)<br>I115 Digital Logic and Computer Design (INOGUCHI･KAWANO)<br>I232E Information Theory (Kurkoski･Liu)<br><br>M112 Introduction to Chemistry (TANIIKE･MIYAKO)◆<br>M251 Chemistry of Catalyst and Catalysis (NISHIMURA)◆<br>M273EJ Mechatronics (Ho)◆<br>M615E Advanced Biofunctions (TAKAGI･TAKAMURA YUZURU)□ | |

**NOTE:**

The class schedule of the courses with the assigned lecture rooms will be posted on the notice board next to the automatic certificate issuing machine before each term begins. It can also be viewed on the JAIST website (Education → Taking Courses → Class Schedule).

"I119 Statistics for Data Analytics" will be treated as "I119 Statistics for Data Analytics II" in Doctoral program of the Transdisciplinary Science Division.

## Class schedules for 2021-2022 （JAIST）

### Term 1-1：Class Term ( April 12 – June 3 ) 4th - 5th
### Examination Term ( June 4 – June 8 )

※ ◆ indicates that the course is offered in Master's program of the Transdisciplinary Science Division. □ indicats it's for Doctoral program.

| | 4<br>15:20－17:00 | 5<br>17:10－18:50 |
|---|---|---|
| Mon. | E211 Intermediate Technical Communication 1 (Holden)<br>J011 Introductory Technical Japanese 1 (TSUTSUI M)<br>J111 Basic Technical Japanese 1 (YAMAGUCHI MICHIYO)<br>G212 Writing and Presentation Skills (TSUJI) | G214E Diversity Studies (KAWANISHI･MOTOYAMA) |
| Tue. | E411 Advanced Technical Communication 1 (Holden)<br>J211 Intermediate Technical Japanese 1 (TSUTSUI M)<br>K126E Basics of Knowledge Science (FUJINAMI)<br>K238 Introduction to Experimental Philosophy (MIZUMOTO)◆<br>M231 Bioorganic Chemistry (FUJIMOTO･HOHSAKA)◆ | |
| Wed. | E211 Intermediate Technical Communication 1 (Holden)<br>J011 Introductory Technical Japanese 1 (TSUTSUI M)<br>J111 Basic Technical Japanese 1 (YAMAGUCHI MICHIYO)<br>G212 Writing and Presentation Skills (TSUJI) | G214E Diversity Studies (KAWANISHI･MOTOYAMA) |
| Thu. | E411 Advanced Technical Communication 1 (Holden)<br>J211 Intermediate Technical Japanese 1 (TSUTSUI M)<br>K238 Introduction to Experimental Philosophy (MIZUMOTO)◆<br>M231 Bioorganic Chemistry (FUJIMOTO･HOHSAKA)◆ | |
| Fri. | S101 Innovation Theory and Methodology for Social Competencies（KOHDA et al.）◆<br>S102 Innovation Theory and Methodology for Creativity（KOHDA et al.）◆<br>* S102 will follow when S101 ends after 7 class meetings.<br>S503 Innovation Theory and Methodology for Total Capability Development（KOHDA et al.）□ | S101 Innovation Theory and Methodology for Social Competencies（KOHDA et al.）◆<br>S102 Innovation Theory and Methodology for Creativity（KOHDA et al.）◆<br>* S102 will follow when S101 ends after 7 class meetings.<br>S503 Innovation Theory and Methodology for Total Capability Development（KOHDA et al.）□ |

## Class schedules for 2021-2022（JAIST）

**Term 1-2：Class Term ( June 11 – August 2 ) 1st - 3rd**
**Examination Term ( August 3, August 4 )**

**NOTE:**
**Monday, July 19 follows the Thursday schedule**

※ ◆ indicates that the course is offered in Master's program of the Transdisciplinary Science Division. □ indicats it's for Doctoral program.

| | 1<br>9:00－10:40 | 2<br>10:50－12:30 | 3 |
|---|---|---|---|
| Mon. | K613E Social-Technical Complex Systems (Huynh)□<br>I217 Functional Programming (HIROKAWA)<br>I240E Cryptography (FUJISAKI E·Wang)<br>I439 Speech Signal Processing (AKAGI·Dang)<br>M211 Quantum Mechanics (MURATA)◆<br>M224 Inorganic Materials Chemistry (MAENOSONO)◆ | K114 Introduction to Social Research Methods (SATO N)<br>K495E Advances of Knowledge Science (FUJINAMI·HIGA·Xie)<br>I226 Computer Networks (TAN)<br>I438EJ Exercises on Graph Theory (KANEKO M)<br>M222 Computational Material Design (TANIIKE·Dam·MIYATA M)◆<br>M423 Functional Protein Device (HIRATSUKA)□ | Tutorial Hours ( 13:30 – 15:10 ) |
| Tue. | K214 Methodology for Knowledge Media (SATO T)◆<br>K412 Anthropology of Knowledge (ITO·HIGA)□<br>I121E Algebra for Computer Scientist (OGAWA)◆<br>I219 Software Design Methodology (AOKI·ISHII·KAWAI)◆<br>I419 Image Information Science (YOSHITAKA)◆<br>M262 Biomaterial Sensing (TAKAMURA YUZURU)◆<br>M274 Mechanics of Materials (Ji) | K236EJ Basis of Data Analytics (Dam·GOKON·Nguyen N)◆<br>K473 Management of Innovation (UCHIHIRA)◆<br>I116 Fundamentals of Programming (HIROKAWA)◆<br>I213 Discrete Signal Processing (ASANO)◆<br>I223E Natural Language Processing (Nguyen L)◆<br>M243 Solid State Physics I (TAKAMURA YUKIKO)◆<br>M254 Polymer Chemistry I (KANEKO T·OKEYOSHI)◆ | |
| Wed. | K121 Introduction to Cognitive Science (TORII・HIDAKA)◆<br>I239 Machine Learning (OKADA S·HASEGAWA)<br>I441 Advanced Computer Networks (SHINODA)□<br>I657E Quantum/Materials informatics (MAEZONO·HONGO·NAKANO)<br>M225 Instrumental Analytical Chemistry (SHINOHARA)◆ | K613E Social-Technical Complex Systems (Huynh)□<br>I217 Functional Programming (HIROKAWA)<br>I240E Cryptography (FUJISAKI E·Wang)<br>I439 Speech Signal Processing (AKAGI·Dang)<br>M211 Quantum Mechanics (MURATA)◆<br>M224 Inorganic Materials Chemistry (MAENOSONO)◆ | |
| Thu. | K236EJ Basis of Data Analytics (Dam·GOKON·Nguyen N)◆<br>K473 Management of Innovation (UCHIHIRA)◆<br>I116 Fundamentals of Programming (HIROKAWA)◆<br>I213 Discrete Signal Processing (ASANO)◆<br>I223E Natural Language Processing (Nguyen L)◆<br>M243 Solid State Physics I (TAKAMURA YUKIKO)◆<br>M254 Polymer Chemistry I (KANEKO T·OKEYOSHI)◆ | K214 Methodology for Knowledge Media (SATO T)◆<br>K412 Anthropology of Knowledge (ITO·HIGA)□<br>I121E Algebra for Computer Scientist (OGAWA)◆<br>I219 Software Design Methodology (AOKI·ISHII·KAWAI)◆<br>I419 Image Information Science (YOSHITAKA)◆<br>M262 Biomaterial Sensing (TAKAMURA YUZURU)◆<br>M274 Mechanics of Materials (Ji) | |
| Fri. | K114 Introduction to Social Research Methods (SATO N)<br>I226 Computer Networks (TAN)<br>I438EJ Exercises on Graph Theory (KANEKO M)<br>M222 Computational Material Design (TANIIKE·Dam·MIYATA M)◆<br>M423 Functional Protein Device (HIRATSUKA)□ | K121 Introduction to Cognitive Science (TORII・HIDAKA)◆<br>I239 Machine Learning (OKADA S·HASEGAWA)<br>I441 Advanced Computer Networks (SHINODA)□<br>I657E Quantum/Materials informatics (MAEZONO·HONGO·NAKANO)<br>M225 Instrumental Analytical Chemistry (SHINOHARA)◆ | |

**Irregular class schedule:**

I465S Literacy in Information Security Management (FUJISAKI E・Wang et al.)
Dates to be announced

M618E Materials Design (MATSUMURA·MIYAKO·Rajan·Misra)□
Dates to be announced

M432E Evaluation of Functions of Materials (EBITANI·IWAMOTO)
Dates to be announced

**NOTE:**
The class schedule of the courses with the assigned lecture rooms will be posted on the notice board next to the automatic certificate issuing machine before each term begins. It can also be viewed on the JAIST website (Education → Taking Courses → Class Schedule).

## Class schedules for 2021-2022（JAIST）

**Term 1-2：Class Term ( June 11 – August 2 ) 4th - 5th**
**Examination Term ( August 3, August 4 )**

**NOTE:**
**Monday, July 19 follows the Thursday schedule**

※ ◆ indicates that the course is offered in Master's program of the Transdisciplinary Science Division. □ indicats it's for Doctoral program.

| | 4<br>15:20－17:00 | 5<br>17:10－18:50 |
|---|---|---|
| Mon. | E211 Intermediate Technical Communication 1 (Holden)<br><br>J012 Introductory Technical Japanese 2 (TSUTSUI M)<br>J112 Basic Technical Japanese 2 (YAMAGUCHI MICHIYO) | G211E Global Communication for Collaboration Building (KAWANISHI･MOTOYAMA) |
| Tue. | E411 Advanced Technical Communication 1 (Holden)<br><br>J212 Intermediate Technical Japanese 2 (TSUTSUI M)<br>J413 Advanced Japanese Expressions (HONDA)<br><br>M232 Biophysics and Biophysical Chemistry (HAMADA)◆ | |
| Wed. | E211 Intermediate Technical Communication 1 (Holden)<br><br>J012 Introductory Technical Japanese 2 (TSUTSUI M)<br>J112 Basic Technical Japanese 2 (YAMAGUCHI MICHIYO) | G211E Global Communication for Collaboration Building (KAWANISHI･MOTOYAMA) |
| Thu. | E411 Advanced Technical Communication 1 (Holden)<br><br>J212 Intermediate Technical Japanese 2 (TSUTSUI M)<br>J413 Advanced Japanese Expressions (HONDA)<br><br>M232 Biophysics and Biophysical Chemistry (HAMADA)◆ | |
| Fri. | | |

## Class schedules for 2021-2022（JAIST）

### Term 2-1：Class Term ( October 12 – December 1 ) 1st - 3rd

### Examination Term ( December 2 – December 6 )

※ ◆ indicates that the course is offered in Master's program of the Transdisciplinary Science Division. □ indicats it's for Doctoral program.

| | 1<br>9:00－10:40 | 2<br>10:50－12:30 | 3 |
|---|---|---|---|
| Mon. | K111E Introduction to Management (Zelaya)<br><br>I232 Information Theory (FUJISAKI H)<br>I413E Theoretical Computer Science (HIROKAWA･YOKOYAMA･OGAWA)<br>I448 Distance Learning System (HASEGAWA･OTA)□<br><br>M211 Quantum Mechanics (OSHIMA)◆<br>M413E Functional Nanomaterials (MAENOSONO･NAGAO･YAMAMOTO Y･NISHIMURA)□ | K228E Introduction to Knowledge Science (Dam･HASHIMOTO･Huynh)<br><br>I217E Functional Programming (HIROKAWA)<br>I437E Coding Theory (Kurkoski)<br>I481 Software Development Laboratory for Highly Dependable Embedded Systems (SUZUKI M)<br><br>M421 Electronics (SUZUKI T)□ | Tutorial Hours ( 13:30－15:10 ) |
| Tue. | K417EJ Data Analytics (Dam･GOKON)◆<br><br>I225 Statistical Signal Processing (HONGO)◆<br>I233E Operating Systems (SHINODA･UDA)◆<br>I237E Formal Languages and Automata (OGAWA)◆<br><br>M261 Functional Biomolecules (TSUTSUI H)◆<br>M425E Analytical Mechanics (Ho)□ | K213 Methodology for Systems Science (To be announced)<br><br>I111E Algorithms and Data Structures (Schwartzman･Viglietta)◆<br>I211 Mathematical Logic (YOKOYAMA･OGAWA)◆<br>I212E Analysis for Information Science (Dang)◆<br>I223 Natural Language Processing (SHIRAI)◆<br><br>M223 Properties of Organic Materials (NAGAO･MATSUMI)◆<br>M245 Mathematics for Condensed Matter Science and Technology (An)◆<br>M623E Intelligent Robotic Systems (Ji･Ho･MIYAKO) | |
| Wed. | K611E Next-Generation Management of Technology (KOHDA･Javed)<br><br>I226E Computer Networks (Lim)<br>I240 Cryptography (FUJISAKI E･Wang)<br>I427 System Control Theory (ASASNO)<br><br>M111E Introduction to Physics (MIZUTANI)◆<br>M424 Polymer Chemistry II (YAMAGUCHI M･MATSUMURA)□<br>M614E Advanced Device Physics (OHDAIRA･TOKUMITSU)□ | K111E Introduction to Management (Zelaya)<br><br>I232 Information Theory (FUJISAKI H)<br>I413E Theoretical Computer Science (HIROKAWA･YOKOYAMA･OGAWA)<br>I448 Distance Learning System (HASEGAWA･OTA)□<br><br>M211 Quantum Mechanics (OSHIMA)◆<br>M413E Functional Nanomaterials (MAENOSONO･NAGAO･YAMAMOTO Y･NISHIMURA)□ | |
| Thu. | K213 Methodology for Systems Science (To be announced)<br><br>I111E Algorithms and Data Structures (Schwartzman･Viglietta)◆<br>I211 Mathematical Logic (YOKOYAMA･OGAWA)◆<br>I212E Analysis for Information Science (Dang)◆<br>I223 Natural Language Processing (SHIRAI)◆<br><br>M223 Properties of Organic Materials (NAGAO･MATSUMI)◆<br>M245 Mathematics for Condensed Matter Science and Technology (An)◆<br>M623E Intelligent Robotic Systems (Ji･Ho･MIYAKO) | K417EJ Data Analytics (Dam･GOKON)◆<br><br>I225 Statistical Signal Processing (HONGO)◆<br>I233E Operating Systems (SHINODA･UDA)◆<br>I237E Formal Languages and Automata (OGAWA)◆<br><br>M261 Functional Biomolecules (TSUTSUI H)◆<br>M425E Analytical Mechanics (Ho)□ | |
| Fri. | K228E Introduction to Knowledge Science (Dam･HASHIMOTO･Huynh)<br><br>I217E Functional Programming (HIROKAWA)<br>I437E Coding Theory (Kurkoski)<br>I481 Software Development Laboratory for Highly Dependable Embedded Systems (SUZUKI M)<br><br>M421 Electronics (SUZUKI T)□ | K611E Next-Generation Management of Technology (KOHDA･Javed)<br><br>I226E Computer Networks (Lim)<br>I240 Cryptography (FUJISAKI E･Wang)<br>I427 System Control Theory (ASASNO)<br><br>M111E ◆<br>M424 Polymer Chemistry II (YAMAGUCHI M･MATSUMURA)□<br>M614E Advanced Device Physics (OHDAIRA･TOKUMITSU)□ | |

**Irregular class schedule:**

I465S Literacy in Information Security Management (FUJISAKI E･Wang et al.)
Dates to be announced

I466 Introduction to International Standardization (ONISHI Y et al.)
5th period of every Friday in Terms 2-1 and 2-2

I466S Advanced Information Security Theory and Application (MIYAJI･TAKANO)
6:00 p.m. - 7:40 p.m. of every Wednesday in Terms 2-1 and 2-2

M616E Advanced Biomaterials (HIRATSUKA･TSUTSUI H･HAMADA･NAGAI K)□
Dates to be announced

**NOTE:**

The class schedule of the courses with the assigned lecture rooms will be posted on the notice board next to the automatic certificate issuing machine before each term begins. It can also be viewed on the JAIST website (Education → Taking Courses → Class Schedule).

## Class schedules for 2021-2022（JAIST）

### Term 2-1：Class Term ( October 12 – December 1 ) 4th - 5th

### Examination Term ( December 2 – December 6 )

※ ◆ indicates that the course is offered in Master's program of the Transdisciplinary Science Division. □ indicats it's for Doctoral program.

| | 4<br>15:20－17:00 | 5<br>17:10－18:50 |
|---|---|---|
| Mon. | E211 Intermediate Technical Communication 1 (Holden)<br>J011 Introductory Technical Japanese 1 (TSUTSUI M)<br>J111 Basic Technical Japanese 1 (YAMAGUCHI MICHIYO)<br>G212 Writing and Presentation Skills (TSUJI)<br>N001 Fabrication of Nano-Devices with Training Course (AKABORI･SUZUKI T) | G214E Diversity Studies (KAWANISHI･MOTOYAMA)<br>N001 Fabrication of Nano-Devices with Training Course (AKABORI･SUZUKI T) |
| Tue. | E411 Advanced Technical Communication 1 (Holden)<br>J211 Intermediate Technical Japanese 1 (TSUTSUI M)<br>K126 Basics of Knowledge Science (FUJINAMI)<br>M231 Bioorganic Chemistry (FUJIMOTO･HOHSAKA)◆<br>N002 Study on Nanobiotechnology with Training Course (HOHSAKA･WATANABE･TAKAMURA YUZURU･HIROSE) | N002 Study on Nanobiotechnology with Training Course (HOHSAKA･WATANABE･TAKAMURA YUZURU･HIROSE) |
| Wed. | E211 Intermediate Technical Communication 1 (Holden)<br>J011 Introductory Technical Japanese 1 (TSUTSUI M)<br>J111 Basic Technical Japanese 1 (YAMAGUCHI MICHIYO)<br>G212 Writing and Presentation Skills (TSUJI)<br>N003 Analysis of Nano-Materials with Training Course (OHKI･MATSUMURA･YAMAGUCHI T) | G214E Diversity Studies (KAWANISHI･MOTOYAMA)<br>N003 Analysis of Nano-Materials with Training Course (OHKI･MATSUMURA･YAMAGUCHI T) |
| Thu. | E411 Advanced Technical Communication 1 (Holden)<br>J211 Intermediate Technical Japanese 1 (TSUTSUI M)<br>M231 Bioorganic Chemistry (FUJIMOTO･HOHSAKA)◆<br>N004 Structural Analysis of Solids on Nano-Scale with Training Course (MAENOSONO･TOMITORI･TAKAHASHI) | N004 Structural Analysis of Solids on Nano-Scale with Training Course (MAENOSONO･TOMITORI･TAKAHASHI) |
| Fri. | S101 Innovation Theory and Methodology for Social Competencies（KOHDA et al.）◆<br>S102 Innovation Theory and Methodology for Creativity（KOHDA et al.）◆<br>* S102 will follow when S101 ends after 7 class meetings.<br>S503 Innovation Theory and Methodology for Total Capability Development（KOHDA et al.）□<br>N005 Material Analysis with Training Course (SHINOHARA･KANEKO T･YAMAMOTO Y･OKEYOSHI) | S101 Innovation Theory and Methodology for Social Competencies（KOHDA et al.）◆<br>S102 Innovation Theory and Methodology for Creativity （KOHDAet al.） ◆<br>* S102 will follow when S101 ends after 7 class meetings.<br>S503 Innovation Theory and Methodology for Total Capability Development（KOHDA et al.）□<br>I466 Introduction to International Standardization (ONISHI Y et al.)<br>N005 Material Analysis with Training Course (SHINOHARA･KANEKO T･YAMAMOTO Y･OKEYOSHI) |

## Class schedules for 2021-2022（JAIST）

**Term 2-2：Class Term ( December 8 – February 4 ) 1st - 3rd**
**Examination Term ( February 7, February 8 )**

**NOTE:**
**Thursday, January 6 follows the Tuesday schedule.**
**Friday, January 7 follows the Monday schedule.**
**Wednesday, January 12 follows the Monday schedule.**

※ ◆ indicates that the course is offered in Master's program of the Transdisciplinary Science Division. □ indicats it's for Doctoral program.

| | 1<br>9:00－10:40 | 2<br>10:50－12:30 | 3 |
|---|---|---|---|
| Mon. | | K213E Methodology for Systems Science (Huynh)<br>K411 Theory of Knowledge Management (FUJINAMI･SASAKI) | Tutorial Hours ( 13:30－15:10 ) |
| | I213E Discrete Signal Processing (Chong)◆<br>I450 Network Design Laboratory (Lim) | I239E Machine Learning (Nguyen L･Racharak)<br>I482 Software Process Design for Highly Dependable Embedded Systems (SUZUKI M･AOKI) | |
| | M282E New Materials Design and Synthesis (YAMAGUCHI M･YAMAMOTO Y･OKEYOSHI･Chammingkwan) | M281E Solid State Physics and its Application to Electronics I (MIZUTA･MURATA･An･Muruganathan) | |
| Tue. | K214E Methodology for Knowledge Media (KANAI)◆ | K114E Introduction to Social Research Methods (Javed)<br>K495E Advances of Knowledge Science (FUJINAMI･TAKASHIMA･SATO N･TORII) | |
| | I214E System Optimization (Kurkoski･KANEKO M)◆<br>I219E Software Design Methodology (AOKI･ISHII)◆<br>I238 Computation Theory (ISHIHARA)◆ | I235E Game Informatics (IKEDA K･Khalid･Hsueh)◆<br>I440 Enhanced Operating Systems (TANAKA) | |
| | M212 Statistical Mechanics (KOYANO)◆ | M420 Solid State Physics II (AKABORI)◆ | |
| Wed. | K411E Theory of Knowledge Management (Zelaya･Kim)<br>K414 Complex Systems Analysis (HASHIMOTO･KUROKAWA) | | |
| | I218E Software Design Methodology (INOGUCHI)◆<br>I628E Information Processing Theory (AKAGI･KANEKO M･Racharak･KIDANI･UDA･Javaid) | I213E Discrete Signal Processing (Chong)◆<br>I450 Network Design Laboratory (Lim) | |
| | M283E Biofunction and Organization (TAKAGI･TSUKAHARA･TAKAMURA YUZURU･OHKI･SHIMOKAWA) | M282E New Materials Design and Synthesis (YAMAGUCHI M･YAMAMOTO Y･OKEYOSHI･Chammingkwan) | |
| Thu. | K114E Introduction to Social Research Methods (Javed) | K214E Methodology for Knowledge Media (KANAI)◆ | |
| | I235E Game Informatics (IKEDA K･Khalid･Hsueh)◆<br>I440 Enhanced Operating Systems (TANAKA) | I214E System Optimization (Kurkoski･KANEKO M)◆<br>I219E Software Design Methodology (AOKI･ISHII)◆<br>I238 Computation Theory (ISHIHARA)◆ | |
| | M420 Solid State Physics II (AKABORI)◆ | M212 Statistical Mechanics (KOYANO)◆ | |
| Fri. | K213E Methodology for Systems Science (Huynh)<br>K411 Theory of Knowledge Management (FUJINAMI･SASAKI) | K411E Theory of Knowledge Management (Zelaya･Kim)<br>K414 Complex Systems Analysis (HASHIMOTO･KUROKAWA) | |
| | I239E Machine Learning (Nguyen L･Racharak)<br>I482 Software Process Design for Highly Dependable Embedded Systems (SUZUKI M･AOKI) | I218E Software Design Methodology (INOGUCHI)◆<br>I628E Information Processing Theory (AKAGI･KANEKO M･Racharak･KIDANI･UDA･Javaid) | |
| | M281E Solid State Physics and its Application to Electronics I (MIZUTA･MURATA･An･Muruganathan) | M283E Biofunction and Organization (TAKAGI･TSUKAHARA･TAKAMURA YUZURU･OHKI･SHIMOKAWA) | |

**Irregular class schedule:**

I466 Introduction to International Standardization (ONISHI Y et al.)
5th period of every Friday in Terms 2-1 and 2-2

I466S Advanced Information Security Theory and Application (MIYAJI･TAKANO)
6:00 p.m. - 7:40 p.m. of every Wednesday in Terms 2-1 and 2-2

M620E Electronic Properties of Condensed Matter (OSHIMA･KOYANO･An･Muruganathan)□
Dates to be announced

**NOTE:**
The class schedule of the courses with the assigned lecture rooms will be posted on the notice board next to the automatic certificate issuing machine before each term begins. It can also be viewed on the JAIST website (Education → Taking Courses → Class Schedule).

## Class schedules for 2021-2022（JAIST）

### Term 2-2：Class Term ( December 8 – February 4 ) 4th - 5th
### Examination Term ( February 7, February 8 )

**NOTE:**
**Thursday, January 6 follows the Tuesday schedule.**
**Friday, January 7 follows the Monday schedule.**
**Wednesday, January 12 follows the Monday schedule.**

※ ◆ indicates that the course is offered in Master's program of the Transdisciplinary Science Division. □ indicats it's for Doctoral program.

| | 4<br>15:20－17:00 | 5<br>17:10－18:50 |
|---|---|---|
| Mon. | E211 Intermediate Technical Communication 1 (Holden)<br><br>J012 Introductory Technical Japanese 2 (TSUTSUI M)<br>J112 Basic Technical Japanese 2 (YAMAGUCHI MICHIYO) | <br><br><br><br>G213E Japan Studies (KAWANISHI･MOTOYAMA) |
| Tue. | E411 Advanced Technical Communication 1 (Holden)<br><br>J212 Intermediate Technical Japanese 2 (TSUTSUI M)<br><br>M414 Device Physics (TOKUMITSU)◆<br>M415 Medical Biomaterials (TSUKAHARA)◆ | |
| Wed. | E211 Intermediate Technical Communication 1 (Holden)<br><br>J012 Introductory Technical Japanese 2 (TSUTSUI M)<br>J112 Basic Technical Japanese 2 (YAMAGUCHI MICHIYO) | <br><br><br>G213E Japan Studies (KAWANISHI･MOTOYAMA) |
| Thu. | E411 Advanced Technical Communication 1 (Holden)<br><br>J212 Intermediate Technical Japanese 2 (TSUTSUI M)<br><br>M414 Device Physics (TOKUMITSU)◆<br>M415 Medical Biomaterials (TSUKAHARA)◆ | |
| Fri. | | I466 Introduction to International Standardization (ONISHI Yet al.) |

## 4 Time Table of the Examination Term for 2021-2022 （JAIST）

**【Term1-1】** Examination shedule for the courses held at the following period is below.

| | 1st period 9:00-10:40 | 2nd period 10:50-12:30 | 3rd period 13:30-15:10 | 4th period 15:20-17:00 | 5th period 17:10-18:50 |
|---|---|---|---|---|---|
| June 4（Fri.） | The last class of S102 and S503. | | | | |
| June 7（Mon.） | Monday 1st period | Monday 2nd period | Wednesday 1st period | Monday 4th period | Monday 5th period |
| June 8（Tue.） | Tuesday 1st period | Tuesday 2nd period | | Tuesday 4th period | Tuesday 5th period |

**【Term1-2】** Examination shedule for the courses held at the following period is below.

| | 1st period 9:00-10:40 | 2nd period 10:50-12:30 | 3rd period 13:30-15:10 | 4th period 15:20-17:00 | 5th period 17:10-18:50 |
|---|---|---|---|---|---|
| August 3（Tue.） | Tuesday 1st period | Tuesday 2nd period | | Tuesday 4th period | Tuesday 5th period |
| August 4（Wed.） | Wednesday 1st period | Monday 1st period | Monday 2nd period | Monday 4th period | Monday 5th period |

**【Term2-1】** Examination shedule for the courses held at the following period is below.

| | 1st period 9:00-10:40 | 2nd period 10:50-12:30 | 3rd period 13:30-15:10 | 4th period 15:20-17:00 | 5th period 17:10-18:50 |
|---|---|---|---|---|---|
| December 2（Thu.） | Tuesday 2nd period | Tuesday 1st period | | Tuesday 4th period | Tuesday 5th period |
| December 3（Fri.） | The last class of S102 and S503. | | | | |
| December 6（Mon.） | Monday 1st period | Monday 2nd period | Wednesday 1st period | Monday 4th period | Monday 5th period |

**【Term2-2】** Examination shedule for the courses held at the following period is below.

| | 1st period 9:00-10:40 | 2nd period 10:50-12:30 | 3rd period 13:30-15:10 | 4th period 15:20-17:00 | 5th period 17:10-18:50 |
|---|---|---|---|---|---|
| February 7（Mon.） | Monday 1st period | Monday 2nd period | Wednesday 1st period | Monday 4th period | Monday 5th period |
| February 8（Tue.） | Tuesday 1st period | Tuesday 2nd period | | Tuesday 4th period | Tuesday 5th period |

# Courses and Class Schedules
# (Kanazawa University)

# Courses and Class Schedules (Kanazawa University)

## 1 Overview (Kanazawa University)

At Kanazawa University, each class is 90-minute long, and a class meets 15 times in one quarter with one class a week to complete a course bearing 2 credits. The examinations are held in the last week of each quarter.

Courses offered at Kanazawa University, in principle, should be taken at Kanazawa University. However, some courses may be offered remotely using a video conferencing system as required. More details about this matter will be announced separately.

### 1.1 Courses and class schedules

The tables in Section 2-1 below list the course titles and instructor's names in charge offered in the master's program of the Division of Transdisciplinary Sciences at Kanazawa University. In general, 1 credit will be granted for each Specialized course in master's program. Otherwise, the number of credits is indicated the "Note" row. The tables in Section 2-2 below list the Courses (course title, instructor, etc.) offered in the doctoral program of the Division of Transdisciplinary Sciences at Kanazawa University. 2 credits will be granted for each Specialized course in doctoral program, the exceptions are indicated in the "Note" row. The course term of each class will be announced separately.

Check the syllabi for details about each course.

The course titles and class schedules will be published on the KU website (Kanazawa University Graduate School of Frontier Science Initiative → For Student → Division of Transdisciplinary Sciences → Class Schedule).

## 2－1 Master's Program Courses for 2021-2022 (Kanazawa University)

### ○ Core Courses

| Course Number | Course Title | Instructor(s) | Note |
|---|---|---|---|
| 15001 | Introduction to Entrepreneurship | KITAGAWA et al. | 1 credit, Required elective course |
| 15002 | Entrepreneurial Core Technology and Strategy | KIWATA et al. | 1 credit, Required elective course |
| 15003 | Research Ethics | KAKIUCHI | 1 credit, Required elective course |
| 15005 | Introduction to Practical Data Analysis and Statistics a | SAGAE | 1 credit, Required elective course |
| 15006 | Introduction to Practical Data Analysis and Statistics b | MIZUNO et al. | 1 credit, Required elective course |

### ○ Transdisciplinary Experience Courses

| Course Number | Course Title | Instructor(s) | Note |
|---|---|---|---|
| T002 | Transdisciplinary Laboratory Rotation Ia (KU) | Faculties, et al. at Division of Transdisciplinary Sciences (KU) | 1 credit, Required elective course |
| T003 | Transdisciplinary Laboratory Rotation Ib (KU) | | 1 credit, Required elective course |

### ○ Specialized Courses

#### ・Common Subjects

| Course Number | Course Title | Instructor(s) | Note |
|---|---|---|---|
| 15308 | Distributed parallel real-time systems a | YAMANE | |
| 15309 | Distributed parallel real-time systems b | YAMANE | |
| 15310 | Data Mining a | NAMBO | |
| 15311 | Data Mining b | NAMBO | |
| 15303 | Bioinformatics and Recent Advances in Biology | SATOU K | 2 credits, Required elective course |
| 15312 | Information Processing in Video Systems a | IMAMURA | |
| 15313 | Information Processing in Video Systems b | IMAMURA | |

| Course Number | Course Title | Instructor(s) | Note |
|---|---|---|---|
| 15316 | Array Signal Processing a | MIYOSHI | |
| 15317 | Array Signal Processing b | MIYOSHI | |
| 15318 | Advanced Communication Engineering a | KASAHARA | |
| 15319 | Advanced Communication Engineering b | KASAHARA | |
| 15320 | Fundamentals of Nanoscale Measurements and Control A | FUKUMA | |
| 15321 | Fundamentals of Nanoscale Measurements and Control B | TAKAHASHI | |

**・Life Science Subjects**

| Course Number | Course Title | Instructor(s) | Note |
|---|---|---|---|
| 15412 | Bioscience of Cancer Ia | OSHIMA et al. | |
| 15413 | Bioscience of Cancer Ib | OSHIMA et al. | |
| 15414 | Bioscience of Cancer IIa | HIRAO et al. | |
| 15415 | Bioscience of Cancer IIb | HIRAO et al. | |
| 15416 | Introduction to Dynamics of Biomolecules a | KODERA et al. | |
| 15417 | Introduction to Dynamics of Biomolecules b | KODERA et al. | |
| 15418 | Introduction to Molecular and Biophysics a | FUJITAKE et al. | |
| 15419 | Introduction to Molecular and Biophysics b | FUJITAKE et al. | |
| 15420 | Management of opportunistic infection affecting tissue viability of human skin and mucosa of oral cavity or pharynx a | SUGAMA et al. | |
| 15421 | Management of opportunistic infection affecting tissue viability of human skin and mucosa of oral cavity or pharynx b | SUGAMA et al. | |
| 15422 | Introduction to Discovering Molecular Probes a | OGAWA et al. | |
| 15423 | Introduction to Discovering Molecular Probes b | KUNISHIMA et al. | |
| 15424 | Human Body: Structures a | HORI et al. | |

| Course Number | Course Title | Instructor(s) | Note |
|---|---|---|---|
| 15425 | Human Body: Structures b | HORI et al. | |
| 15408 | Human Body: Functions | MIEDA et al. | 2 credits, Required elective course |
| 15409 | Human Body: Diseases | HARADA et al. | 2 credits, Required elective course |
| 15426 | Advanced Course of Organic Chemistry | GOTO K et al. | |

## ・Materials Science Subjects

| Course Number | Course Title | Instructor(s) | Note |
|---|---|---|---|
| 15514 | Lightwave Engineering a | IIYAMA | |
| 15515 | Lightwave Engineering b | MARUYAMA | |
| 15504 | Introduction of Energy and Environmental Program | ASAKAWA et al. | |
| 15505 | Introduction of Material Program | YAMAGISHI et al. | |
| 15506 | Advanced study of solar cell technology I | TAIMA et al. | 2 credits, Required elective course |
| 15516 | Advanced solid state physical chemistry Ia | MIZUNO | |
| 15517 | Advanced solid state physical chemistry Ib | MIZUNO | |
| 15508 | Synthetic Chemistry of Polymeric Materials | MAEDA et al. | 2 credits, Required elective course |
| 15509 | Functional Polymer Materials | YAMAGISHI et al. | 2 credits, Required elective course |
| 15518 | Advanced bio-refinery engineering Ia | NINOMIYA et al. | |
| 15519 | Advanced bio-refinery engineering Ib | NINOMIYA et al. | |
| 15520 | Advanced Surface and Interface Engineering Ia | TOKUDA | |
| 15521 | Advanced Surface and Interface Engineering Ib | TOKUDA | |
| 15522 | Devices Process Engineering a | KAWAE | |
| 15523 | Devices Process Engineering b | KAWAE | |

| Course Number | Course Title | Instructor(s) | Note |
|---|---|---|---|
| 15524 | Fundamentals of Materials Characterization a | MORIMOTO | |
| 15525 | Fundamentals of Materials Characterization b | INOKUMA | |

### ･Social Systems Science Subjects

| Course Number | Course Title | Instructor(s) | Note |
|---|---|---|---|
| 15608 | Science in Archaeology a | KAWAI et al. | |
| 15609 | Science in Archaeology b | KAWAI et al. | |
| 15610 | Elementary Theories of Transdisciplinary Science on Cognition and Behavior a | KOJIMA | |
| 15611 | Elementary Theories of Transdisciplinary Science on Cognition and Behavior b | KOJIMA | |
| 15612 | Introduction to comparative cognition a | TANIUCHI | |
| 15613 | Introduction to comparative cognition b | TANIUCHI | |
| 15614 | Introduction of Exercise Physiology a | MASUDA | |
| 15615 | Introduction of Exercise Physiology b | MASUDA | |
| 15616 | Special Lecture on Civilization Studies a | NAKAMURA S | |
| 15617 | Special Lecture on Civilization Studies b | NAKAMURA S | |
| 15618 | Clinical Neuropsychology Ia | MATSUI | |
| 15619 | Clinical Neuropsychology Ib | MATSUI | |
| 15620 | Introduction to Cultural Resource Studies a | MORI et al. | |
| 15621 | Introduction to Cultural Resource Studies b | MORI et al. | |
| 15622 | Intelligent Mobile Robot Ia | SEKI et al. | |
| 15623 | Intelligent Mobile Robot Ib | SUGANUMA et al. | |
| 15624 | Biomechanical Engineering Ia | SAKAMOTO | |

| Course Number | Course Title | Instructor(s) | Note |
|---|---|---|---|
| 15625 | Biomechanical Engineering Ib | SAKAMOTO | |
| 15626 | History of Technology and Society | TANIGAWA | |
| 15627 | Computer Vision A | YONEDA | |
| 15628 | Computer Vision B | YONEDA | |

## ○ Research Support Courses

| Course Number | Course Title | Instructor(s) | Note |
|---|---|---|---|
| T007 | Seminar and Exercise I (KU) | Second supervisor | 2 credits, Required course |

## ２－２　Doctor's Program Courses for 2021-2022 (Kanazawa University)

### ○ Transdisciplinary Experience Courses

| Course Number | Course Title | Instructor(s) | Note |
|---|---|---|---|
| T052 | Transdisciplinary Laboratory Rotation Ⅱ (KU) | Faculties, et al. at Division of Transdisciplinary Sciences (KU) | 1 credit, Required course |

### ○ Specialized Courses

#### ・Common Subjects

| Course Number | Course Title | Instructor(s) | Note |
|---|---|---|---|
| 17301 | Fostering the independence of researchers | IIYAMA | 1 credit, Required elective course |
| 17302 | Introduction to Practical Data Analysis and Statistics | SAGAE et al. | |
| 17303 | Advanced Data Mining | NAMBO | |
| 17304 | Advanced Bioinformatics | SATOU K | |
| 17305 | Management Science | SAGAE | |

Note:17302 is storongly recommended to the students who have never studied statistics etc. before.
However, its credits can not be counted for degree completion requirements.

#### ・Life Science Subjects

| Course Number | Course Title | Instructor(s) | Note |
|---|---|---|---|
| 17401 | Integrated Life Sciences | SUZUKI T et al. | |
| 17402 | Structure and dynamics of biological molecules | SHIBATA | |
| 17403 | Nanobiology | KODERA | |
| 17404 | Molecular and Cellular Biology | Wong et al. | |
| 17405 | Molecular Microbiology | TAOKA | |
| 17406 | Chronic Care/Wound Management: Lecture | SUGAMA et al. | |

## ・Materials Science Subjects

| Course Number | Course Title | Instructor(s) | Note |
|---|---|---|---|
| 17501 | Advanced study of solar cell technology II | TAIMA | |
| 17502 | Advanced solid state physical chemistry II | MIZUNO | |
| 17503 | Polymer and Material Chemistry | NISHIMURA | |
| 17504 | Advanced bio-refinery engineering II | NINOMIYA et al. | |
| 17505 | Advanced Surface and Interface Engineering II | TOKUDA | |
| 17506 | Oxide Device Processing | KAWAE | |
| 17507 | Oxide Electronics | MORIMOTO | |
| 17508 | Thin Film Electronics | INOKUMA | |

## ・Social Systems Science Subjects

| Course Number | Course Title | Instructor(s) | Note |
|---|---|---|---|
| 17601 | Intelligent Mobile Robot II | SUGANUMA | |
| 17602 | Biomechanical Engineering II | SAKAMOTO | |
| 17603 | Measurement systems | IIYAMA | |
| 17604 | Digital Video Processing | IMAMURA | |
| 17606 | Verification of Distributed, Parallel and Real-Time Systems | YAMANE | |
| 17607 | Theories of Transdisciplinary Science on Cognition and Behavior I | KOJIMA | |
| 17608 | Theories of Transdisciplinary Science on Cognition and Behavior II | KOJIMA | |
| 17609 | Advanced Exercise Physiology | MASUDA | |
| 17610 | Psychology of Learning and Behavior | TANIUCHI | |
| 17611 | Interdisciplinary Studies in Archaeology and Cultural Heritage Studies I | KAWAI | |

| Course Number | Course Title | Instructor(s) | Note |
|---|---|---|---|
| 17612 | Interdisciplinary Studies in Archaeology and Cultural Heritage Studies Ⅱ | KAWAI | |
| 17613 | Comparative Prehistory | NAKAMURA S | |
| 17614 | Optical Sensing | IIYAMA | |
| 17615 | Modern Neural Computation | YONEDA | |

## ○ Research Support Courses

| Course Number | Course Title | Instructor(s) | Note |
|---|---|---|---|
| T058 | Seminar and Exercise Ⅱ (KU) | Second supervisor | 4 credits, Required course |

Contact:
Educational Service Section
Educational Affairs Department
Japan Advanced Institute of Science and Technology
1-1 Asahidai, Nomi, Ishikawa 923-1292
Email: kyoumu@ml.jaist.ac.jp
TEL: 0761-51-1936

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