Special Bacical Lecture of Energy Engineering (2.0credits) (エネルギー理工学基礎特論)

Course Type	Basic Courses
Division at course	Master's Course
Class Format	Lecture
Course Name	Department of Energy Engineering
Starts 1	1 Spring Semester
Lecturer	Associated Faculty

●Course Purpose

Study the foundamental technique and the advanced technology in enery system.

●Prerequisite Subjects

●Course Topics

Each member of Department of Energy Engineering will give a lecture on base and recent technology related to his/her research field.

●Textbook

●Additional Reading

●Grade Assessment

●Notes

No special prerequisite for taking this class.

●Contacting Faculty

Energy Engineering Seminar 1A (2.0credits) (エネルギー理工学セミナー1A)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Department of Energy Engineering		
Starts 1	1 Spring Semester		
Lecturer	Takanori NAGASAKI Professor	TomoakiYAMADA Associate Professor	Junji YUHARA Associate Professor
	Masahito YOSHINO Assistant Professor		

●Course Purpose

This seminar deals with various topics in solid state physics, solid state chemistry and materials science. Using a standard textbook written in English, the students give lectures in turn and discuss each other about the contents. They are expected to deepen the understanding of the topics by presentation and discussion during the seminar. They are also expected to improve the skills of reading scientific and technical English.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Energy Engineering Seminar 1A (2.0credits) (エネルギー理工学セミナー1A)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	1 Spring Semester	
Lecturer	Jun ONOE Professor	Masato NAKAYA Associate Professor

●Course Purpose

This course is a weekly seminar that presents the progress of master's thesis research using slides and then discusses the content to develop deeper insight into the research content and acquire the research “Iroha” It is an object.The achievement goal can explain the position of my research theme.

●Prerequisite Subjects

Energy nanomaterials scienceQuantum materials sciencesolid-state physics

●Course Topics

We will discuss about next topics. (1) Structure, functionality, and properties of nanomaterials (nanocarbons, Metal?organic frameworks, nanoparticles, and functional thin films) (2) Development of methodologies and apparatus of Advased multiscale measurement of nanomaterials (3) Novel methodologies toward control of functionality of nanomaterials (4) Application of nanomaterials

●Textbook

Review papers and research papers will be provided.

●Additional Reading

●Grade Assessment

Comprehensive evaluation by attendance, presentation of seminars and questions and answers, questions on presentations of other students, etc.

●Notes

●Contacting Faculty

Respond during seminar time.

Energy Engineering Seminar 1A (2.0credits) (エネルギー理工学セミナー1A)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	1 Spring Semester	
Lecturer	Ayae Narutaki Professor	Rintaro TAKAHASHI Assistant Professor

●Course Purpose

The goal of this course for students is to acquire the following knowledge and abilities regarding soft materials at the end of class.

(1) To be able to understand and explain the contents of cutting-edge academic papers.
(2) To be able to understand the background of the research that the students are working on and explain the significance of the research.
(3) To improve the problem-solving ability to optimally conduct the research that the students are working on.

●Prerequisite Subjects

Basic Chemistry, Physical Chemistry, Energy Materials Science, Condensed Matter Physics, Quantum Material Chemistry, Electromagnetism

●Course Topics

Based on a literature survey on the following contents, students will present and discuss the contents of cutting-edge academic papers or the contents of students' research at seminars.

(1) Synthesis, structure, function, and physical properties of soft materials (polymers, colloids, molecular assemblies, gels, etc.)
(2) Analytical method for clarifying the structure, physical properties, and functions of soft materials
(3) Methodology for designing the physical properties and functions of soft materials
(4) Application of soft materials to the energy field

●Textbook

Review articles and the latest research articles are introduced from time to time.

●Additional Reading

Ulf Wiel Gedde, Mikael S. Hedenqvist, Fundamental Polymer Science, Springer.

●Grade Assessment

The lecturers will comprehensively judge the content of presentations, questions and answers, and discussions of the students at the seminar. Based on the goals stated in "Course Purpose", if improvement of ability is recognized, students will be passed, and if more advanced ability is acquired, it will be reflected in the grade accordingly.

●Notes

There are no special registration requirements.
As a general rule, classes will be conducted by distance learning using ICT.

●Contacting Faculty

The lecturers accept questions at any time.

Energy Engineering Seminar 1A (2.0credits) (エネルギー理工学セミナー1A)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	1 Spring Semester	
Lecturer	Shinya YAGI Professor	Satoshi OGAWA Assistant Professor

●Course Purpose

The aim of this seminar is to understand the basic technical contents about the energy materials, environmental materials, X-ray spectroscopic measurement, and photoelectron spectroscopy measurement methods and physics through the lecture and discussion.

●Prerequisite Subjects

condensed matter theory, electronic structure in materials, quantum mechanics, electromagnetics theory, quantum chemistry, X-ray spectroscopy, instrument of synchrotron radiation

●Course Topics

In this seminar, the following contents will be covered in order to understand basic knowledge about surfaces and bulk, and to promote understanding of the principles, analysis and interpretation of analytical methods to clarify material's structures and chemical bonding states.1: Surface and bulk2: Chemical bonding state3: Nano materials and environmental functional materials4: X-ray spectroscopy, photoelectron spectroscopy5: Various devices for synchrotron radiation facility

●Textbook

"Introduction to Solid State Physics", Kittel, Willy

●Additional Reading

Distribute necessary prints

●Grade Assessment

attendance and implementation of a problem

●Notes

nothing

●Contacting Faculty

e-mail: yagi.shinya@c.mbox.nagoya-u.ac.jpPhone: 052-747-6828

Energy Engineering Seminar 1A (2.0credits) (エネルギー理工学セミナー1A)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Seminar
Course Name	Department of Energy Engineering
Starts 1	1 Spring Semester
Lecturer	Hideki TOMITA Associate Professor

●Course Purpose
Deep understanding of basic theory and application technique on quantum beam measurement by reading,lecturing and discussing some typical textbooks and/or reference review papers on this field

●Prerequisite Subjects
Electromagnetism, Quantum Mechanics, Atomic Physics, Material Science, Fundamentals of Nuclear Radiation Measurement

●Course Topics
Physics and techniques on hardware/software systems for quantum beam measurement are studied through each student lecturing a part of reference books and papers with some original exercise in turn.

●Textbook
Radiation Detection and Measurement, 4th ed. ,G.F.Knoll,John Wiley and Sons, 2010, or related scientfic journal papers.

●Additional Reading
Academic journals related to Research and Development of quantum beam measurement, such as IEEE Trans. Nucl. Sci., Nucl. Instrum. Meth., Rev. Sci.Instrum, etc.

●Grade Assessment
Oral Examinations

Grade point:
Pass mark is more than 60 points for full marks of 100 points.

(For students of Year 2020 entrance and later)
100-95:A+, 94-80:A, 79-70:B, 69-65:C, 64-60:C-, <59:F
(For students of Year 2019 entrance and earlier)
100-90:S, 89-80:A, 79-70:B, 69-60:C, <59:F

●Notes
None

Please contact the lecturer of the course.

●Contacting Faculty
The questions will be answered by e-mail.

Address: h-tomita(at)energy.nagoya-u.ac.jp
(Please replace (at) with @.)

Energy Engineering Seminar 1A (2.0credits) (エネルギー理工学セミナー1A)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	1 Spring Semester	
Lecturer	Michihiro SHIBATA Professor	Yasuaki KOJIMA Associate Professor

●Course Purpose

Reading by turns releases necessary textbook and document to learn the experimental technique needed for explication of radiation measurements and the nuclear structure. Understand about a research trend of the related field. Put on basic skills and application ability through these. Specifically, The aims are following.1. The elucidation technique of the nuclear structure by the radiation measurement can be understood and explained.2. Know a document of nuclear data and a web site necessary to an experiment and utilize appropriately.3. Understand the thesis with the basic nuclear structure and radiation measurement, explain the contents.

●Prerequisite Subjects

Nuclear physics, Quantum mechanics, Radiation measurements

●Course Topics

1. Structure of atomic nuclei1-1. liquid drop model and shell model1-2. collective model and unified model2. Nuclear reaction2-1. Compound nuclei 2-2. Resonance3. Accelerator4. Radiation sources and radioisotope production 5. Radiation measurements and nuclear structure6. Utilization of Nuclear Data libraryShare a technical book or material about the above contents, translate the person in charge into Japanese beforehand, and show translations as well as explain the contents together at the session. Anyone but the person in charge understand the language.

●Textbook

introduce the textbooks in the beginning of the fiscal year

●Additional Reading

introduce books and thesis according to the progress.

●Grade Assessment

Goal attainment level is estimated by the degree of the oral announcement in a seminar, the question and answer to that and the participation in argument. The degree of the preparation and the degree of participation to the oral announcement, the question and answer and the argument are set to 50%, 30% and 20% respectively.

●Notes

No registration conditions required

●Contacting Faculty

in class or officeProf. SHIBATA, Michihiro ex.2569e-mail:i45329a@nucc.cc.nagoya-u.ac.jpAssoc. Prof. KOJIMA, Yasuakiex.2572e-mailkojima.yasuaki@f.mbox.nagoya-u.ac.jp

Energy Engineering Seminar 1A (2.0credits) (エネルギー理工学セミナー1A)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Seminar
Course Name	Department of Energy Engineering
Starts 1	1 Spring Semester
Lecturer	Yoshiyuki TSUJI Professor

●Course Purpose

Learn the foundamental aspect of energy system.

●Prerequisite Subjects

●Course Topics

●Textbook

S.B.Pope, Turbulent Flow, Cambridge Univ. PressP.A.Davidson, Turbulence, Oxford Univ. Press Other references are served by hard copies.

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Energy Engineering Seminar 1A (2.0credits) (エネルギー理工学セミナー1A)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Department of Energy Engineering		
Starts 1	1 Spring Semester		
Lecturer	Kiyomasa WATANABE Professor	Eiji IKENAGA Associate Professor	Tatsuya Assistant Professor

●Course Purpose

Deep understanding of fundamental plasma science and engineering by referring the textbook on the following topics: Plasma particle and heat transport, MHD stability of magnetized plasmas, edge plasma phenomena, plasma heating.Through the above methods, the student's skill of the presentation will be improved.Purpose1. Understand the basic characteristics of the magnetized plasmas.2. Understand the contents of the English text book on the basic characteristics of the magnetized plasmas.3. Summarize the contents of the textbook and explain them to the other persons.

●Prerequisite Subjects

Electromagnetics, Mechanics, physical mathematics, Related Fundamental Physics

●Course Topics

Read an English textbook in Journal club type class1) Definition of plasma 2) Single particle motion in magnetic field 3) Velocity distribution function 4)Plasma particle collision processes 5) Particle and heat transport of plasma in various magnetic field configuration

●Textbook

●Additional Reading

●Grade Assessment

oral examination and discussion

●Notes

There is no certificate to take this course.

●Contacting Faculty

Energy Engineering Seminar 1B (2.0credits) (エネルギー理工学セミナー1B)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Department of Energy Engineering		
Starts 1	1 Autumn Semester		
Lecturer	Takanori NAGASAKI Professor	TomoakiYAMADA Associate Professor	Junji YUHARA Associate Professor
	Masahito YOSHINO Assistant Professor		

●Course Purpose

This seminar deals with various topics in solid state physics, solid state chemistry and materials science. Using a standard textbook written in English, the students give lectures in turn and discuss each other about the contents. They are expected to deepen the understanding of the topics by presentation and discussion during the seminar. They are also expected to improve the skills of reading scientific and technical English.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Energy Engineering Seminar 1B (2.0credits) (エネルギー理工学セミナー1B)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	1 Autumn Semester	
Lecturer	Jun ONOE Professor	Masato NAKAYA Associate Professor

●Course Purpose

This course is a weekly seminar that presents the progress of master's thesis research using slides and then discusses the content to develop deeper insight into the research content and acquire the research “Iroha” It is an object.The goal is communicated in such a way that the research content can be understood by the other person in their own words.

●Prerequisite Subjects

Energy nanomaterials scienceQuantum materials sciencesolid-state physicsEnergy Engineering Seminar 1A

●Course Topics

We will discuss about next topics. (1) Structure, functionality, and properties of nanomaterials (nanocarbons, Metal?organic frameworks, nanoparticles, and functional thin films) (2) Development of methodologies and apparatus of Advased multiscale measurement of nanomaterials (3) Novel methodologies toward control of functionality of nanomaterials (4) Application of nanomaterials

●Textbook

Review papers and research papers will be provided.

●Additional Reading

●Grade Assessment

Comprehensive evaluation by attendance, presentation of seminars and questions and answers, questions on presentations of other students, etc.

●Notes

●Contacting Faculty

Respond during seminar time.

Energy Engineering Seminar 1B (2.0credits) (エネルギー理工学セミナー1B)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	1 Autumn Semester	
Lecturer	Ayae Narutaki Professor	Rintaro TAKAHASHI Assistant Professor

●Course Purpose

The goal of this course for students is to acquire the following knowledge and abilities regarding soft materials at the end of class.

(1) To be able to understand and explain the contents of cutting-edge academic papers.
(2) To be able to understand the background of the research that the students are working on and explain the significance of the research.
(3) To improve the problem-solving ability to optimally conduct the research that the students are working on.

●Prerequisite Subjects

Basic Chemistry, Physical Chemistry, Energy Materials Science, Condensed Matter Physics, Quantum Material Chemistry, Electromagnetism

●Course Topics

Based on a literature survey on the following contents, students will present and discuss the contents of cutting-edge academic papers or the contents of students' research at seminars.

(1) Synthesis, structure, function, and physical properties of soft materials (polymers, colloids, molecular assemblies, gels, etc.)
(2) Analytical method for clarifying the structure, physical properties, and functions of soft materials
(3) Methodology for designing the physical properties and functions of soft materials
(4) Application of soft materials to the energy field

●Textbook

Review articles and the latest research articles are introduced from time to time.

●Additional Reading

Ulf Wiel Gedde, Mikael S. Hedenqvist, Fundamental Polymer Science, Springer.

●Grade Assessment

The lecturers will comprehensively judge the content of presentations, questions and answers, and discussions of the students at the seminar. Based on the goals stated in "Course Purpose", if improvement of ability is recognized, students will be passed, and if more advanced ability is acquired, it will be reflected in the grade accordingly.

●Notes

There are no special registration requirements.
As a general rule, classes will be conducted by distance learning using ICT.

●Contacting Faculty

The lecturers accept questions at any time.

Energy Engineering Seminar 1B (2.0credits) (エネルギー理工学セミナー1B)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	1 Autumn Semester	
Lecturer	Shinya YAGI Professor	Satoshi OGAWA Assistant Professor

●Course Purpose

The aim of this seminar is to understand the basic technical contents about the energy materials, environmental materials, X-ray spectroscopic measurement, and photoelectron spectroscopy measurement methods and physics through the lecture and discussion.

●Prerequisite Subjects

condensed matter theory, electronic structure in materials, quantum mechanics, electromagnetics theory, quantum chemistry, X-ray spectroscopy, instrument of synchrotron radiation

●Course Topics

In this seminar, the following contents will be covered in order to understand basic knowledge about surfaces and bulk, and to promote understanding of the principles, analysis and interpretation of analytical methods to clarify material's structures and chemical bonding states.1: Surface and bulk2: Chemical bonding state3: Nano materials and environmental functional materials4: X-ray spectroscopy, photoelectron spectroscopy5: Various devices for synchrotron radiation facility

●Textbook

"Introduction to Solid State Physics", Kittel, Willy

●Additional Reading

Distribute necessary prints

●Grade Assessment

attendance and implementation of a problem

●Notes

nothing

●Contacting Faculty

e-mail: yagi.shinya@c.mbox.nagoya-u.ac.jpPhone: 052-747-6828

Energy Engineering Seminar 1B (2.0credits) (エネルギー理工学セミナー1B)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Seminar
Course Name	Department of Energy Engineering
Starts 1	1 Autumn Semester
Lecturer	Hideki TOMITA Associate Professor

●Course Purpose
Deep understanding of basic theory and application technique on quantum beam measurement by reading,lecturing and discussing some typical textbooks and/or reference review papers on this field.

●Prerequisite Subjects
Electromagnetism, Quantum Mechanics, Atomic Physics, Material Science, Fundamentals of Nuclear Radiation Measurement

●Course Topics
Physics and techniques on hardware/software systems for quantum beam measurement are studied through each student lecturing a part of reference books and papers with some original exercise in turn.

●Textbook
For example,Radiation Detection and Measurement, 4th ed. ,G.F.Knoll,John Wiley and Sons,2010.

●Additional Reading
Academic journals related to Research and Development of quantum beam measurement, such as IEEE Trans. Nucl. Sci., Nucl. Instrum. Meth., Rev. Sci.Instrum, etc.

●Grade Assessment
Oral Examinations

Grade point:
Pass mark is more than 60 points for full marks of 100 points.

(For students of Year 2020 entrance and later)
100-95:A+, 94-80:A, 79-70:B, 69-65:C, 64-60:C-, <59:F
(For students of Year 2019 entrance and earlier)
100-90:S, 89-80:A, 79-70:B, 69-60:C, <59:F

●Notes
None

Please contact the lecturer of the course.

●Contacting Faculty
The questions will be answered by e-mail.

Address: h-tomita(at)energy.nagoya-u.ac.jp
(Please replace (at) with @.)

Energy Engineering Seminar 1B (2.0credits) (エネルギー理工学セミナー1B)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	1 Autumn Semester	
Lecturer	Michihiro SHIBATA Professor	Yasuaki KOJIMA Associate Professor

●Course Purpose

Reading and presentation by turns basic textbooks and related papers to advance development of the structure of the atomic nucleus and the experimental technique. Understanding about a research trend of the related field, moreover learning about its applicability.Application ability and the invention are put on through these studies. Specifically, the following things are studied. 1. understand and explain the elucidation technique of the nuclear structure by the radiation measurement 2. know a document of nuclear data and a web site necessary to an experiment and utilize appropriately.3. understand the basic thesis the nuclear structure and explain the contents.

●Prerequisite Subjects

Nuclear physics, Quantum mechanics, Radiation measurements

●Course Topics

1. Structure of atomic nuclei1-1. liquid drop model and shell model1-2. collective model and unified model2. Nuclear reaction2-1. Compound nuclei 2-2. Resonance3. Accelerator4. Radiation sources and radioisotope production 5. Radiation measurements and nuclear structure6. Utilization of Nuclear Data libraryShare a technical book or material about the above contents, translate the person in charge into Japanese beforehand, and show translations as well as explain the contents together at the session. Anyone but the person in charge understand the language.

●Textbook

introduce the textbooks in the beginning of the fiscal year

●Additional Reading

introduce books and thesis according to the progress.

●Grade Assessment

Goal attainment level is estimated by the degree of the oral announcement in a seminar, the question and answer to that and the participation in argument. The degree of the preparation and the degree of participation to the oral announcement, the question and answer and the argument are set to 50%, 30% and 20% respectively.

●Notes

No registration conditions required

●Contacting Faculty

in class or officeProf. SHIBATA, Michihiro ex.2569e-mail:i45329a@nucc.cc.nagoya-u.ac.jpAssoc. Prof. KOJIMA, Yasuakiex.2572e-mailkojima.yasuaki@f.mbox.nagoya-u.ac.jp

Energy Engineering Seminar 1B (2.0credits) (エネルギー理工学セミナー1B)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Seminar
Course Name	Department of Energy Engineering
Starts 1	1 Autumn Semester
Lecturer	Yoshiyuki TSUJI Professor

●Course Purpose

Learn the foundamental aspect of energy system.

●Prerequisite Subjects

●Course Topics

●Textbook

S.B.Pope, Turbulent Flow, Cambridge Univ. PressP.A.Davidson, Turbulence, Oxford Univ. Press Other references are served by hard copies.

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Energy Engineering Seminar 1B (2.0credits) (エネルギー理工学セミナー1B)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Department of Energy Engineering		
Starts 1	1 Autumn Semester		
Lecturer	Kiyomasa WATANABE Professor	Eiji IKENAGA Associate Professor	Tatsuya Assistant Professor

●Course Purpose

Deep understanding of fundamental plasma science and engineering by referring the textbook on the following topics: Plasma particle and heat transport, MHD stability of magnetized plasmas, edge plasma phenomena, plasma heating.Through the above methods, the student's skill of the presentation will be improved.Purpose1. Understand the basic characteristics of the MHD equilibrium and instability.2. Understand the contents of the English text book on the MHD equilibrium and instability.3. Summarize the contents of the textbook and explain them to the other persons.

●Prerequisite Subjects

Electromagnetics, Mechanics, physical mathematics, Related Fundamental Physics

●Course Topics

Read an English textbook in Journal club type class1) MHD equilibrium and stability 2) Equilibrium and its control of tokamak plasmas 3) Plasma profile control by plasma heating and magnetic field modifications

●Textbook

●Additional Reading

●Grade Assessment

oral examination and discussion

●Notes

There is no certificate to take this course.

●Contacting Faculty

Energy　Engineering Seminar 1C (2.0credits) (エネルギー理工学セミナー1C)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Department of Energy Engineering		
Starts 1	2 Spring Semester		
Lecturer	Takanori NAGASAKI Professor	TomoakiYAMADA Associate Professor	Junji YUHARA Associate Professor
	Masahito YOSHINO Assistant Professor		

●Course Purpose

This seminar deals with various topics in solid state physics, solid state chemistry and materials science. Using a standard textbook written in English, the students give lectures in turn and discuss each other about the contents. They are expected to deepen the understanding of the topics by presentation and discussion during the seminar. They are also expected to improve the skills of reading scientific and technical English.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Energy　Engineering Seminar 1C (2.0credits) (エネルギー理工学セミナー1C)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	2 Spring Semester	
Lecturer	Jun ONOE Professor	Masato NAKAYA Associate Professor

●Course Purpose

This course is a weekly seminar that presents the progress of master's thesis research using slides and then discusses the content to develop deeper insight into the research content and acquire the research “Iroha” It is an object.Achievement goals are to can answer questions correctly.

●Prerequisite Subjects

Energy nanomaterials scienceQuantum materials sciencesolid-state physicsEnergy Engineering Seminar 1A Energy Engineering Seminar 1B

●Course Topics

We will discuss about next topics. (1) Structure, functionality, and properties of nanomaterials (nanocarbons,　Metal?organic frameworks, nanoparticles, and functional thin films) (2) Development of methodologies and apparatus of Advased multiscale measurement of nanomaterials (3) Novel methodologies toward control of functionality of nanomaterials (4) Application of nanomaterials

●Textbook

Review papers and research papers will be provided.

●Additional Reading

●Grade Assessment

Comprehensive evaluation by attendance, presentation of seminars and questions and answers, questions on presentations of other students, etc.

●Notes

●Contacting Faculty

Respond during seminar time.

Energy　Engineering Seminar 1C (2.0credits) (エネルギー理工学セミナー1C)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	2 Spring Semester	
Lecturer	Ayae Narutaki Professor	Rintaro TAKAHASHI Assistant Professor

●Course Purpose

The goal of this course for students is to acquire the following knowledge and abilities regarding soft materials at the end of class.

(1) To be able to understand and explain the contents of cutting-edge academic papers.
(2) To be able to understand the background of the research that the students are working on and explain the significance of the research.
(3) To improve the problem-solving ability to optimally conduct the research that the students are working on.

●Prerequisite Subjects

Basic Chemistry, Physical Chemistry, Energy Materials Science, Condensed Matter Physics, Quantum Material Chemistry, Electromagnetism

●Course Topics

Based on a literature survey on the following contents, students will present and discuss the contents of cutting-edge academic papers or the contents of students' research at seminars.

(1) Synthesis, structure, function, and physical properties of soft materials (polymers, colloids, molecular assemblies, gels, etc.)
(2) Analytical method for clarifying the structure, physical properties, and functions of soft materials
(3) Methodology for designing the physical properties and functions of soft materials
(4) Application of soft materials to the energy field

●Textbook

Review articles and the latest research articles are introduced from time to time.

●Additional Reading

Ulf Wiel Gedde, Mikael S. Hedenqvist, Fundamental Polymer Science, Springer.

●Grade Assessment

The lecturers will comprehensively judge the content of presentations, questions and answers, and discussions of the students at the seminar. Based on the goals stated in "Course Purpose", if improvement of ability is recognized, students will be passed, and if more advanced ability is acquired, it will be reflected in the grade accordingly.

●Notes

There are no special registration requirements.
As a general rule, classes will be conducted by distance learning using ICT.

●Contacting Faculty

The lecturers accept questions at any time.

Energy　Engineering Seminar 1C (2.0credits) (エネルギー理工学セミナー1C)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	2 Spring Semester	
Lecturer	Shinya YAGI Professor	Satoshi OGAWA Assistant Professor

●Course Purpose

The aim of this seminar is to understand the basic technical contents about the energy materials, environmental materials, X-ray spectroscopic measurement, and photoelectron spectroscopy measurement methods and physics through the lecture and discussion.

●Prerequisite Subjects

condensed matter theory, electronic structure in materials, quantum mechanics, electromagnetics theory, quantum chemistry, X-ray spectroscopy, instrument of synchrotron radiation

●Course Topics

In this seminar, the following contents will be covered in order to understand basic knowledge about surfaces and bulk, and to promote understanding of the principles, analysis and interpretation of analytical methods to clarify material's structures and chemical bonding states.1: Surface and bulk2: Chemical bonding state3: Nano materials and environmental functional materials4: X-ray spectroscopy, photoelectron spectroscopy5: Various devices for synchrotron radiation facility

●Textbook

"Introduction to Solid State Physics", Kittel, Willy

●Additional Reading

Distribute necessary prints

●Grade Assessment

attendance and implementation of a problem

●Notes

nothing

●Contacting Faculty

e-mail: yagi.shinya@c.mbox.nagoya-u.ac.jpPhone: 052-747-6828

Energy　Engineering Seminar 1C (2.0credits) (エネルギー理工学セミナー1C)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Seminar
Course Name	Department of Energy Engineering
Starts 1	2 Spring Semester
Lecturer	Hideki TOMITA Associate Professor

●Course Purpose
Deep understanding of basic theory and application technique on quantum beam measurement by reading,lecturing and discussing some typical textbooks and/or reference review papers on this field.

●Prerequisite Subjects
Electromagnetism, Quantum Mechanics, Atomic Physics, Material Science, Fundamentals of Nuclear Radiation Measurement

●Course Topics
Physics and techniques on hardware/software systems for quantum beam measurement are studied through each student lecturing a part of reference books and papers with some original exercise in turn.

●Textbook
Radiation Detection and Measurement, 4th ed. ,G.F.Knoll,John Wiley and Sons, 2010, or related scientfic journal papers.

●Additional Reading
Academic journals related to Research and Development of quantum beam measurement, such as IEEE Trans. Nucl. Sci., Nucl. Instrum. Meth., Rev. Sci.Instrum, etc.

●Grade Assessment
Oral Examinations
Grade point:
Pass mark is more than 60 points for full marks of 100 points.
(For students of Year 2020 entrance and later)
100-95:A+, 94-80:A, 79-70:B, 69-65:C, 64-60:C-, <59:F
(For students of Year 2019 entrance and earlier)
100-90:S, 89-80:A, 79-70:B, 69-60:C, <59:F

●Notes
None

Please contact the lecturer of the course.

●Contacting Faculty
The questions will be answered by e-mail.

Address: h-tomita(at)energy.nagoya-u.ac.jp
(Please replace (at) with @.)

Energy　Engineering Seminar 1C (2.0credits) (エネルギー理工学セミナー1C)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	2 Spring Semester	
Lecturer	Michihiro SHIBATA Professor	Yasuaki KOJIMA Associate Professor

●Course Purpose

Reading and presentation by turns basic textbooks and related papers to advance development of the structure of the atomic nucleus and the experimental technique. Understanding about a research trend of the related field, moreover learning about its applicability.Application ability and the invention are put on through these studies. Specifically, the following things are studied. 1. understand and explain the elucidation technique of the nuclear structure by the radiation measurement 2. know a document of nuclear data and a web site necessary to an experiment and utilize appropriately.3. understand the basic thesis the nuclear structure and explain the contents.

●Prerequisite Subjects

Nuclear physics, Quantum mechanics, Radiation measurements

●Course Topics

1. Structure of atomic nuclei1-1. liquid drop model and shell model1-2. collective model and unified model2. Nuclear reaction2-1. Compound nuclei 2-2. Resonance3. Accelerator4. Radiation sources and radioisotope production 5. Radiation measurements and nuclear structure6. Utilization of Nuclear Data libraryShare a technical book or material about the above contents, translate the person in charge into Japanese beforehand, and show translations as well as explain the contents together at the session. Anyone but the person in charge understand the language.

●Textbook

introduce the textbooks in the beginning of the fiscal year

●Additional Reading

introduce books and thesis according to the progress.

●Grade Assessment

Goal attainment level is estimated by the degree of the oral announcement in a seminar, the question and answer to that and the participation in argument. The degree of the preparation and the degree of participation to the oral announcement, the question and answer and the argument are set to 50%, 30% and 20% respectively.

●Notes

No registration conditions required

●Contacting Faculty

in class or officeProf. SHIBATA, Michihiro ex.2569e-mail:i45329a@nucc.cc.nagoya-u.ac.jpAssoc. Prof. KOJIMA, Yasuakiex.2572e-mailkojima.yasuaki@f.mbox.nagoya-u.ac.jp

Energy　Engineering Seminar 1C (2.0credits) (エネルギー理工学セミナー1C)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Seminar
Course Name	Department of Energy Engineering
Starts 1	2 Spring Semester
Lecturer	Yoshiyuki TSUJI Professor

●Course Purpose

Learn the foundamental aspect of energy system.

●Prerequisite Subjects

●Course Topics

●Textbook

S.B.Pope, Turbulent Flow, Cambridge Univ. PressP.A.Davidson, Turbulence, Oxford Univ. Press Other references are served by hard copies.

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Energy　Engineering Seminar 1C (2.0credits) (エネルギー理工学セミナー1C)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Department of Energy Engineering		
Starts 1	2 Spring Semester		
Lecturer	Kiyomasa WATANABE Professor	Eiji IKENAGA Associate Professor	Tatsuya Assistant Professor

●Course Purpose

Deep understanding of fundamental plasma science and engineering by referring the textbook on the following topics: Plasma particle and heat transport, MHD stability of magnetized plasmas, edge plasma phenomena, plasma heating.Through the above methods, the student's skill of the presentation will be improved.Purpose1. Understand the basic characteristics of the plasma heating.2. Understand the contents of the English text book on the basic characteristics of the plasma heating.3. Summarize the contents of the textbook and explain them to the other persons.

●Prerequisite Subjects

Electromagnetics, Mechanics, physical mathematics, Related Fundamental Physics

●Course Topics

Read an English textbook in Journal club type class1) Wave propagation in magnetized plasma 2) Energy exchange between plasma waves and particles 3) Momentum exchange between plasma waves and particles, and plasma current drive 4) RF heating 5) Joule heating 6) Control of particle and heat transport 7) Beam injection plasma heating

●Textbook

●Additional Reading

●Grade Assessment

oral examination and discussion

●Notes

There is no certificate to take this course.

●Contacting Faculty

Energy Engineering Seminar 1D (2.0credits) (エネルギー理工学セミナー1D)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Department of Energy Engineering		
Starts 1	2 Autumn Semester		
Lecturer	Takanori NAGASAKI Professor	TomoakiYAMADA Associate Professor	Junji YUHARA Associate Professor
	Masahito YOSHINO Assistant Professor		

●Course Purpose

This seminar deals with various topics in solid state physics, solid state chemistry and materials science. Using a standard textbook written in English, the students give lectures in turn and discuss each other about the contents. They are expected to deepen the understanding of the topics by presentation and discussion during the seminar. They are also expected to improve the skills of reading scientific and technical English.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Energy Engineering Seminar 1D (2.0credits) (エネルギー理工学セミナー1D)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	2 Autumn Semester	
Lecturer	Jun ONOE Professor	Masato NAKAYA Associate Professor

●Course Purpose

This course is a weekly seminar that presents the progress of master's thesis research using slides and then discusses the content to develop deeper insight into the research content and acquire the research “Iroha” It is an object.Achievement goals can be announced at academic conferences and asked questions.

●Prerequisite Subjects

Energy nanomaterials scienceQuantum materials sciencesolid-state physicsEnergy Engineering Seminar 1A Energy Engineering Seminar 1BEnergy Engineering Seminar 1C

●Course Topics

We will discuss about next topics. (1) Structure, functionality, and properties of nanomaterials (nanocarbons, Metal?organic frameworks, nanoparticles, and functional thin films) (2) Development of methodologies and apparatus of Advased multiscale measurement of nanomaterials (3) Novel methodologies toward control of functionality of nanomaterials (4) Application of nanomaterials

●Textbook

Review papers and research papers will be provided.

●Additional Reading

●Grade Assessment

Comprehensive evaluation by attendance, presentation of seminars and questions and answers, questions on presentations of other students, etc.

●Notes

●Contacting Faculty

Respond during seminar time.

Energy Engineering Seminar 1D (2.0credits) (エネルギー理工学セミナー1D)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	2 Autumn Semester	
Lecturer	Ayae Narutaki Professor	Rintaro TAKAHASHI Assistant Professor

●Course Purpose

The goal of this course for students is to acquire the following knowledge and abilities regarding soft materials at the end of class.(1) To be able to understand and explain the contents of cutting-edge academic papers.(2) To be able to understand the background of the research that the students are working on and explain the significance of the research.(3) To improve the problem-solving ability to optimally conduct the research that the students are working on.(4) To write an academic paper on the research that the students are working on.

●Prerequisite Subjects

Basic Chemistry, Physical Chemistry, Energy Materials Science, Condensed Matter Physics, Quantum Material Chemistry, Electromagnetism

●Course Topics

Based on a literature survey on the following contents, students will present and discuss the contents of cutting-edge academic papers or the contents of students' research at seminars.(1) Synthesis, structure, function, and physical properties of soft materials (polymers, colloids, molecular assemblies, gels, etc.)(2) Analytical method for clarifying the structure, physical properties, and functions of soft materials(3) Methodology for designing the physical properties and functions of soft materials(4) Application of soft materials to the energy field

●Textbook

Review articles and the latest research articles are introduced from time to time.

●Additional Reading

Ulf Wiel Gedde, Mikael S. Hedenqvist, Fundamental Polymer Science, Springer.

●Grade Assessment

The lecturers will comprehensively judge the content of presentations, questions and answers, and discussions of the students at the seminar. Based on the goals stated in "Course Purpose", if improvement of ability is recognized, students will be passed, and if more advanced ability is acquired, it will be reflected in the grade accordingly.

●Notes

There are no special registration requirements.As a general rule, classes will be conducted by distance learning using ICT.

●Contacting Faculty

The lecturers accept questions at any time.

Energy Engineering Seminar 1D (2.0credits) (エネルギー理工学セミナー1D)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	2 Autumn Semester	
Lecturer	Shinya YAGI Professor	Satoshi OGAWA Assistant Professor

●Course Purpose

The aim of this seminar is to understand the basic technical contents about the energy materials, environmental materials, X-ray spectroscopic measurement, and photoelectron spectroscopy measurement methods and physics through the lecture and discussion.

●Prerequisite Subjects

condensed matter theory, electronic structure in materials, quantum mechanics, electromagnetics theory, quantum chemistry, X-ray spectroscopy, instrument of synchrotron radiation

●Course Topics

In this seminar, the following contents will be covered in order to understand basic knowledge about surfaces and bulk, and to promote understanding of the principles, analysis and interpretation of analytical methods to clarify material's structures and chemical bonding states.1: Surface and bulk2: Chemical bonding state3: Nano materials and environmental functional materials4: X-ray spectroscopy, photoelectron spectroscopy5: Various devices for synchrotron radiation facility

●Textbook

"Introduction to Solid State Physics", Kittel, Willy

●Additional Reading

Distribute necessary prints

●Grade Assessment

attendance and implementation of a problem

●Notes

nothing

●Contacting Faculty

e-mail: yagi.shinya@c.mbox.nagoya-u.ac.jpPhone: 052-747-6828

Energy Engineering Seminar 1D (2.0credits) (エネルギー理工学セミナー1D)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Seminar
Course Name	Department of Energy Engineering
Starts 1	2 Autumn Semester
Lecturer	Hideki TOMITA Associate Professor

●Course Purpose

Deep understanding of basic theory and application technique on quantum beam measurement by reading,lecturing and discussing some typical textbooks and/or reference review papers on this field

●Prerequisite Subjects

Electromagnetism, Quantum Mechanics, Atomic Physics, Material Science, Fundamentals of Nuclear Radiation Measurement

●Course Topics

Physics and techniques on hardware/software systems for quantum beam measurement are studied through each student lecturing a part of reference books and papers with some original exercise in turn.

●Textbook

Radiation Detection and Measurement, 4th ed. ,G.F.Knoll,John Wiley and Sons, 2010, or related scientfic journal papers.

●Additional Reading

Academic journals related to Research and Development of quantum beam measurement, such as IEEE Trans. Nucl. Sci., Nucl. Instrum. Meth., Rev. Sci.Instrum, etc.

●Grade Assessment

Oral ExaminationsGrade point:Pass mark is more than 60 points for full marks of 100 points.(For students of Year 2020 entrance and later)100-95:A+, 94-80:A, 79-70:B, 69-65:C, 64-60:C-, <59:F(For students of Year 2019 entrance and earlier)100-90:S, 89-80:A, 79-70:B, 69-60:C, <59:F

●Notes

NonePlease contact the lecturer of the course.

●Contacting Faculty

The questions will be answered by e-mail.Address: h-tomita(at)energy.nagoya-u.ac.jp (Please replace (at) with @.)

Energy Engineering Seminar 1D (2.0credits) (エネルギー理工学セミナー1D)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	2 Autumn Semester	
Lecturer	Michihiro SHIBATA Professor	Yasuaki KOJIMA Associate Professor

●Course Purpose

Reading and presentation by turns basic textbooks and related papers to advance development of the structure of the atomic nucleus and the experimental technique. Understanding about a research trend of the related field, moreover learning about its applicability.Application ability and the invention are put on through these studies. Specifically, the following things are studied. 1. understand and explain the elucidation technique of the nuclear structure by the radiation measurement 2. know a document of nuclear data and a web site necessary to an experiment and utilize appropriately.3. understand the basic thesis the nuclear structure and radiation measurements, and explain the contents.

●Prerequisite Subjects

Nuclear physics, Quantum mechanics, Radiation measurements

●Course Topics

1. Structure of atomic nuclei1-1. liquid drop model and shell model1-2. collective model and unified model2. Nuclear reaction2-1. Compound nuclei 2-2. Resonance3. Accelerator4. Radiation sources and radioisotope production 5. Radiation measurements and nuclear structure6. Utilization of Nuclear Data libraryShare a technical book or material about the above contents, translate the person in charge into Japanese beforehand, and show translations as well as explain the contents together at the session. Anyone but the person in charge understand the language.

●Textbook

introduce the textbooks in the beginning of the fiscal year

●Additional Reading

introduce books and thesis according to the progress.

●Grade Assessment

Goal attainment level is estimated by the degree of the oral announcement in a seminar, the question and answer to that and the participation in argument. The degree of the preparation and the degree of participation to the oral announcement, the question and answer and the argument are set to 50%, 30% and 20% respectively.

●Notes

No registration conditions required

●Contacting Faculty

in class or officeProf. SHIBATA, Michihiro ex.2569e-mail:i45329a@nucc.cc.nagoya-u.ac.jpAssoc. Prof. KOJIMA, Yasuakiex.2572e-mailkojima.yasuaki@f.mbox.nagoya-u.ac.jp

Energy Engineering Seminar 1D (2.0credits) (エネルギー理工学セミナー1D)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Seminar
Course Name	Department of Energy Engineering
Starts 1	2 Autumn Semester
Lecturer	Yoshiyuki TSUJI Professor

●Course Purpose

Learn the foundamental aspect of energy system.

●Prerequisite Subjects

●Course Topics

●Textbook

S.B.Pope, Turbulent Flow, Cambridge Univ. PressP.A.Davidson, Turbulence, Oxford Univ. Press Other references are served by hard copies.

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Energy Engineering Seminar 1D (2.0credits) (エネルギー理工学セミナー1D)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Department of Energy Engineering		
Starts 1	2 Autumn Semester		
Lecturer	Kiyomasa WATANABE Professor	Eiji IKENAGA Associate Professor	Tatsuya Assistant Professor

●Course Purpose

Deep understanding of fundamental plasma science and engineering by referring the textbook on the following topics: Plasma particle and heat transport, MHD stability of magnetized plasmas, edge plasma phenomena, plasma heating.Through the above methods, the student's skill of the presentation will be improved.Purpose1. Understand the basic characteristics of the peripheral plasmas.2. Understand the contents of the English text book on the basic characteristics of the peripheral plasmas.3. Summarize the contents of the textbook and explain them to the other persons.

●Prerequisite Subjects

Electromagnetics, Mechanics, physical mathematics, Related Fundamental Physics

●Course Topics

Read an English textbook in Journal club type class1) Interactions between plasma and neutral particles 2) Edge stochastic magnetic field 3) Role of electric field and current on edge plasma phenomena

●Textbook

●Additional Reading

●Grade Assessment

oral examination and discussion

●Notes

There is no certificate to take this course.

●Contacting Faculty

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	
Lecturer	Associated Faculty		

●Course Purpose

The aim of this course is to expand the student’s ability as a researcher by studying in an abroad laboratory and learn different methods and ways of thinking, as well as communicate on a daily base with foreign researchers.

By completing the course, the students are expected to acquire various research methods and ways of thinking, gain the ability to tackle research problems from multiple angles, and acquire a broad international perspective.

●Prerequisite Subjects

Basic and specialized subjects related to the research subject, English, Advanced Lectures on Scientific English

●Course Topics

Students will stay in an abroad laboratory that will be chosen based on the participant’s research field and interest. The course consists of the following contents.

1. Theme setting and literature review
2. Formulating a research plan
3. Analyzing the results and discussion
4. Presentation of the results

After the class, students should review the analyzing processes of the research results and investigate related literatures.

●Textbook
Will be introduced at the host laboratory depending on the research subject

●Additional Reading
Will be introduced at the host laboratory if necessary

●Grade Assessment
Conducting research in an abroad laboratory for one semester and submitting a report is a prerequisite. Evaluation will be based on the student's report (50%) and oral presentation (50%). To pass, the students have to demonstrate that they have the capacity to adequately analyze the results and have acquired the basic knowledge to interpret the results.

●Notes

●Contacting Faculty
Questions will be answered by the supervisors at the host laboratory during the course.

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	
Lecturer	Associated Faculty		

●Course Purpose

The aim of this course is to expand the student’s ability as a researcher by studying in an abroad laboratory and learn different methods and ways of thinking, as well as communicate on a daily base with foreign researchers.

By completing the course, the students are expected to acquire various research methods and ways of thinking, gain the ability to tackle research problems from multiple angles, and acquire a broad international perspective.

●Prerequisite Subjects

Basic and specialized subjects related to the research subject, English, Advanced Lectures on Scientific English

●Course Topics

Students will stay in an abroad laboratory that will be chosen based on the participant’s research field and interest. The course consists of the following contents.

1. Theme setting and literature review
2. Formulating a research plan
3. Analyzing the results and discussion
4. Presentation of the results

After the class, students should review the analyzing processes of the research results and investigate related literatures.

●Textbook
Will be introduced at the host laboratory depending on the research subject

●Additional Reading
Will be introduced at the host laboratory if necessary

●Grade Assessment
Conducting research in an abroad laboratory for two semesters and submitting a report is a prerequisite. Evaluation will be based on the student's report (50%) and oral presentation (50%). To pass, the students have to demonstrate that they have the capacity to adequately analyze the results and have acquired the basic knowledge to interpret the results.

●Notes

●Contacting Faculty
Questions will be answered by the supervisors at the host laboratory during the course.

Thermal Fluid Mechanics in Energy Engineering (2.0credits) (エネルギー熱流体工学)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Lecture
Course Name	Department of Energy Engineering
Starts 1	Autumn Semester ,every other year
Lecturer	Yoshiyuki TSUJI Professor

●Course Purpose

Learn the liquid flows accompanied in various kinds of flow fields. Practical applications will be also discussed.As an advanced content of thermofluidic engineering, we deepen our understanding of phenomena in various flow fields with examples of engineering applications. In order to make effective use of the energy of the system widely, the purpose is to understand how knowledge of thermal fluids is related, what problems are, and the knowledge necessary for its resolution.

●Prerequisite Subjects

Fluid dynamics, Transport phenomena

●Course Topics

*Turbulent flow*Navier-Stokes equaiton*Surface tension*Microscopic structure of the interface*Surface wave*Boiling *Two phase flow

●Textbook

Introduced in the lecture.

●Additional Reading

●Grade Assessment

Examination and exercise reports according to the content of the class (about 80% of grades) and attendance (about 20%) rated out of 100. At the above rate, determine whether the purpose of the lecture has been achieved,more than 60% of achievements will be passed.

●Notes

●Contacting Faculty

whenever it is necessary (Room: Room 119, Building 6 of the Faculty of Engineering, Email:y-tsuji@energy.nagoya-u.ac.jp)

Fundamentals of fluid mechanics in Fusion Plasmas (2.0credits) (核融合プラズマ流体基礎論)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Department of Energy Engineering	
Starts 1	1 Spring Semester	
Lecturer	Kiyomasa WATANABE Professor	Atsushi OKAMOTO Associate Professor

●Course Purpose

Understanding the characteristics of the magneto hydrodynamic equilibrium and the stability of the magnetized plasmas based on Magneto Hydrodynamics (MHD) equations, which is much effective to describe the plasma behavior in the thermo-nuclear fusion reactor and the space. Understanding the characteristics of the plasma in open magnetic field based on the two fluid equations.

●Prerequisite Subjects

Classical Mechanics, Thermodynamics, Statistical mechanics, Electromagnetism

●Course Topics

In this lecture, the equations, that determine the distribution function and its moments, are introduced at the first of all. Next, the (one-fluid) MHD equations are introduced, and the assumptions to derive them are discussed. And the properties of the MHD equilibrium and the instability for the plasmas in the various magnetic configurations are discussed. Finally, the MHD equilibrium and the instability are discussed from aspect of the images as the particles and the fluid. Two-fluid equations are introduced. Starting from explicit representation of the electro static potential, the drift-wave and the sheath are discussed. Based on the two-fluid model, the models describing the divertor plasma are derived, then the spatial distribution of the divertor plasma along the field line is discussed. The atomic processes and the diagnostics relevant to the two-fluid approach are also introduced.

●Textbook

Not specified. Supplementary notes will be distributed during lecture.

●Additional Reading

Jeffrey P. Freidberg "Ideal MHD" Cambridge University Press (2014)Kenro Miyamoto "Plasma Physics and Controlled Nuclear Fusion (Springer Series on Atomic, Optical, and Plasma Physics)" Springer (2013) R.J. Goldston and P.H. Rutherford "Introduction to Plasma Physics" IoP Publishing (1995) Peter C. Stangeby "The Plasma Boundary of Magnetic Fusion Devices" IoP Publishing (2000)

●Grade Assessment

Report

●Notes

There is no certificate to take this course.

●Contacting Faculty

Please send us an e-mail (kiyowata@LHD.nifs.ac.jp or okamoto.atsushi@nagoya-u.jp).

Nuclear Fuels and Materials Engineering (1.0credits) (原子力材料・核燃料工学)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Lecture
Course Name	Department of Energy Engineering
Starts 1	Spring Semester ,every other year
Lecturer	Part-time Faculty

●Course Purpose

In this class, In order to understand the fundamental knowledge of nuclear Materials and fuel, the basic technical issues are generally reviewed and presented taking into account of the relations with the commercial Light Water Reactor (LWR) plants for electric power generation. Students who take this class will be expected to obtain the knowledges and ability as follows;
1. one can technically explain fundamental features of nuclear materials and fuel,
2. one can technically explain behaviors of nuclear materials and fuel under high-flux neutron iradiation, and
3. one can explain the current status of the art on technical problems and research and development trends on the nuclear materials and fuel

●Prerequisite Subjects

No specific prerequisite subjects are required, but 'Nuclear Fuel cycle Engineering' is preferable to master for the background knowledge.

●Course Topics

1. Introduction
2. Overview of the Light Water Reactor Fuel
3. Characteristics of the nuclear reactor environments for the LWR fuel
4. Fabrication
5. Fuel pellet
6. Fuel cladding
7. Fuel rod behavior under irradiation
8. Summary

In the first class, the technical problem to solve by the students who take this class will be given and lecture materials for textbooks are distributed.
Before every lecture the students who take this class should prepare to understand the lecture by studying new technical terms appeared in the lecture materials and note related knowledge on them.
After enery lecture the students who take this class should take note on the related knowledge to the previously given the technical problem that the students should solve finally.
After all lecture given, the students should report on the technical problem to solve that has been given in the first class.

●Textbook

No specific textbook.
The resume of the lecture will be delivered.

●Additional Reading

'Light Water Reactor Fuel behaviors' by Genshiryoku-anzenkyoukai (in Japanese), July1998

●Grade Assessment

Achievements are evaluated by the report on the technical problem presented in the first lecture. The report should be submitted after the final lecture, and the minimum mark for credit is 60/100.

●Notes

- Attendance at the first lecture of the class is mandatory.
- Preparation for every lecture on the previously delivered lecture materials are necessary.
- Preparation to solve a problem prezented at the first lecture after every class is necessary.

●Contacting Faculty

Please feel free to inquire on the lecture and problem solving during the lecture or e-mail in English or in Japanese,

Quantum Beam Science and Engineering (2.0credits) (量子ビーム理工学)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Lecture
Course Name	Department of Energy Engineering
Starts 1	1 Spring Semester
Lecturer	Hideki TOMITA Associate Professor

●Course Purpose
Physics and system designs including signal/information processing on advanced sensors for quantum beam measurement will be lectured from the latest basic research studies and recent topics on their applications

●Prerequisite Subjects
Electromagnetism, Quantum Mechanics, Atomic Physics, Nuclear Radiation Measurement

●Course Topics
1. Introduction, mainly history on quantum beam technology development
2. Theory on interaction of quantum beams with matters
3. Advances in quantum beam sensors
4. Progress on quantum beam sources
5. Isotope measurement with quantum beams
6. Novel spectroscopic/analytical methods with quantum beams

●Textbook
Not specified.

●Additional Reading
Some reference papers related to nuclear radiation detectors selected from academic journals, such as IEEE Trans. Nucl. Sci., Nucl. Instrum. Meth., Rev. Sci. Instrum, J.Nucl.Sci.Tech. etc.

●Grade Assessment
Reports

Grade point:
Pass mark is more than 60 points for full marks of 100 points.
(For students of Year 2020 entrance and later)
100-95:A+, 94-80:A, 79-70:B, 69-65:C, 64-60:C-, <59:F
(For students of Year 2019 entrance and earlier)
100-90:S, 89-80:A, 79-70:B, 69-60:C, <59:F

●Notes
None

Please check the NUCT site of this course.

●Contacting Faculty
Please take an appointment to the instructor with an e-mail.

Address: h-tomita(at)energy.nagoya-u.ac.jp
(Please replace (at) with @.)

Energy Functional Materials Engineering (2.0credits) (エネルギー機能材料工学)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Department of Energy Engineering		
Starts 1	Autumn Semester ,every other year		
Lecturer	Takanori NAGASAKI Professor	TomoakiYAMADA Associate Professor	Junji YUHARA Associate Professor

●Course Purpose

This course deals with diffraction and diffusion phenomena, which are closely related to the physicochemical properties of energy functional materials and their characterization. It also deals with the physical properties and their evaluation of surfaces and interfaces, where peculiar functions tend to appear, and dielectric materials as energy functional materials.

The goal of this course is to
- understand the mathematics and physics behind diffraction and diffusion phenomena,
- understand the physicochemical properties of surface and interface,
- understand the physical properties of dielectric materials and their applications.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Energy materials Science (2.0credits) (エネルギーマテリアル科学)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Department of Energy Engineering		
Starts 1	Spring Semester ,every other year		
Lecturer	Jun ONOE Professor	Ayae Narutaki Professor	Masato NAKAYA Associate Professor

●Course Purpose

This course is a biennial lecture that opens in the even year. Nano/soft materials science and technology will be learned, and we gives lectures aimed at acquiring a wide range of knowledge and perspectives in interdisciplinary fields such as physics, chemistry, engineering, biology, and medicine.

The goal of this course is to
1. Explain basic science of nano/soft materials,
2. Understand the functions and applications of nano/soft materials.
3. Understand the principles and meaning of nano/macro measurements.

●Prerequisite Subjects

Solid state physics, quantum chemistry, polymer science

●Course Topics

Nanomaterials
1) Nanocarbon: fullerene, nanotube, graphene, etc.
2) Nanoparticles
3) Integrated metal complex, etc.
4) Summary

Softmaterials
5) Conductive polymers
6) Ion-conducting polymers
7) Biopolymers and Biodegradable polymers
8) Colloids and Gels

Measurementa
9) Scanning tunneling microscope
10) Atomic force microscope
11) Near-field spectroscopy, etc.
12) Summary

●Textbook

Handouts will be provided.

●Additional Reading

●Grade Assessment

Grades will be evaluated by discussion in lectures and reports.
In particular, if you understand the basic contents of "functions and applications of nanomaterials", "functions and applications of soft materials", and "principles of nano-macro measurements" and can summarize them as a report, you will pass this course. Furthermore, if you can understand more applied contents and discuss them in relation to the latest research papers, we will reflect it in your grade.

●Notes

(1) You will loose the credit of this course if you will be absent more than three times.
(2) For the implementation method for this course, we plan to give face-to-face lectures basically.
But, when the situation of Covid-19 becomes worse, we will switch to use online lectures from time to time.

●Contacting Faculty

Respond at the break time after the lecture or at office hours.

Advanced Nuclear Physics (2.0credits) (応用核物理学)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Department of Energy Engineering	
Starts 1	Autumn Semester ,every other year	
Lecturer	Michihiro SHIBATA Professor	Yasuaki KOJIMA Associate Professor

●Course Purpose

This course deals with the basic concepts of nuclear energies, radioactive decays, nuclear structure and nuclear reactions. The aim of this lecture is to understand of the fundamental properties of nuclei as the basis of nuclear energy and radioactivity, and put on application ability and the invention.The following contents are understood.1. To understand basic properties of atomic nuclei2. To understand the theoretical nuclear model: liquid drop model and shell model 3. To understand the relation between radiation measurements and nuclear structure and also experimental equipment4. To understand the concept of cross section of nuclear reactions, compound nuclear reaction and resonance reaction5. To understand the basic concept of accelerator 6. To understand the nuclear data library

●Prerequisite Subjects

Quantum mechanics, Radiation measurements

●Course Topics

1. Fundamental properties of nuclides2. Radioactivity and radioactive decay3. Nuclear structure4. Nuclear spectroscopy5. Nuclear reaction6. Particle acceleratorReview by a report problem.

●Textbook

references are introduced and slide or prints are distributed as suitable introduction according to the progress of a lecture.

●Additional Reading

Nuclear Physics by YagiNuclear Physics by NagaeNuclear Physics by NonakaIntroduction of Nuclear Physics by Sumi

●Grade Assessment

estimate by the report problem added to tuition's progress. It's done with minimum acceptance standard whether the basic contents are understood, and additional point is estimated by whether the developing contents are being investigated.

●Notes

No registration conditions required

●Contacting Faculty

in class or officeProf. SHIBATA, Michihiro ex.2569e-mail:i45329a@nucc.cc.nagoya-u.ac.jpAssoc. Prof. KOJIMA, Yasuakiex.2572e-mailkojima.yasuaki@f.mbox.nagoya-u.ac.jp

Environmental Functional Materials Engineering (2.0credits) (環境機能材料工学)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Department of Energy Engineering	
Starts 1	1 Autumn Semester	
Lecturer	Shinya YAGI Professor	Eiji IKENAGA Associate Professor

●Course Purpose

This lecture is about a catalysts and functional materials based on a nanoparticle. In particular, this lecture deals with "Why does a nanoparticles work as a catalyst?" and some techniques of measurement. The aim of this lecture is also for saving knowledge about a material analysis.

●Prerequisite Subjects

Physico-chemistry, Surface science, Theory of electronic orbital, Crystallography and X-ray spectroscopy

●Course Topics

1. Surface and bulk ;2. Nanoparticle ;3. Production methods of nanoparticles ;4. Environmental and functional materials ;5. Analytical method ;6. Application of materials

●Textbook

Not specified, but instructions will be given as necessary.

●Additional Reading

Analysis of solid state surface and ; Takaharu Onishi et al., (Kodansha-Scientific)

●Grade Assessment

Discussion in each lecture (80%) and Report works (20%). Minimum mark for credit: 60/100

●Notes

nothing

●Contacting Faculty

e-mail: yagi.shinya@c.mbox.nagoya-u.ac.jpPhone: 052-747-6828

Special Lecture of Energy Engineering Ⅰ (1.0credits) (エネルギー理工学特別講義 Ⅰ)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Lecture
Course Name	Department of Energy Engineering
Starts 1	1 Spring and Autumn Semester
Lecturer	Part-time Faculty

●Course Purpose

Recent topics related to the energy science and engineering are lectured by the specialist outside of Nagoya University, and students obtain the advance knowledge for various research fields.

●Prerequisite Subjects

●Course Topics

Lectures on recent topics related to the energy science and engineering

●Textbook

●Additional Reading

●Grade Assessment

Report. Minimum mark for credit: 60/100

●Notes

No special prerequisite for taking this class.

●Contacting Faculty

Special Lecture of Energy Engineering II (1.0credits) (エネルギー理工学特別講義　II)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Lecture
Course Name	Department of Energy Engineering
Starts 1	1 Spring and Autumn Semester
Lecturer	Part-time Faculty

●Course Purpose

Recent topics related to the energy science and engineering are lectured by the specialist outside of Nagoya University, and students obtain the advance knowledge for various research fields.

●Prerequisite Subjects

●Course Topics

Lectures on recent topics related to the energy science and engineering

●Textbook

●Additional Reading

●Grade Assessment

Report. Minimum mark for credit: 60/100.

●Notes

No special prerequisite for taking this class.

●Contacting Faculty

Special Lecture of Energy Engineering III (1.0credits) (エネルギー理工学特別講義　III)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Lecture
Course Name	Department of Energy Engineering
Starts 1	1 Spring and Autumn Semester
Lecturer	Part-time Faculty

●Course Purpose

Recent topics related to the energy science and engineering are lectured by the specialist outside of Nagoya University, and students obtain the advance knowledge for various research fields.

●Prerequisite Subjects

●Course Topics

Lectures on recent topics related to the energy science and engineering

●Textbook

●Additional Reading

●Grade Assessment

Report. Minimum mark for credit: 60/100.

●Notes

No special prerequisite for taking this course.

●Contacting Faculty

Special Experiment of Energy Engineering with Exercises A (1.0credits) (エネルギー理工学特別実験及び演習Ａ)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Experiment and Exercise		
Course Name	Department of Energy Engineering		
Starts 1	1 Spring Semester		
Lecturer	Takanori NAGASAKI Professor	TomoakiYAMADA Associate Professor	Junji YUHARA Associate Professor
	Masahito YOSHINO Assistant Professor		

●Course Purpose

The basic skills such as the techniques for experiments (calculations), the way of literature searches, the method of report writing, and the way of presentation are needed for research. By the end of the course, students are expected to acquire the basic skills described above.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Special Experiment of Energy Engineering with Exercises A (1.0credits) (エネルギー理工学特別実験及び演習Ａ)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Experiment and Exercise		
Course Name	Department of Energy Engineering		
Starts 1	1 Spring Semester		
Lecturer	Jun ONOE Professor	Masato NAKAYA Associate Professor	Shinta WATANABE Assistant Professor

●Course Purpose

Fabrication, evalution, and thoretical analysis of nanomaterials are fundamentary important in order to carry out reserch about developpement and applycation of nanomatrials in graduate school. The aim of this course is to learn following skills.

(1) Fabrications of nanomaterials, thin film, and devices in ultrahigh vacuum system.
(2) Material synthesis and purification in solution.
(3)Spectroscopies, measurements of electrical and thermoelectrical properties, evaluation of geometrical structure with atomic and molecular scales.
(4) Fablication and evaluation of device strucure
(5) Data analysis using theoretical calculation.

●Prerequisite Subjects

Energy nanomaterials science

●Course Topics

(1) Ultrahigh vaccum system
(2) Theory, methodology, and data analysis of FT-IR spectroscopy
(3) Theory, methodology, and data analysis of UV-VIS-NR spectroscopy
(4) Theory, methodology, and data analysis of STM/STS
(5) Theory, methodology, and data analysis of AFM
(6) Theory, methodology, and data analysis of microscale four prober
(7) Theory, methodology, and data analysis of microscale thermoelectric property mesurements
(8) Theory, methodology, and data analysis of various firstprinciple calculations

●Textbook

Handouts will be provided.

●Additional Reading

●Grade Assessment

Next points are required.
(1) Fully understanding and learning fundamental theory and methodology of apparatuses used for the sample fablication, evaluation, and analysis.
(2) Working on experiments and/or thoretical calculations by an own effort.

●Notes

●Contacting Faculty

Respond at the break time after the lecture or at office hours.

Special Experiment of Energy Engineering with Exercises A (1.0credits) (エネルギー理工学特別実験及び演習Ａ)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Experiment and Exercise	
Course Name	Department of Energy Engineering	
Starts 1	1 Spring Semester	
Lecturer	Ayae Narutaki Professor	Rintaro TAKAHASHI Assistant Professor

●Course Purpose

The goal of this experiment / exercise for the students is to acquire the following knowledge and abilities regarding soft materials according to their research projects.

(1) To understand the physicochemical properties of substances used in the research and be able to handle them appropriately.
(2) To learn how to synthesize and purify macromolecules.
(3) To be able to learn the structural analysis method of macromolecules and to interpret the data appropriately.
(4) Being able to evaluate the function of materials.

●Prerequisite Subjects

Energy Materials Science

●Course Topics

(1) Safety and handling of chemical substances
(2) Protein expression and purification by column chromatography
(3) Soft material structure formation method (self-organization method, electrospinning method, freeze-drying method, etc.)
(4) Principles and experimental methods of scanning electron microscope and transmission electron microscope
(5) Principle of circular dichroism, experimental method and data analysis
(6) Principle of dynamic viscoelasticity measurement, experimental method and data analysis
(7) Principle of small-angle X-ray scattering method, experimental method and data analysis
(8) Electrical characterization and data analysis

●Textbook

Textbooks are introduced according to the progress of experiments and exercises.

●Additional Reading

Ulf Wiel Gedde, Mikael S. Hedenqvist, Fundamental Polymer Science, Springer.

●Grade Assessment

The acceptance criteria are to fully understand the properties of substances required for each research content and the principles of experimental equipment and analysis methods, and to be able to handle experimental equipment and acquire data on their own.

●Notes

There are no special requirements.
Classes are conducted both face-to-face and remotely.

●Contacting Faculty

The lecturers accept questions at any time.

Special Experiment of Energy Engineering with Exercises A (1.0credits) (エネルギー理工学特別実験及び演習Ａ)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Experiment and Exercise	
Course Name	Department of Energy Engineering	
Starts 1	1 Spring Semester	
Lecturer	Shinya YAGI Professor	Satoshi OGAWA Assistant Professor

●Course Purpose

The aim of this seminar is to understand the basic technical contents about the energy materials, environmental materials, X-ray spectroscopic measurement, and photoelectron spectroscopy measurement methods and physics through the lecture and discussion.

●Prerequisite Subjects

condensed matter theory, electronic structure in materials, quantum mechanics, electromagnetics theory, quantum chemistry, X-ray spectroscopy, instrument of synchrotron radiation

●Course Topics

In this seminar, the following contents will be covered in order to understand basic knowledge about surfaces and bulk, and to promote understanding of the principles, analysis and interpretation of analytical methods to clarify material's structures and chemical bonding states.1: Surface and bulk2: Chemical bonding state3: Nano materials and environmental functional materials4: X-ray spectroscopy, photoelectron spectroscopy5: Various devices for synchrotron radiation facility

●Textbook

"Introduction to Solid State Physics", Kittel, Willy

●Additional Reading

depend on the technical contents in each laboratory

●Grade Assessment

●Notes

●Contacting Faculty

e-mail: yagi.shinya@c.mbox.nagoya-u.ac.jpPhone: 052-747-6828

Special Experiment of Energy Engineering with Exercises A (1.0credits) (エネルギー理工学特別実験及び演習Ａ)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Experiment and Exercise
Course Name	Department of Energy Engineering
Starts 1	1 Spring Semester
Lecturer	Hideki TOMITA Associate Professor

●Course Purpose
Deep understanding and experience on recent technology of quantum beam measurement through the original experiments and exercises for each student.

●Prerequisite Subjects
Electromagnetics, Quantum Mechanics, Atomic Physics, Material Science, Fundamentals of Nuclear Radiation Measurement

●Course Topics
Experiments and exercises on some topical subjects in the field of advanced quantum beam measurement using lasers, optical fibers, micro-machining, and new sensor materials.

●Textbook
Introductory textbooks and/or documents on each subject will be given.

●Additional Reading
Some reference papers related to quantum beam measurement selected from academic journals, such as IEEE Trans.Nucl.Sci., Nucl.Instrum. Meth., Rev.Sci.Instrum., etc.

●Grade Assessment
Oral Examinations

Grade point:
Pass mark is more than 60 points for full marks of 100 points.

(For students of Year 2020 entrance and later)
100-95:A+, 94-80:A, 79-70:B, 69-65:C, 64-60:C-, <59:F
(For students of Year 2019 entrance and earlier)
100-90:S, 89-80:A, 79-70:B, 69-60:C, <59:F

●Notes
None

Please contact the lecturer of the course.

●Contacting Faculty
The questions will be answered as needed at experiments and exercises.

Address: h-tomita(at)energy.nagoya-u.ac.jp
(Please replace (at) with @.)

Special Experiment of Energy Engineering with Exercises A (1.0credits) (エネルギー理工学特別実験及び演習Ａ)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Experiment and Exercise	
Course Name	Department of Energy Engineering	
Starts 1	1 Spring Semester	
Lecturer	Michihiro SHIBATA Professor	Yasuaki KOJIMA Associate Professor

●Course Purpose

The objective is to learn various experimental and analytical methods for advanced research topics related to energy science and engineering. The application ability and the invention are put on through these studies. The following contents are studied.1. Understand the properties of radioisotopes and to treat them properly.2. Understand the measurements of radiation from the radioactive decay.3. Treat the HPGe detector properly4. Operate the data acquisition system and analyze the data properly5. Analyze and explain the difference with other experiments based on obatined data.

●Prerequisite Subjects

Nuclear Physics, Quantum Physics, Radiation metrology

●Course Topics

Experiments and Exercises of the following contentsgamma spectrometry with various radiation detectors other radiation detection technique use of the Monte Carlo simulation programAdditionally necessary technological acquisition besides the radiation measurement added to the progress.safe radiation handling technology and experimental technique.Literature search in the past about the studyA matter necessary to technological acquisition or an experiment is acquired beforehand by itself. Documents are investigated as the need arises.

●Textbook

introduce as the need arises.

●Additional Reading

introduce references according to the progress.

●Grade Assessment

Report and oral examination concerning experiments with several times a month and summary report with several times a year. Presentation in a research council or a society according to the progress. Above contents are estimated by 40%, 30% and 30%. The presentation in workshop at least once is necessary by in the lecture A or B.

●Notes

No registration conditions required

●Contacting Faculty

in class or officeProf. SHIBATA, Michihiro ex.2569e-mail:i45329a@nucc.cc.nagoya-u.ac.jpAssoc. Prof. KOJIMA, Yasuakiex.2572e-mailkojima.yasuaki@f.mbox.nagoya-u.ac.jp

Special Experiment of Energy Engineering with Exercises A (1.0credits) (エネルギー理工学特別実験及び演習Ａ)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Experiment and Exercise
Course Name	Department of Energy Engineering
Starts 1	1 Spring Semester
Lecturer	Yoshiyuki TSUJI Professor

●Course Purpose

Learn the foundamental aspect of energy system by the experiments.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Special Experiment of Energy Engineering with Exercises A (1.0credits) (エネルギー理工学特別実験及び演習Ａ)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Experiment and Exercise
Course Name	Department of Energy Engineering
Starts 1	1 Spring Semester
Lecturer	Kiyomasa WATANABE Professor

●Course Purpose

Simulation and numerical analysis for deep understanding of the plasma confinement concept by magnetic field, which is the most important issue on the development research of the thermonuclear fusion reactor.Purpose1. Experience the workflow on the preparation of the programing.2. Experience the programing and the debugging.3. Doing the parameter survey in the calculation and summarize the results.

●Prerequisite Subjects

Electromagnetics, Mechanics, Plasma (Gas discharge) engineering, related fundamental physics

●Course Topics

Doing the programing and summarizing the results on the following subjects.1Calculation of magnetic flux surfaces in the toroidal magnetized plasmas 2. Particle orbit analysis in the toroidal magnetized plasmas

●Textbook

●Additional Reading

●Grade Assessment

Practice and/or Presentations

●Notes

There is no certificate to take this course.

●Contacting Faculty

Special Experiment of Energy Engineering with Exercises B (1.0credits) (エネルギー理工学特別実験及び演習Ｂ)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Experiment and Exercise		
Course Name	Department of Energy Engineering		
Starts 1	1 Autumn Semester		
Lecturer	Takanori NAGASAKI Professor	TomoakiYAMADA Associate Professor	Junji YUHARA Associate Professor
	Masahito YOSHINO Assistant Professor		

●Course Purpose

This course introduces the basic skills needed for research, such as the techniques for experiments (calculations), the way of literature searches, the method of report writing, and the way of presentation. By the end of the course, students are expected to improve the basic skills described above.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Special Experiment of Energy Engineering with Exercises B (1.0credits) (エネルギー理工学特別実験及び演習Ｂ)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Experiment and Exercise		
Course Name	Department of Energy Engineering		
Starts 1	1 Autumn Semester		
Lecturer	Jun ONOE Professor	Masato NAKAYA Associate Professor	Shinta WATANABE Assistant Professor

●Course Purpose

Fabrication, evalution, and thoretical analysis of nanomaterials are fundamentary important in order to carry out reserch about developpement and applycation of nanomatrials in graduate school. The aim of this course is to learn following skills.(1) Fabrications of nanomaterials, thin film, and devices in ultrahigh vacuum system. (2) Material synthesis and purification in solution.(3)Spectroscopies, measurements of electrical and thermoelectrical properties, evaluation of geometrical structure with atomic and molecular scales.(4) Fablication and evaluation of device strucure(5) Data analysis using theoretical calculation.

●Prerequisite Subjects

Energy nanomaterials scienceSpecial Experiment of Energy Engineering with Exercises A

●Course Topics

(1) Ultrahigh vaccum system(2) Theory, methodology, and data analysis of FT-IR spectroscopy(3) Theory, methodology, and data analysis of UV-VIS-NR spectroscopy(4) Theory, methodology, and data analysis of STM/STS(5) Theory, methodology, and data analysis of AFM(6) Theory, methodology, and data analysis of microscale four prober(7) Theory, methodology, and data analysis of microscale thermoelectric property mesurements(8) Theory, methodology, and data analysis of various firstprinciple calculations

●Textbook

Handouts will be provided.

●Additional Reading

●Grade Assessment

Next points are required. (1) Fully understanding and learning fundamental theory and methodology of apparatuses used for the sample fablication, evaluation, and analysis. (2) Working on experiments and/or thoretical calculations by an own effort.

●Notes

●Contacting Faculty

Respond at the break time after the lecture or at office hours.

Special Experiment of Energy Engineering with Exercises B (1.0credits) (エネルギー理工学特別実験及び演習Ｂ)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Experiment and Exercise	
Course Name	Department of Energy Engineering	
Starts 1	1 Autumn Semester	
Lecturer	Ayae Narutaki Professor	Rintaro TAKAHASHI Assistant Professor

●Course Purpose

The goal of this experiment / exercise for the students is to acquire the following knowledge and abilities regarding soft materials according to their research projects.

(1) To understand the physicochemical properties of substances used in the research and be able to handle them appropriately.
(2) To learn how to synthesize and purify macromolecules.
(3) To be able to learn the structural analysis method of macromolecules and to interpret the data appropriately.
(4) Being able to evaluate the function of materials.

●Prerequisite Subjects

Energy Materials Science

●Course Topics

(1) Safety and handling of chemical substances
(2) Protein expression and purification by column chromatography
(3) Soft material structure formation method (self-organization method, electrospinning method, freeze-drying method, etc.)
(4) Principles and experimental methods of scanning electron microscope and transmission electron microscope
(5) Principle of circular dichroism, experimental method and data analysis
(6) Principle of dynamic viscoelasticity measurement, experimental method and data analysis
(7) Principle of small-angle X-ray scattering method, experimental method and data analysis
(8) Electrical characterization and data analysis

●Textbook

Textbooks are introduced according to the progress of experiments and exercises.

●Additional Reading

Ulf Wiel Gedde, Mikael S. Hedenqvist, Fundamental Polymer Science, Springer.

●Grade Assessment

The acceptance criteria are to fully understand the properties of substances required for each research content and the principles of experimental equipment and analysis methods, and to be able to handle experimental equipment and acquire data on their own.

●Notes

There are no special requirements.
Classes are conducted both face-to-face and remotely.

●Contacting Faculty

The lecturers accept questions at any time.

Special Experiment of Energy Engineering with Exercises B (1.0credits) (エネルギー理工学特別実験及び演習Ｂ)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Experiment and Exercise	
Course Name	Department of Energy Engineering	
Starts 1	1 Autumn Semester	
Lecturer	Shinya YAGI Professor	Satoshi OGAWA Assistant Professor

●Course Purpose

The aim of this seminar is to understand the basic technical contents about the energy materials, environmental materials, X-ray spectroscopic measurement, and photoelectron spectroscopy measurement methods and physics through the lecture and discussion.

●Prerequisite Subjects

condensed matter theory, electronic structure in materials, quantum mechanics, electromagnetics theory, quantum chemistry, X-ray spectroscopy, instrument of synchrotron radiation

●Course Topics

In this seminar, the following contents will be covered in order to understand basic knowledge about surfaces and bulk, and to promote understanding of the principles, analysis and interpretation of analytical methods to clarify material's structures and chemical bonding states.1: Surface and bulk2: Chemical bonding state3: Nano materials and environmental functional materials4: X-ray spectroscopy, photoelectron spectroscopy5: Various devices for synchrotron radiation facility

●Textbook

"Introduction to Solid State Physics", Kittel, Willy

●Additional Reading

Distribute necessary prints

●Grade Assessment

●Notes

●Contacting Faculty

e-mail: yagi.shinya@c.mbox.nagoya-u.ac.jpPhone: 052-747-6828

Special Experiment of Energy Engineering with Exercises B (1.0credits) (エネルギー理工学特別実験及び演習Ｂ)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Experiment and Exercise
Course Name	Department of Energy Engineering
Starts 1	1 Autumn Semester
Lecturer	Hideki TOMITA Associate Professor

●Course Purpose
Deep understanding and experience on recent technology of quantum beam measurement through the original experiments and exercises for each student.

●Prerequisite Subjects
Electromagnetics, Quantum Mechanics, Atomic Physics, Material Science, Fundamentals of Nuclear Radiation Measurement

●Course Topics
Experiments and exercises on some topical subjects in the field of advanced quantum beam measurement using lasers, optical fibers, micro-machining, and new sensor materials.

●Textbook
Introductory textbooks and/or documents on each subject will be given.

●Additional Reading
Some reference papers related to quantum beam measurement selected from academic journals, such as IEEE Trans.Nucl.Sci., Nucl.Instrum. Meth., Rev.Sci.Instrum., etc.

●Grade Assessment
Oral Examinations

Grade point:
Pass mark is more than 60 points for full marks of 100 points.

(For students of Year 2020 entrance and later)
100-95:A+, 94-80:A, 79-70:B, 69-65:C, 64-60:C-, <59:F
(For students of Year 2019 entrance and earlier)
100-90:S, 89-80:A, 79-70:B, 69-60:C, <59:F

●Notes
None

Please contact the lecturer of the course.

●Contacting Faculty
The questions will be answered as needed at experiments and exercises.

Address: h-tomita(at)energy.nagoya-u.ac.jp
(Please replace (at) with @.)

Special Experiment of Energy Engineering with Exercises B (1.0credits) (エネルギー理工学特別実験及び演習Ｂ)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Experiment and Exercise	
Course Name	Department of Energy Engineering	
Starts 1	1 Autumn Semester	
Lecturer	Michihiro SHIBATA Professor	Yasuaki KOJIMA Associate Professor

●Course Purpose

The objective is to learn various experimental and analytical methods for advanced research topics related to energy science and engineering. The application ability and the invention are put on through these studies. The following contents are studied.1. Understand the properties of radioisotopes and to treat them properly.2. Understand the measurements of radiation from the radioactive decay.3. Treat the HPGe detector properly4. Operate the data acquisition system and analyze the data properly5. Analyze and explain the difference with other experiments based on obatined data.6. Understand and explain the trend of the nuclear data study.

●Prerequisite Subjects

Nuclear Physics, Quantum Physics, Radiation metrology

●Course Topics

Experiments and Exercises of the following contentsgamma spectrometry with various radiation detectors other radiation detection technique use of the Monte Carlo simulation programAdditionally necessary technological acquisition besides the radiation measurement added to the progress.safe radiation handling technology and experimental technique.Literature search in the past about the studyA matter necessary to technological acquisition or an experiment is acquired beforehand by itself. Documents are investigated as the need arises.

●Textbook

introduce as the need arises.

●Additional Reading

introduce references according to the progress.

●Grade Assessment

Report and oral examination concerning experiments with several times a month and summary report with several times a year. Presentation in a research council or a society according to the progress. Above contents are estimated by 40%, 30% and 30%. The presentation in workshop at least once is necessary by in the lecture A or B.

●Notes

No registration conditions required

●Contacting Faculty

in class or officeProf. SHIBATA, Michihiro ex.2569e-mail:i45329a@nucc.cc.nagoya-u.ac.jpAssoc. Prof. KOJIMA, Yasuakiex.2572e-mailkojima.yasuaki@f.mbox.nagoya-u.ac.jp

Special Experiment of Energy Engineering with Exercises B (1.0credits) (エネルギー理工学特別実験及び演習Ｂ)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Experiment and Exercise
Course Name	Department of Energy Engineering
Starts 1	1 Autumn Semester
Lecturer	Yoshiyuki TSUJI Professor

●Course Purpose

Learn the foundamental aspect of energy system by the experiments.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Special Experiment of Energy Engineering with Exercises B (1.0credits) (エネルギー理工学特別実験及び演習Ｂ)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Experiment and Exercise
Course Name	Department of Energy Engineering
Starts 1	1 Autumn Semester
Lecturer	Kiyomasa WATANABE Professor

●Course Purpose

Experiments and analysis on the measurement of plasma parameters in the magnetized plasmas, which is the most important issue on the development research of the thermonuclear fusion reactor.Purpose1. Understand the principle of the diagnostics system, and manufacturing the basic one.2. Performance of the diagnostics system should be examined. 3. Measurement of a plasma parameter by the diagnostics system.

●Prerequisite Subjects

Electromagnetics, Mechanics, Plasma (Gas discharge) engineering, related fundamental physics

●Course Topics

Practice on the fluctuation analysis of the plasma parameter on the following subjects.1. Making of magnetic fluctuation probe and plasma fluctuation analysis by it 2. Making of measurement system of the plasma density and plasma fluctuation analysis by it

●Textbook

●Additional Reading

●Grade Assessment

●Notes

There is no certificate to take this course.

●Contacting Faculty

Experiment of Quantum Beam (2.0credits) (量子ビーム実験)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Experiment
Course Name	Department of Energy Engineering
Starts 1	1 Spring Semester
Lecturer	Shinya YAGI Professor

●Course Purpose

The aim is to understand the nature of the quantum beam (X-ray) and advance the ability to find the physical properties. Both an X-ray absorption fine structure (XAFS) using synchrotron light source (Aichi-SR center) and an X-ray diffraction method (XRD) are scheduled as measurement techniques.

●Prerequisite Subjects

Electromagnetism, Crystallography, Physico-chemistry, Surface science and X-ray spectroscopy

●Course Topics

This experiment consists of a lecture (principle of an analytical method and analysis method of the results), an experiment (XAFS and XRD) and a summary.

●Textbook

Not specified, but instructions will be given as necessary.

●Additional Reading

Not specified, but instructions will be given as necessary.

●Grade Assessment

Score is authorized by attendance (whole lectures and experiments) and report problems.

●Notes

●Contacting Faculty

e-mail: yagi.shinya@c.mbox.nagoya-u.ac.jpPhone: 052-747-6828

Ethics and Security in Engineering (2.0credits) (工学のセキュリティと倫理)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Chemical Systems Engineering
	Electrical Engineering	Electronics	Information and Communication Engineering
	Mechanical Systems Engineering	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering
	Department of Energy Engineering	Department of Applied Energy	
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	
Lecturer	Hideo KISHIDA Professor		

●Course Purpose

The aim of the lecture is to understand ethics, intellectual property rights, information security required at the start of master thesis research. After taking this course, the students are expected to have abilities on:

1. Understanding of Ethics for engineers
2. Understanding of Ethics for researcher
3. Understanding of Intellectual property rights
4. Understanding of Information security

●Prerequisite Subjects

None because this is one of the common basic subject for future activity as a researcher or an engineer.

●Course Topics

1) Introduction,
2)Ethics for engineers,
3)Ethics for researchers,
4)Intellectual property rights,
5)Information security,
6)Summary

Submission of the report after each class is mandatory.

●Textbook

Instead of using textbook, original lecture notes will be provided at each class.

●Additional Reading

Original lecture notes will be provided at each class.

●Grade Assessment

Credits will be awarded to those students who score 'Pass' based on the reports and /or subjects given by each lecture.

●Notes

None because this is one of the common basic subject for future activity as a researcher or an engineer.

●Contacting Faculty

After each class student can ask in person.
Otherwise, contact to:

Prof. Kishida kishida@nagoya-u.jp

Safety and Reliability in Engineering (2.0credits) (安全・信頼性工学)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Electrical Engineering	Electronics	Information and Communication Engineering
	Mechanical Systems Engineering	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering
	Department of Energy Engineering	Department of Applied Energy	
Starts 1	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester	1 Spring Semester	
Lecturer	"YAMAMOTO Akio" Professor	Masahiro Arai Professor	Takaya INAMORI Associate Professor
	Part-time Faculty		

●Course Purpose

Safety and reliability are one of the most important issues in all engineering fields. In this lecture, the aerospace engineering field and nuclear engineering field, which are the symbolic entities of integrated engineering, will be linked, and the lecturers who have many years of experience in the space, aviation, and nuclear industries will understand students from other fields. The aim is to learn the basics and practice of safety and reliability engineering, while giving consideration to it. In addition, by attending this lecture with assignments and exercises, you can acquire the concept of ensuring safety and reliability in all industrial fields, and acquire useful skills regardless of progress in any field in the future.

By learning this lecture, the goal is to acquire the following skills.
(1) Understand and apply basic concepts of safety and reliability.
(2) Understand and apply safety concepts and application examples in the aerospace field.
(3) Understand and apply safety concepts and application examples in the field of nuclear power.

●Prerequisite Subjects

There are no special subjects required to take this course.

●Course Topics

(1) Basics of Safety and reliability engineering including FMEA and FTA
(2) Safety and reliability in aerospace engineering
(3) Safety fundamentals and safety design in nuclear engineering
(4) Hazard assessments in nuclear engineering
(5) Accidents in nuclear facilities and lessons learned

Gather information on relevant areas before each lecture. After the lecture, review the content and work on the examples again. To submit a report assignment in the first and second half, submit it.

●Textbook

Materials will be distributed in each lecture. Introduce textbooks as necessary.

●Additional Reading

References in Japanese, regarding to reliability analysis and FMEA, FTA.

●Grade Assessment

Evaluate the degree of achievement for the achievement target in the report. Understand the basic concepts of safety and reliability in the aerospace and nuclear fields, and pass if applicable.

●Notes

None

●Contacting Faculty

As a general rule, it corresponds to the break time during class hours and after the class ends. In other cases, it is possible to respond at any time.

Innovation Practice Course (4.0credits) (イノベーション体験プロジェクト)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Experiment and Exercise		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	
Lecturer	Shinji DOKI Professor		

●Course Purpose

Under the instruction of the company engineer (DP, Directing Professor), I carry out the project for the problem solution by the team of several people consisting of different specialisms. In this way, it is intended to let you sense ability for problem discovery, the importance of the general intellectual power of compound eyes on the basis of real world bodily.
I know a point of view, the plan as the company and perform a discussion, exchange of opinions between the different specialty and aim for the breeding of the viewpoint general, to see engineering by examining it as the problem solution person concerned from different angles.

●Prerequisite Subjects

It is strongly recommended to take the industry-university joint educational courses such as Focus on Venture Business and ,etc.

●Course Topics

I organize different specialty, the team (several/team) consisting of the students of the department several sets, and DP is the instruction in each each team. Based on the project theme that DP determined, I set the problem that a student carries out concretely. For 75 hours (principle one day a week), I accomplish the project for the problem solution.
Prior lecture to affect a project theme by the DP
Setting (opinion, information exchange, allied investigation, examination, discussion) of the concrete problem by the student
Enforcement of the problem solution project
Summary, report of the result

I assume this a main component.
In addition, I may be given an investigation and the consideration in conjunction with the theme as a problem from DP. Report it in a date (the next time lectures) when it was appointed, and announce it; and a thing corresponding to the exchange of opinions in the team.

●Textbook

Papers, books and/or documents that the lecturer (DP) will introduce.

●Additional Reading

Papers, books and/or documents that the lecturer (DP) will introduce.

●Grade Assessment

I evaluate it through accomplishment, the discussion of the project, result announcement. If a consideration power, the adjustability for the problem solution, the expansion of the field of vision are accepted, it is said that I pass.

●Notes

No specific requirements.

●Contacting Faculty

The lecturer (DP) and the project staff of the university accept questions at any time.

Research Internship１ U2 (2.0credits) (研究インターンシップ１ U2)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Practice		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	
Lecturer	Shinji DOKI Professor		

●Course Purpose

Through the training to affect technology development, the study of the company in the company is advanced, and experience the challenge to a practical problem. In this way, it is aimed for upbringing of human resources tying engineering to creation of the social value.
It is wider in a technique and a study, and a consciousness, ability to catch in a general viewpoint (utility, economy) and communication power is bred and aims for what is reflected by a study, the study at the university.

●Prerequisite Subjects

It is strongly recommended to take the industry-university joint educational courses such as Focus on Venture Business and ,etc.

●Course Topics

In the company accepting an intern, I make the training (study) about the study theme that a company shows.
Orientation to affect the overall company concerned and the training medium
Enforcement (including cooperation, the adjustment with the company staff) of the training theme
Summary, report of the training result
I assume a report (presentation) of the training result to the university a main component.
As the associated document, documents investigation may not support during the working hours that a company sets, I do the attendance of the lecture about "the handling, a point to keep in mind by basic knowledge and the study internship of intellectual property rights" to need what I study in the training overtime by oneself, and to perform on the university side prior to the company training again with

requisiteness.

●Textbook

Papers, books and/or documents that the staff instructing the training in the company will introduce.

●Additional Reading

Papers, books and/or documents that the staff instructing the training in the company will introduce.

●Grade Assessment

I am given in the following on 20th in the total days that engaged in the training in the company.
I do that I announce the result to the university in a result briefing session to perform after the training if essential.
I evaluate it based on result announcement contents and an evaluation book of the training staff making. I recognize an experience-based effect in the training by oneself, and will to plan reflection to a study, the study at the university does it with a pass if admitted.

●Notes

No specific requirements.

●Contacting Faculty

The training staff of the company and the study internship staff of the university accept questions at any time.

Research Internship１ U3 (3.0credits) (研究インターンシップ１ U3)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Practice		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	
Lecturer	Shinji DOKI Professor		

●Course Purpose

Through the training to affect technology development, the study of the company in the company is advanced, and experience the challenge to a practical problem. In this way, it is aimed for upbringing of human resources tying engineering to creation of the social value.
It is wider in a technique and a study, and a consciousness, ability to catch in a general viewpoint (utility, economy) and communication power is bred and aims for what is reflected by a study, the study at the university.

●Prerequisite Subjects

It is strongly recommended to take the industry-university joint educational courses such as Focus on Venture Business and ,etc.

●Course Topics

In the company accepting an intern, I make the training (study) about the study theme that a company shows.
Orientation to affect the overall company concerned and the training medium
Enforcement (including cooperation, the adjustment with the company staff) of the training theme
Summary, report of the training result
I assume a report (presentation) of the training result to the university a main component.
As the associated document, documents investigation may not support during the working hours that a company sets, I do the attendance of the lecture about "the handling, a point to keep in mind by basic knowledge and the study internship of intellectual property rights" to need what I study in the training overtime by oneself, and to perform on the university side prior to the company training again with

requisiteness.

●Textbook

Papers, books and/or documents that the staff instructing the training in the company will introduce.

●Additional Reading

Papers, books and/or documents that the staff instructing the training in the company will introduce.

●Grade Assessment

The credits will be given to the students who have had the working days between 21 and 40 days in the internship company.

●Notes

No specific requirements.

●Contacting Faculty

The training staff of the company and the study internship staff of the university accept questions at any time.

Research Internship１ U4 (4.0credits) (研究インターンシップ１ U4)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Practice		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	
Lecturer	Shinji DOKI Professor		

●Course Purpose

Through the training to affect technology development, the study of the company in the company is advanced, and experience the challenge to a practical problem. In this way, it is aimed for upbringing of human resources tying engineering to creation of the social value.
It is wider in a technique and a study, and a consciousness, ability to catch in a general viewpoint (utility, economy) and communication power is bred and aims for what is reflected by a study, the study at the university.

●Prerequisite Subjects

It is strongly recommended to take the industry-university joint educational courses such as Focus on Venture Business and ,etc.

●Course Topics

In the company accepting an intern, I make the training (study) about the study theme that a company shows.
Orientation to affect the overall company concerned and the training medium
Enforcement (including cooperation, the adjustment with the company staff) of the training theme
Summary, report of the training result
I assume a report (presentation) of the training result to the university a main component.
As the associated document, documents investigation may not support during the working hours that a company sets, I do the attendance of the lecture about "the handling, a point to keep in mind by basic knowledge and the study internship of intellectual property rights" to need what I study in the training overtime by oneself, and to perform on the university side prior to the company training again with

requisiteness.

●Textbook

Papers, books and/or documents that the staff instructing the training in the company will introduce.

●Additional Reading

Papers, books and/or documents that the staff instructing the training in the company will introduce.

●Grade Assessment

The credits will be given to the students who have had the working days between 41 and 60 days in the internship company.

●Notes

No specific requirements.

●Contacting Faculty

The training staff of the company and the study internship staff of the university accept questions at any time.

Research Internship１ U6 (6.0credits) (研究インターンシップ１ U6)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Practice		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	
Lecturer	Shinji DOKI Professor		

●Course Purpose

Through the training to affect technology development, the study of the company in the company is advanced, and experience the challenge to a practical problem. In this way, it is aimed for upbringing of human resources tying engineering to creation of the social value.
It is wider in a technique and a study, and a consciousness, ability to catch in a general viewpoint (utility, economy) and communication power is bred and aims for what is reflected by a study, the study at the university.

●Prerequisite Subjects

It is strongly recommended to take the industry-university joint educational courses such as Focus on Venture Business and ,etc.

●Course Topics

In the company accepting an intern, I make the training (study) about the study theme that a company shows.
Orientation to affect the overall company concerned and the training medium
Enforcement (including cooperation, the adjustment with the company staff) of the training theme
Summary, report of the training result
I assume a report (presentation) of the training result to the university a main component.
As the associated document, documents investigation may not support during the working hours that a company sets, I do the attendance of the lecture about "the handling, a point to keep in mind by basic knowledge and the study internship of intellectual property rights" to need what I study in the training overtime by oneself, and to perform on the university side prior to the company training again with

requisiteness.

●Textbook

Papers, books and/or documents that the staff instructing the training in the company will introduce.

●Additional Reading

Papers, books and/or documents that the staff instructing the training in the company will introduce.

●Grade Assessment

The credits will be given to the students who have had the working days between 61 and 80 days in the internship company.

●Notes

No specific requirements.

●Contacting Faculty

The training staff of the company and the study internship staff of the university accept questions at any time.

Research Internship１ U8 (8.0credits) (研究インターンシップ１ U8)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Practice		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	
Lecturer	Shinji DOKI Professor		

●Course Purpose

Through the training to affect technology development, the study of the company in the company is advanced, and experience the challenge to a practical problem. In this way, it is aimed for upbringing of human resources tying engineering to creation of the social value.
It is wider in a technique and a study, and a consciousness, ability to catch in a general viewpoint (utility, economy) and communication power is bred and aims for what is reflected by a study, the study at the university.

●Prerequisite Subjects

Students attending Research Internship are strongly recommended to take short-term Patent Laws and Focus on Venture Business I or II before the attendance.

●Course Topics

In the company accepting an intern, I make the training (study) about the study theme that a company shows.
Orientation to affect the overall company concerned and the training medium
Enforcement (including cooperation, the adjustment with the company staff) of the training theme
Summary, report of the training result
I assume a report (presentation) of the training result to the university a main component.
As the associated document, documents investigation may not support during the working hours that a company sets, I do the attendance of the lecture about "the handling, a point to keep in mind by basic knowledge and the study internship of intellectual property rights" to need what I study in the training overtime by oneself, and to perform on the university side prior to the company training again with

requisiteness.

●Textbook

Papers, books and/or documents that the staff instructing the training in the company will introduce.

●Additional Reading

Papers, books and/or documents that the staff instructing the training in the company will introduce.

●Grade Assessment

The credits will be given to the students who have had the working days more than or equal to 81 daysin the internship company.

●Notes

No specific requirements.

●Contacting Faculty

The training staff of the company and the study internship staff of the university accept questions at any time.

Laboratory Visit 1 U2 (2.0credits) (研究室ローテーション１ U2)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Practice		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Chemical Systems Engineering	Department of Energy Engineering	Department of Applied Energy
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
Lecturer	Associated Faculty		

●Course Purpose

The aim of this course is to expand the student’s ability as a researcher by conducting a research at a different laboratory and learn different methods and ways of thinking, as well as communicate with other researchers in related fields.By completing the course, the students are expected to acquire various research methods and ways of thinking, and gain the ability to tackle research problems from multiple angles.

●Prerequisite Subjects

Basic and specialized subjects related to the research subject

●Course Topics

Students will conduct research at a different laboratory. The host laboratory will be chosen based on the participant’s research field and interest from other laboratories within the campus, other universities, research institutes and companies. The course consists of the following contents.1. Theme setting and literature review2. Formulating the research plan3. Analyzing the results and discussion4. Presentation of the resultsAfter the class, students should review the analyzing process of the obtained results and investigate related literatures.

●Textbook

Will be introduced at the host laboratory depending on the research subject

●Additional Reading

Will be introduced at the host laboratory if necessary

●Grade Assessment

Up to 20 days research in the host laboratory and submitting a report is a prerequisite. Evaluation will be based on the student's report and the evaluation by the supervisor in the host laboratory. To pass, the students have to demonstrate that they have the capacity to adequately analyze the results and have acquired the basic knowledge to interpret the results. Grading will be decided from P (pass) or NP (not passed).

●Notes

Nothing particularly needed

●Contacting Faculty

Questions will be answered by the supervisors at the host laboratory during the course.

Laboratory Visit 1 U3 (3.0credits) (研究室ローテーション１ U3)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Practice		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Chemical Systems Engineering	Department of Energy Engineering	Department of Applied Energy
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
Lecturer	Associated Faculty		

●Course Purpose

The aim of this course is to expand the student’s ability as a researcher by conducting a research at a different laboratory and learn different methods and ways of thinking, as well as communicate with other researchers in related fields.By completing the course, the students are expected to acquire various research methods and ways of thinking, and gain the ability to tackle research problems from multiple angles.

●Prerequisite Subjects

Basic and specialized subjects related to the research subject

●Course Topics

Students will conduct research at a different laboratory. The host laboratory will be chosen based on the participant’s research field and interest from other laboratories within the campus, other universities, research institutes and companies. The course consists of the following contents.1. Theme setting and literature review2. Formulating the research plan3. Analyzing the results and discussion4. Presentation of the resultsAfter the class, students should review the analyzing process of the obtained results and investigate related literatures.

●Textbook

Will be introduced at the host laboratory depending on the research subject

●Additional Reading

Will be introduced at the host laboratory if necessary

●Grade Assessment

21 days or more and 40 days or less research in the host laboratory and submitting a report is a prerequisite. Evaluation will be based on the student's report and the evaluation by the supervisor in the host laboratory. To pass, the students have to demonstrate that they have the capacity to adequately analyze the results and have acquired the basic knowledge to interpret the results. Grading will be decided from P (pass) or NP (not passed).

●Notes

Nothing particularly needed

●Contacting Faculty

Questions will be answered by the supervisors at the host laboratory during the course.

Laboratory Visit 1 U4 (4.0credits) (研究室ローテーション１ U4)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Practice		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Chemical Systems Engineering	Department of Energy Engineering	Department of Applied Energy
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
Lecturer	Associated Faculty		

●Course Purpose

The aim of this course is to expand the student’s ability as a researcher by conducting a research at a different laboratory and learn different methods and ways of thinking, as well as communicate with other researchers in related fields.By completing the course, the students are expected to acquire various research methods and ways of thinking, and gain the ability to tackle research problems from multiple angles.

●Prerequisite Subjects

Basic and specialized subjects related to the research subject

●Course Topics

Students will conduct research at a different laboratory. The host laboratory will be chosen based on the participant’s research field and interest from other laboratories within the campus, other universities, research institutes and companies. The course consists of the following contents.1. Theme setting and literature review2. Formulating the research plan3. Analyzing the results and discussion4. Presentation of the resultsAfter the class, students should review the analyzing process of the obtained results and investigate related literatures.

●Textbook

Will be introduced at the host laboratory depending on the research subject

●Additional Reading

Will be introduced at the host laboratory if necessary

●Grade Assessment

41 days or more and 60 days or less research in the host laboratory and submitting a report is a prerequisite. Evaluation will be based on the student's report and the evaluation by the supervisor in the host laboratory. To pass, the students have to demonstrate that they have the capacity to adequately analyze the results and have acquired the basic knowledge to interpret the results. Grading will be decided from P (pass) or NP (not passed).

●Notes

Nothing particularly needed

●Contacting Faculty

Questions will be answered by the supervisors at the host laboratory during the course.

Laboratory Visit 1 U6 (6.0credits) (研究室ローテーション１ U6)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Practice		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Chemical Systems Engineering	Department of Energy Engineering	Department of Applied Energy
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
Lecturer	Associated Faculty		

●Course Purpose

The aim of this course is to expand the student’s ability as a researcher by conducting a research at a different laboratory and learn different methods and ways of thinking, as well as communicate with other researchers in related fields.By completing the course, the students are expected to acquire various research methods and ways of thinking, and gain the ability to tackle research problems from multiple angles.

●Prerequisite Subjects

Basic and specialized subjects related to the research subject

●Course Topics

Students will conduct research at a different laboratory. The host laboratory will be chosen based on the participant’s research field and interest from other laboratories within the campus, other universities, research institutes and companies. The course consists of the following contents.1. Theme setting and literature review2. Formulating the research plan3. Analyzing the results and discussion4. Presentation of the resultsAfter the class, students should review the analyzing process of the obtained results and investigate related literatures.

●Textbook

Will be introduced at the host laboratory depending on the research subject

●Additional Reading

Will be introduced at the host laboratory if necessary

●Grade Assessment

61 days or more and 80 days or less research in the host laboratory and submitting a report is a prerequisite. Evaluation will be based on the student's report and the evaluation by the supervisor in the host laboratory. To pass, the students have to demonstrate that they have the capacity to adequately analyze the results and have acquired the basic knowledge to interpret the results. Grading will be decided from P (pass) or NP (not passed).

●Notes

Nothing particularly needed

●Contacting Faculty

Questions will be answered by the supervisors at the host laboratory during the course.

Laboratory Visit 1 U8 (8.0credits) (研究室ローテーション１ U8)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Practice		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Chemical Systems Engineering	Department of Energy Engineering	Department of Applied Energy
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
Lecturer	Associated Faculty		

●Course Purpose

The aim of this course is to expand the student’s ability as a researcher by conducting a research at a different laboratory and learn different methods and ways of thinking, as well as communicate with other researchers in related fields.By completing the course, the students are expected to acquire various research methods and ways of thinking, and gain the ability to tackle research problems from multiple angles.

●Prerequisite Subjects

Basic and specialized subjects related to the research subject

●Course Topics

Students will conduct research at a different laboratory. The host laboratory will be chosen based on the participant’s research field and interest from other laboratories within the campus, other universities, research institutes and companies. The course consists of the following contents.1. Theme setting and literature review2. Formulating the research plan3. Analyzing the results and discussion4. Presentation of the resultsAfter the class, students should review the analyzing process of the obtained results and investigate related literatures.

●Textbook

Will be introduced at the host laboratory depending on the research subject

●Additional Reading

Will be introduced at the host laboratory if necessary

●Grade Assessment

81 days or more research in the host laboratory and submitting a report is a prerequisite. Evaluation will be based on the student's report and the evaluation by the supervisor in the host laboratory. To pass, the students have to demonstrate that they have the capacity to adequately analyze the results and have acquired the basic knowledge to interpret the results. Grading will be decided from P (pass) or NP (not passed).

●Notes

Nothing particularly needed

●Contacting Faculty

Questions will be answered by the supervisors at the host laboratory during the course.

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	
Lecturer	Manato DEKI Associate Professor		

●Course Purpose

To research in advanced engineering, it is necessary to learn the latest research trends through practice. Through symposium-style academic discussions, students will be able to study cutting-edge science and engineering research and discuss the latest trends in the subject areas.

●Prerequisite Subjects

Knowledge of the subject areas.

●Course Topics

Participated in special lectures set every year from the fields of biochemistry, analysis, semiconductors, polymers, and startups related to cutting-edge science and engineering, and participated in a symposium where research presentations on cutting-edge engineering were presented. By participating, students will study cutting-edge science and engineering research and discuss the latest trends in the subject areas. After taking the course, study and study the relevant field in detail.

●Textbook

Distribute as appropriate.

●Additional Reading

Distribute as appropriate.

●Grade Assessment

Report. A score of 60 or more out of 100 will be passed. Pass if you have a broad understanding of the subject area. Highly appreciate the point of contact with your own research, new business and research

proposals.

●Notes

There are no special requirements. Students who are interested in startups are preferred.

●Contacting Faculty

Arranging the schedules by e-mail and etc.

Advanced Experiments for Frontier Technologies and Sciences (1.0credits) (最先端理工学実験)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Experiment		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	
Lecturer	Manato DEKI Associate Professor		

●Course Purpose

To research in advanced engineering, it is necessary to learn the latest research trends through practice. The purpose of this experiment is to find the research issues on one's own and conduct research experiments using the latest experimental equipment and molecular simulation technology.
Through this experiment, you will be able to understand the principles of the Raman spectrometer, ionization potential measurement, X-ray diffraction etc. and molecular simulation software and learn how to use them practically. The goal is to comprehensively acquire the knowledge, skills, and presentation techniques related to advanced experiments necessary for conducting the research that was the subject.

●Prerequisite Subjects

it is advisable to acquire basic knowledge on the subject research.

●Course Topics

When students choose the prepared subject, students perform the curriculum using one of a Raman spectrometer, an ionization potential measurement and an X-ray diffractometer and learn the principles and practical and advanced usage of these equipment. In the case of an experiment proposed by students (original experiment), students proposes a molecular simulation experiment or research using the above-described equipment, and conduct the experiment with the instructor to produce results. Ultimately, students discuss the results, present their results, and learn how to use the advanced equipment and simulation skills.

●Textbook

Distribute as needed. Please check the required documents by yourself.

●Additional Reading

Distribute as needed. Please check the required documents by yourself.

●Grade Assessment

Exercise (50%) and presentation of research results (50%) will be evaluated. Understanding the measurement principle and usage is used as a criterion for acceptance, but the research achievements and new approaches to research are highly evaluated. A score of 60 or more out of 100 is a passing score.

●Notes

No course requirements.

●Contacting Faculty

Arranging the schedules by e-mail and etc.

Introduction to Academic Communication (1.0credits) (コミュニケーション学)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	Graduate Chemistry
	Automotive Engineering	Automotive Engineering	Civil and Environmental Engineering Graduate
	Physical Engineering Graduate		
Starts 1	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester		
Lecturer	ReikoFURUYA Associate Professor		

●Course Purpose

Students will learn presentation skills for academic purposes, which may include giving academic presentations.
Japanese students are expected to present in English and international students in Japanese in the seventh or eighth class meeting.
By taking this class, students are expected to be able to do the following:
-Give a solid presentation with confidence and without hesitance
-Grasp the characteristics of successful presentations
-Use techniques learned in class in their own presentation

●Prerequisite Subjects

English language classes for Japanese students
Japanese language classes for international students

●Course Topics

(1) Ways to convey messages in presentation
(2) The language of a presentation
(3) Tips for making effective slides
(4) Observation and analysis of video-taped presentation by a past student
(5) Paper vs presentation
(6) Preparation for individual presentation

(7) Individual presentations I
(8) Individual presentations

This course requires students to work outside of the classes for individual presentation.

●Textbook

Handouts will be distributed in class

●Additional Reading

1The Japan Times
2:

●Grade Assessment

Individual presentation: 50%
Active class participation: 50%

Grades: A+: 100%-95%, A: 94%-80%, B: 79%-70%, C: 69%-65%, C-: 64%-60%, F: 59%-0%

Grading will be decided based on the ability to give an effective academic presentation.

●Notes

There are no requirements for taking this class.

●Contacting Faculty

Questions will be answered before class, in class, after class or by e-mail.

Latest Advanced Technology and Tasks in Automobile Engineering (3.0credits) (先端自動車工学特論)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	Automotive Engineering
	Automotive Engineering		
Starts 1	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester		
Lecturer	Yasuhiko SAKAI Designated Professor		

●Course Purpose

This course is intended to study the latest advanced technology of automobile engineering from top researchers of universities and industries. The topics of lectures are related to almost all fields of automotive industries, such as hibrid cars, electric cars, automated driving and crash safety. It is asle intended to develop the English hearing/speaking ability. The attainment targets are as follows:

1. Understand the latest technology of automotive engineering.
2. Underatand company's automotive production system.
3. Improve English ability in the field of socience and engineering.
4. Strengthen communication skills and presentation skills in English by studying with international students.

●Prerequisite Subjects

lectures related to fundamental physics, mechanical, electrical and information engineering.

●Course Topics

A. Lectures

1. The Car Industry, Market Trend, Circumstance and Its Future.
2. Overview of Automotive Development Process.
3. Observation and Evaluation of Drivers' Behavior Perspective.
4. Car Materials and Processing.
5. Movements and Control of a Car.
6. Safety Engineering for the Prevention of Accidents.
7. Crash Safety.
8. Automobile Embedded Computing System.
9. Wireless Technologies in ITS.

10.Applications of CAE to Vehicle Development.
11.Energy Saving Technology for Automobiles.
12.Automated Driving.
13.Traffic Flow Characteristics.
14.Cars and Roads in Urban Transportation Context.
15.Automobile in Aging Society.
B. Factory Visits
1.Toyota Motors Corp., 2. Mitsubishi Motors Corp., 3. Toyota Boshoku Corp., 4.Suzuki Museum,
5.Toyota Commemorative Museum, 6. Traffic Safety and Environmental Lab.
C. Group Research Project
Several students form one group and each group selects one topic. They investigate and discuss about this topic and make presentations.
After each lecture is finished, read the handout and write a repor about each lecture with your comments.

●Textbook

Handout delivered in each lecture

●Additional Reading

Introduced in the lectures

●Grade Assessment

Evaluation will be based on (a) Discussions in the lectures 20%, (b) report for each lecture 20%, (c) group presentation 30%. and (d) report on research subject 30%. It is necessary to attend factory visits.In each item, the undastanding of the concepts is especially evaluated.
Summing up the all scores from (a) to (d) and the students with evaluation A, B, or C can pass this subject.

●Notes

1. There are limits of enrollment capacity.Full course student limit is about 10.Auditor limit for each lecture is about 10.
2. English ability is checked before accepted as a student.

●Contacting Faculty

Mainly accepted during each lecture. Other general questions are accepted by Professor Yukio Ishida.
<Contact> TEL: 052-747-6797, Email: ishida@nuem.nagoya-u.ac.jp

Advanced Lectures on Scientific English (1.0credits) (科学技術英語特論)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	Automotive Engineering
	Automotive Engineering	Civil and Environmental Engineering Graduate	Physical Engineering Graduate
Starts 1	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
Lecturer	Part-time Faculty		

●Course Purpose

This is a course to acquire basic skills to summarize research as a paper in English. By the end of the course, students will be able to …
explain the basic structure of science and technology research paper
list essential components of each section of research paper
type short multiple-paragraph essays with appropriate punctuation
orally express logically structured opinion

●Prerequisite Subjects

Various subjects relating to English

●Course Topics

1. Basics of academic writing in English (1)
2. Basic structure of science & technology research paper (1)
3. Writing (1), feedback and opinion exchange
4. Basics of academic writing in English (2)
5. Basic structure of science & technology research paper (2)
6. Writing (2), feedback and opinion exchange
7. Basic structure of science & technology research paper (3)
8. Writing (3), feedback and opinion exchange

Students are expected to spend a few hours each week reviewing key points of the lecture and working on the writing assignment.

●Textbook

None. Students will receive handouts in each class session.

●Additional Reading

Glasman-Deal, H. (2010). Science Research Writing For Non-Native Speakers of English. Imperial College Press.
Swales, J.M. & Feak, C.B. (2012). Academic Writing for Graduate Students. The University of Michigan Press.
Wallwork, A. (2013). English for Academic Research: Grammar, Usage and Style. Springer.
Wallwork, A. (2016). English for Writing Research Papers. Springer.

●Grade Assessment

Submitting three short writing assignments that show understanding of research paper structure with appropriate punctuation is required for a passing grade. Speaking English contributing to discussion and opinion exchange, as well as raising questions in class, is strongly encouraged.

●Notes

There are no prerequisites.

●Contacting Faculty

Email address to be announced in the first class

Focus on Venture Business I (2.0credits) (ベンチャービジネス特論 I)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester	1 Spring Semester	
Lecturer	Part-time Faculty	Manato DEKI Assistant Professor	

●Course Purpose

People often point out that the layer of startup companies should assume the leading edge is thin. Part of the cause depends on the system, but in many cases, it is due to the difference in perceptions of the entrepreneurship between East and Western researchers. In this course, you study the basic knowledge and goals required as engineers and researchers when commercializing/starting a “university research.” We will show examples of technology development and commercialization based on research results of universities, entrepreneurship in companies and venture startups, and consider venture business utilizing research. Through this lecture, entrepreneurs' mindsets will be formed as well as minimum knowledge of patents.

●Prerequisite Subjects

●Course Topics

●Textbook

Distribute materials as appropriate.

●Additional Reading

●Grade Assessment

Evaluate based on self-made problem report Understanding the problems and solutions for startups that respond to the problems in the lecture is a criterion for success. The contents of the report are comprehensively evaluated, and a score of 60 or more is considered acceptable. New business proposals will be appreciated.

●Notes

Do not have any special requirements.We hope students who are interested in startups.

●Contacting Faculty

the break after the lecture.

Focus on Venture Business II (2.0credits) (ベンチャービジネス特論II)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	
Lecturer	Manato DEKI Assistant Professor		

●Course Purpose

By referring to the examples of commercialization, in-company entrepreneurship and venture entrepreneurship given in the special lecture on venture business I, you study the specialized knowledge necessary for entrepreneurship and start-up from a public accountant, SME consultant, etc. Talks are held with specialists in Japan to acquire the knowledge needed for venture business management.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Internship A (1.0credits) (学外実習Ａ)

Course Type	Comprehensive engineering courses
Division at course	Master's Course
Class Format	Practice
Course Name	Department of Energy Engineering
Starts 1	1 Spring and Autumn Semester
Lecturer	Associated Faculty

●Course Purpose

In the course of the internship program, students make research works concerning predetermined themes in research and developing sections of companies under the instructing staffs of the companies. Through the program, the students are expected to learn the practical ways of problem-setting and solving at the front of research and developing in the companies activities, and to have the wide knowledge of the practical aspects of the scientific and engineering fields they are studying in the university. Students learn collective strength and creativity.

●Prerequisite Subjects

●Course Topics

The theme of the student is determined under the agreement between the university and the company that cooperates in the internship program.

●Textbook

●Additional Reading

●Grade Assessment

Evaluation of the attainment of the student is made by the instructors of the company. Oral presentation and written report of the research results are also evaluated by the university staffs and company instructors.

●Notes

●Contacting Faculty

Internship B (1.0credits) (学外実習Ｂ)

Course Type	Comprehensive engineering courses
Division at course	Master's Course
Class Format	Practice
Course Name	Department of Energy Engineering
Starts 1	1 Spring and Autumn Semester
Lecturer	Associated Faculty

●Course Purpose

In the course of the internship program, students make research works concerning predetermined themes in research and developing sections of companies under the instructing staffs of the companies. Through the program, the students are expected to learn the practical ways of problem-setting and solving at the front of research and developing in the companies activities, and to have the wide knowledge of the practical aspects of the scientific and engineering fields they are studying in the university. Students learn collective strength and creativity.

●Prerequisite Subjects

●Course Topics

The theme of the student is determined under the agreement between the university and the company that cooperates in the internship program.

●Textbook

●Additional Reading

●Grade Assessment

Evaluation of the attainment of the student is made by the instructors of the company. Oral presentation and written report of the research results are also evaluated by the university staffs and company instructors.

●Notes

●Contacting Faculty

Overview of space exploration and research (2.0credits) (宇宙研究開発概論)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Process Engineering
	Chemical Systems Engineering	Electrical Engineering	Electronics
	Information and Communication Engineering	Mechanical Systems Engineering	Micro-Nano Mechanical Science and Engineering
	Aerospace Engineering	Department of Energy Engineering	Department of Applied Energy
	Civil and Environmental Engineering		
Starts 1	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester		
Lecturer	Leading Graduate		

●Course Purpose

This lecture course helps students to acquire a wide-ranging, panoramic knowledge of space research and development given by variety of lecturers from different academic fields.

●Prerequisite Subjects

Basic mathematics, Basic physics

●Course Topics

1. Space Exploration Projects
1.1 Overview of Space Exploration and Research
1.2 Space Projects
1.3 International Satellite and Spacecraft (HTV) Development
1.4 Project Management/Systems Engineering
1.5 Intelectual Properties in Business

2. Space Explorations on Observations
2.1 Space Propulsion Engineering
2.2 Materials Development for Space Applications
2.3 Space Observation Technologies
2.4 Introduction to Radiation Detectors and Electronics

3. Space-related Science
3.1 Foundations of Astrophysics
3.2 Earth and Planetary Science
3.3 Space Environment Science
3.4 Simulation Experiments

Report subject will be given at every lecture. The report should be submitted by the given deadline.

●Textbook

We do not specify the textbook. Lecture notes will be given as necessary.

●Additional Reading

Recommended readings will be give during lectures as necessary.

●Grade Assessment

Report must be submitted for each lecture. Proper understanding of each lecture's contents is evaluated. Passing average point is 60 out of 100.

●Notes

Students in "Leadership program for Space exploration and Research" are required to take this course before the qualifying examination.This course is open to any graduate students in Nagoya University.

●Contacting Faculty

Inquire contact method from the lecturer after the lecture

Advanced Lectures on Transdisciplinary Mobility Innovation I (2.0credits) (超学際移動イノベーション学特論 I)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	
Lecturer	Toshiyuki YAMAMOTO Professor	Faculty of TMI Program	

●Course Purpose

Through the lectures on various super-interdisciplinary mobility innovations for life-style transformation, learn the impacts and changes of life-style caused by the mobility innovations.
The ability to understand the mobility innovations from various perspectives, and to implement them based on the understandings from various disciplines are required to realize the life-style transformations by mobility innovations. The purposes of this class is to obtain the ability as below.
- understand the mobility innovations from various disciplines
- analyze the effects of and forecast the future of mobility innovations

●Prerequisite Subjects

Not required

●Course Topics

Through the lectures on super-interdisciplinary mobility innovations and life-style transformation, various environments and implementations of cutting-edge mobility innovations are discussed.

1. History of technologies on mobility
2. Service design of mobility
3. Product design theory
4. Mobility innovations and diversity
5. Theory on inclusive mobility

Report assignments on the contents explained in the lecture are given.

●Textbook

Materials are provided at classes.

●Additional Reading

Introduced according to the process of the lecture.

●Grade Assessment

Evaluated by reports.

●Notes

Not required.

●Contacting Faculty

Ask questions in the class. There are no fixed schedules for office hour. Make an appointment by e-mail or tel.

Yamamoto: 4636, yamamoto@civil.nagoya-u.ac.jp

Advanced Lectures on Transdisciplinary Mobility Innovation II (2.0credits) (超学際移動イノベーション学特論II)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	
Lecturer	Toshiyuki YAMAMOTO Professor	Faculty of TMI Program	

●Course Purpose

Through the practical lectures on various super-interdisciplinary mobility innovations for life-style transformation, learn more the impacts and changes of life-style caused by the mobility innovations.
The ability to understand the mobility innovations from various perspectives, and to implement them based on the understandings from various disciplines are required to realize the life-style transformations by mobility innovations. The purposes of this class is to obtain the ability as below.
- understand comprehensively the mobility innovations from various disciplines
- analyze deeper the effects of and forecast the future of mobility innovations

●Prerequisite Subjects

Advanced super-interdisciplinary mobility innovation I

●Course Topics

Through the lectures on more diverse super-interdisciplenary mobility innovations and life-style transformation, various environments and implementations of cutting-edge mobility innovations are discussed.

1. Cutting-edge mobility system
2. Ergonomics
3. Mobility and cognitive science
4. Mobility and society
5. Law and institutional design fro mobility

Report assignments on the contents explained in the lecture are given.

●Textbook

Materials are provided at classes.

●Additional Reading

Introduced according to the process of the lecture.

●Grade Assessment

Evaluated by reports.

●Notes

Not required.

●Contacting Faculty

Ask questions in the class. There are no fixed schedules for office hour. Make an appointment by e-mail or tel.

Yamamoto: 4636, yamamoto@civil.nagoya-u.ac.jp

Advanced Mobility Program Basic Course (4.0credits) (先進モビリティ学基礎)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Lecture and Exercise		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester	1 Spring Semester	1 Spring Semester
	1 Spring Semester	1 Spring Semester	
Lecturer	Faculty of Advanced Mobility Program		

●Course Purpose

To train students who can be active in the mobility industry or research institute. This course is aiming to cultivate comprehensive knowledge not only on specialized technical elements but also service and social impact of the mobility. The class will be provided not only by professors but also by engineers in industry. The course is organized as follows:

1. Understand fundamentals of automobile
2. Understand the trend on electrification of automobile
3. Understand the trend on on intelligence for automobile
4. Understand dependability, safety and human factor
5. Comprehensively study the mobility service
6. Comprehensively study the legal system for mobility

●Prerequisite Subjects

Accepted basic engineering classes at Nagoya University Bachelor's degree, or equivalent knowledge.

●Course Topics

1. Fundamentals of automobile
2. Electrification of automobile
3. Intelligence for automobile
4. Dependability, safety and human factor
5. Mobility service
6. Legal system for mobility
7. Discussion and presentation

Read carefully the textbook before attending each class. After each class, solving the exercises in the

textbook is highly recommended. Submission of the report after each class is mandatory.

●Textbook
Original lecture note will be provided.

●Additional Reading
It will be announced in the class if necessary.

●Grade Assessment
Evaluation is based on total score of reports at each class and final presentation. You need more than mark of 60 out of 100 points. Special certificate will be provided for passed students.

●Notes
No particular requirement.

●Contacting Faculty
Office hour:Wed.13:0014:00 @Green Vehicle Material Research Building 1F
Mail to: o_shimizu@nuem.nagoya-u.ac.jp

ced Mobility Program Practical Training Course(Autonomous Vehicle) (2.0credits) (先進モビリティ学実習（自動運

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Exercise and Practice		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	
Lecturer	Faculty of Advanced Mobility Program		

●Course Purpose

To train students who can be active in the mobility industry or research institute. This course is aiming to realization of autonomous drive by using 1/10 model car. Students develop the software system for autonomous driving. The course is organized as follows:

1. Understand architecture of autonomous drive
2. Understand the image processing for lane detection, and its implementation
3. Understand the control technique for lane following and its implementation

●Prerequisite Subjects

Accepted basic engineering classes at Nagoya University Bachelor's degree, or equivalent knowledge.

●Course Topics

This course is aiming to realization of autonomous drive by using 1/10 model car. Students develop the software system for autonomous driving. The course is organized as follows:

1. Architecture of autonomous drive
2. Image processing for lane detection, and its implementation
3. Control technique for lane following and its implementation

Class is performed based on group activity.

●Textbook

Original lecture note will be provided.

●Additional Reading

It will be announced in the class if necessary.

ced Mobility Program Practical Training Course(Autonomous Vehicle) (2.0credits) (先進モビリティ学実習（自動運

●Grade Assessment

Evaluate based on attendance at lecture, total score of tasks set at each time, final presentation. Special certificate will be provided for passed students.

●Notes

There are no prerequisites.

●Contacting Faculty

Office hour:Wed.13:0014:00 @Green Vehicle Material Research Building 1F
Mail to: o_shimizu@nuem.nagoya-u.ac.jp

dvanced Mobility Program Practical Training Course(Electric Vehicle) (2.0credits) (先進モビリティ学実習（ＥＶ）

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Exercise and Practice		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	1 Autumn Semester
	1 Autumn Semester	1 Autumn Semester	
Lecturer	Faculty of Advanced Mobility Program		

●Course Purpose

To train students who can be active in the mobility industry or research institute. This course is aiming to design and analysis of EV formula car. In addition, Test drive is carried out. The course is organized as follows:1. Understand the mechanism of electric vehicle2. Understand the characteristics of motor and battery3. Understand the way of analysis and design of vehicle

●Prerequisite Subjects

Accepted basic engineering classes at Nagoya University Bachelor's degree, or equivalent knowledge.

●Course Topics

This course is aiming to design and analysis of EV formula car. In addition, Test drive is carried out. The course is organized as follows:1. Mechanism of electric vehicle2. Characteristics of motor and battery3. Way of analysis and design of vehicle Class is performed based on group activity.

●Textbook

Original lecture note will be provided.

●Additional Reading

It will be announced in the class if necessary.

●Grade Assessment

Evaluate based on attendance at lecture, total score of tasks set at each time, final presentation. You need more than mark of 60 out of 100 points. Special certificate will be provided for passed students.

●Notes

There are no prerequisites.

●Contacting Faculty

Office hour:Wed.13:0014:00 @Green Vehicle Material Research Building 1FMail to: o_shimizu@nuem.nagoya-u.ac.jp

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	
Lecturer	Associated Faculty		

●Course Purpose

• To design and conduct an original research project
• To develop experience with experimental/numerical/theoretical techniques
• To develop a working knowledge of relevant research literature
• To practice scientific writing and participate in the peer review process
• To be able to discuss the research and topic with other scientists and engineers
The objective of this project is to increase the capability to find and to solve research problems by learning the research approaches and ideas of different research fields.

●Prerequisite Subjects

Basic engineering subjects, English, Technical English

●Course Topics

• Students will develop (with guidance) a research project proposal at the beginning of the semester that will provide initiative, outline and experimental strategy.
• Each student will present oral reports of research progress, relevant readings, and/or challenges at scheduled lab meetings.
• Students will take primary responsibility for conducting research and do so with professional attitudes and time commitments. This is a lab course and you are expected to spend a minimum of 20 hours of productive lab work per week. It is more realistic to expect to spend an average of 25-30 hours per week working and thinking about your project.
• Students will produce a manuscript (with active feedback from the instructor and peers) that can be published in part or whole by a peer reviewed research journal. Publishable manuscripts require many drafts,

reviews, and revisions.
• Students are encouraged to present research results at appropriate scientific meetings.
• Students well be self-motivated and work independently, approaching the instructor for guidance regularly.

●Textbook
Will be designated by each supervisor.

●Additional Reading
Will be designated by each supervisor.

●Grade Assessment
The grade will be calculated according to the following criteria.
Written report following the same format as scientific paper... 50%; Presentation at the Workshop... 50%.
The acceptance standard is to understand the introduced research approaches and ideas.
Evaluation is done by the supervisor(s) at home and visiting universities.

●Notes
No conditions for taking the course.

●Contacting Faculty
Supervisor of visiting university basically takes care.

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	
Lecturer	Associated Faculty		

●Course Purpose

• To design and conduct an original research project
• To develop experience with experimental/numerical/theoretical techniques
• To develop a working knowledge of relevant research literature
• To practice scientific writing and participate in the peer review process
• To be able to discuss the research and topic with other scientists and engineers
The objective of this project is to increase the capability to find and to solve research problems by learning the research approaches and ideas of different research fields.

●Prerequisite Subjects

Basic engineering subjects, English, Technical English

●Course Topics

• Students will develop (with guidance) a research project proposal at the beginning of the semester that will provide initiative, outline and experimental strategy.
• Each student will present oral reports of research progress, relevant readings, and/or challenges at scheduled lab meetings.
• Students will take primary responsibility for conducting research and do so with professional attitudes and time commitments. This is a lab course and you are expected to spend a minimum of 20 hours of productive lab work per week. It is more realistic to expect to spend an average of 25-30 hours per week working and thinking about your project.
• Students will produce a manuscript (with active feedback from the instructor and peers) that can be published in part or whole by a peer reviewed research journal. Publishable manuscripts require many drafts,

reviews, and revisions.
• Students are encouraged to present research results at appropriate scientific meetings.
• Students well be self-motivated and work independently, approaching the instructor for guidance regularly.

●Textbook

Will be designated by each supervisor.

●Additional Reading

Will be designated by each supervisor.

●Grade Assessment

The grade will be calculated according to the following criteria.
Written report following the same format as scientific paper... 50%; Presentation at the Workshop... 50%.
The acceptance standard is to understand the introduced research approaches and ideas.
Evaluation is done by the supervisor(s) at home and visiting universities.

●Notes

No conditions for taking the course.

●Contacting Faculty

Supervisor of visiting university basically takes care.

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	
Lecturer	Associated Faculty		

●Course Purpose

• To design and conduct an original research project
• To develop experience with experimental/numerical/theoretical techniques
• To develop a working knowledge of relevant research literature
• To practice scientific writing and participate in the peer review process
• To be able to discuss the research and topic with other scientists and engineers
The objective of this project is to increase the capability to find and to solve research problems by learning the research approaches and ideas of different research fields.

●Prerequisite Subjects

Basic engineering subjects, English, Technical English

●Course Topics

• Students will develop (with guidance) a research project proposal at the beginning of the semester that will provide initiative, outline and experimental strategy.
• Each student will present oral reports of research progress, relevant readings, and/or challenges at scheduled lab meetings.
• Students will take primary responsibility for conducting research and do so with professional attitudes and time commitments. This is a lab course and you are expected to spend a minimum of 20 hours of productive lab work per week. It is more realistic to expect to spend an average of 25-30 hours per week working and thinking about your project.
• Students will produce a manuscript (with active feedback from the instructor and peers) that can be published in part or whole by a peer reviewed research journal. Publishable manuscripts require many drafts,

reviews, and revisions.
• Students are encouraged to present research results at appropriate scientific meetings.
• Students well be self-motivated and work independently, approaching the instructor for guidance regularly.

●Textbook

Will be designated by each supervisor.

●Additional Reading

Will be designated by each supervisor.

●Grade Assessment

The grade will be calculated according to the following criteria.
Written report following the same format as scientific paper... 50%; Presentation at the Workshop... 50%.
The acceptance standard is to understand the introduced research approaches and ideas.
Evaluation is done by the supervisor(s) at home and visiting universities.

●Notes

No conditions for taking the course.

●Contacting Faculty

Supervisor of visiting university basically takes care.

International special lecture (1.0credits) (国際協働教育特別講義)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Process Engineering
	Chemical Systems Engineering	Electrical Engineering	Electronics
	Information and Communication Engineering	Mechanical Systems Engineering	Micro-Nano Mechanical Science and Engineering
	Aerospace Engineering	Department of Energy Engineering	Department of Applied Energy
	Civil and Environmental Engineering		
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester		
Lecturer	Associated Faculty		

●Course Purpose

Gain basic knowledge of general engineering through English lectures on various hot research topics and leading technologies. The objective of this lecture is to develop research abilities and communication skills, which are essential to carry out international collaborative researches.

●Prerequisite Subjects

Basic engineering subjects, English, Technical English

●Course Topics

Depends on the lecturer.This course will be divided in 4 chapters as follows:1. Setting theme and reviewing literature2. Designing research plan3. Analysis and discussion of results4. Brief summary and future prospectsHomework will be given after the class and the report is required to be submitted in next class.

●Textbook

Will be designated by the lecturer.

●Additional Reading

Will be designated by the lecturer.

●Grade Assessment

Written report and evaluation by the professors.

●Notes

No conditions for taking the course.

●Contacting Faculty

In the class and E-mail.

International language exercise (1.0credits) (国際協働教育外国語演習)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Exercise		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Process Engineering
	Chemical Systems Engineering	Electrical Engineering	Electronics
	Information and Communication Engineering	Mechanical Systems Engineering	Micro-Nano Mechanical Science and Engineering
	Aerospace Engineering	Department of Energy Engineering	Department of Applied Energy
	Civil and Environmental Engineering		
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester		
Lecturer	Associated Faculty		

●Course Purpose

The aim of this course is to provide Japanese students with the English classes or provide international students with Japanese classes to improve communication skills for both academic and daily life.

●Prerequisite Subjects

English, Technical English, Japanese

●Course Topics

Wide variety of exercises including speaking, listening, writing, reading, and presentation in Japanese/English.Homework will be given after the class and the report is required to be submitted in next class.

●Textbook

Will be designated by the lecturer.

●Additional Reading

Will be designated by the lecturer.

●Grade Assessment

Report, presentation, participation in discussionGrading will be based on understanding Japanese and English, and communication performance.

●Notes

No conditions for taking the course.

●Contacting Faculty

Acceptance and response in the class or through E-mail.

Energy Engineering Seminar 2A (2.0credits) (エネルギー理工学セミナー2A)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Department of Energy Engineering		
Starts 1	1 Spring Semester		
Lecturer	Takanori NAGASAKI Professor	TomoakiYAMADA Associate Professor	Junji YUHARA Associate Professor
	Masahito YOSHINO Assistant Professor		

●Course Purpose

This seminar deals with various topics in solid state physics, solid state chemistry and materials science. Using a standard textbook written in English, the students give lectures in turn and discuss each other about the contents. They are expected to deepen the understanding of the topics by presentation and discussion during the seminar. They are also expected to improve the skills of reading scientific and technical English.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Energy Engineering Seminar 2A (2.0credits) (エネルギー理工学セミナー2A)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	1 Spring Semester	
Lecturer	Jun ONOE Professor	Masato NAKAYA Associate Professor

●Course Purpose

This course is consist of a weekly seminar about presentation of research progress in the doctoral course. The aim of this course is to learn following abilities.(1) Ability to work on research and developments on the basis of wide viewpoints not only a particular field. (2) Ability to present and discuss the research results in the world.

●Prerequisite Subjects

Energy nanomaterials science

●Course Topics

We will discuss about next topics. (1) Structure, functionality, and properties of nanomaterials (nanocarbons, Metal–organic frameworks, nanoparticles, and functional thin films) (2) Development of methodologies and apparatus of Advased multiscale measurement of nanomaterials (3) Novel methodologies toward control of functionality of nanomaterials (4) Application of nanomaterials

●Textbook

Handouts will be provided.

●Additional Reading

●Grade Assessment

Next points are required.(1) Progress of doctoral reserach by an own effort on the basis of original ideas.(2) Importance of results can be explained in the recent science and technology. (3) Novel and specific next plan should be included in presentations.(4) Active discussion with students and researchers

●Notes

●Contacting Faculty

Respond at the seminor and the break time after the lecture or at office hours.

Energy Engineering Seminar 2A (2.0credits) (エネルギー理工学セミナー2A)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	1 Spring Semester	
Lecturer	Ayae Narutaki Professor	Rintaro TAKAHASHI Assistant Professor

●Course Purpose

The goal of this course for students is to acquire the following knowledge and abilities regarding soft materials at the end of class.

(1) To be able to understand and explain the contents of cutting-edge academic papers.
(2) To be able to construct a research plan to solve a problem.
(3) To improve the problem-solving ability to optimally conduct the research that the students are working on.
(4) To write an academic paper on the research that the students are working on.

●Prerequisite Subjects

Basic Chemistry, Physical Chemistry, Energy Materials Science, Condensed Matter Physics, Quantum Material Chemistry, Electromagnetism

●Course Topics

Based on a literature survey on the following contents, students will present and discuss the contents of cutting-edge academic papers or the contents of students' research at seminars.

(1) Synthesis, structure, function, and physical properties of soft materials (polymers, colloids, molecular assemblies, gels, etc.)
(2) Analytical method for clarifying the structure, physical properties, and functions of soft materials
(3) Methodology for designing the physical properties and functions of soft materials
(4) Application of soft materials to the energy field

●Textbook

Review articles and the latest research articles are introduced from time to time.

●Additional Reading

Ulf Wiel Gedde, Mikael S. Hedenqvist, Fundamental Polymer Science, Springer.

●Grade Assessment

The lecturers will comprehensively judge the content of presentations, questions and answers, and discussions of the students at the seminar. Based on the goals stated in "Course Purpose", if improvement of ability is recognized, students will be passed, and if more advanced ability is acquired, it will be reflected in the grade accordingly.

●Notes

Be fully prepared before making a presentation at the seminar.
As a general rule, seminars will be conducted by distance learning using ICT.

●Contacting Faculty

The lecturers accept questions at any time.

Energy Engineering Seminar 2A (2.0credits) (エネルギー理工学セミナー2A)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	1 Spring Semester	
Lecturer	Shinya YAGI Professor	Satoshi OGAWA Assistant Professor

●Course Purpose

The aim of this seminar is to understand the basic technical contents about the energy materials, environmental materials, X-ray spectroscopic measurement, and photoelectron spectroscopy measurement methods and physics through the lecture and discussion.

●Prerequisite Subjects

condensed matter theory, electronic structure in materials, quantum mechanics, electromagnetics theory, quantum chemistry, X-ray spectroscopy, instrument of synchrotron radiation

●Course Topics

In this seminar, the following contents will be covered in order to understand basic knowledge about surfaces and bulk, and to promote understanding of the principles, analysis and interpretation of analytical methods to clarifymaterial's structures and chemical bonding states.1: Surface and bulk2: Chemical bonding state3: Nano materials and environmental functional materials4: X-ray spectroscopy, photoelectron spectroscopy5: Various devices for synchrotron radiation facility

●Textbook

"Introduction to Solid State Physics", Kittel, Willy

●Additional Reading

Distribute necessary prints

●Grade Assessment

attendance and implementation of a problem

●Notes

nothing

●Contacting Faculty

e-mail: yagi.shinya@c.mbox.nagoya-u.ac.jpPhone: 052-747-6828

Energy Engineering Seminar 2A (2.0credits) (エネルギー理工学セミナー2A)

Course Type	Specialized Courses
Division at course	Doctor's Course
Class Format	Seminar
Course Name	Department of Energy Engineering
Starts 1	1 Spring Semester
Lecturer	Hideki TOMITA Associate Professor

●Course Purpose
Developing of abilities to find essential problems and their original solutions for some subjects related to the student's doctor thesis in the research field of quantum beam measurement

●Prerequisite Subjects
Seminar on Quantum Beam Measurement 1-A,B,C,D, Electromagnetism, Quantum Mechanics, Atomic Physics, Material Science, Fundamentals of Nuclear Radiation Measurement

●Course Topics
Report and discussion on the results obtained through investigating the reference books and papers, specifying the problems, finding the solution and making some analysis for an appropriate research subject related to the student's doctor thesis.

●Textbook
None

●Additional Reading
Reference papers related to quantum beam measurement selected from academic journals, such as IEEE Trans. Nucl.Sci., Nucl.Instrum.Meth., Rev.Sci.Instrum, etc.

●Grade Assessment
Oral Examinations
Grade point:
Pass mark is more than 60 points for full marks of 100 points.
(For students of Year 2020 entrance and later)
100-95:A+, 94-80:A, 79-70:B, 69-65:C, 64-60:C-, <59:F
(For students of Year 2019 entrance and earlier)
100-90:S, 89-80:A, 79-70:B, 69-60:C, <59:F

●Notes
None

Please contact the lecturer of the course.

●Contacting Faculty
The questions will be answered by e-mail.

Address: h-tomita(at)energy.nagoya-u.ac.jp
(Please replace (at) with @.)

Energy Engineering Seminar 2A (2.0credits) (エネルギー理工学セミナー2A)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	1 Spring Semester	
Lecturer	Michihiro SHIBATA Professor	Yasuaki KOJIMA Associate Professor

●Course Purpose

Reading and presentation by turns basic textbooks and related papers to advance development of the structure of the atomic nucleus and the experimental technique. Understanding about a research trend of the related field, moreover learning about its applicability.Application ability and the invention are put on through these studies. Specifically, the following things are studied. 1. understand and explain the elucidation technique of the nuclear structure by the radiation measurement 2. know a document of nuclear data and a web site necessary to an experiment and utilize appropriately.3. understand the basic thesis the nuclear structure and explain the contents.4understand explain widely about a radiation measurements.

●Prerequisite Subjects

Nuclear physics, Quantum mechanics, Radiation measurements

●Course Topics

1. Structure of atomic nuclei1-1. liquid drop model and shell model1-2. collective model and unified model2. Nuclear reaction2-1. Compound nuclei 2-2. Resonance3. Accelerator4. Radiation sources and radioisotope production 5. Radiation measurements and nuclear structure6. Utilization of Nuclear Data libraryShare a technical book or material about the above contents, translate the person in charge into Japanese beforehand, and show translations as well as explain the contents together at the session. Anyone but the person in charge understand the language.

●Textbook

introduce the textbooks in the beginning of the fiscal year

●Additional Reading

introduce books and thesis according to the progress.

●Grade Assessment

Goal attainment level is estimated by the degree of the oral announcement in a seminar, the question and answer to that and the participation in argument. The degree of the preparation and the degree of participation to the oral announcement, the question and answer and the argument are set to 50%, 30% and 20% respectively.

●Notes

No registration conditions required

●Contacting Faculty

in class or officeProf. SHIBATA, Michihiro ex.2569e-mail:i45329a@nucc.cc.nagoya-u.ac.jpAssoc. Prof. KOJIMA, Yasuakiex.2572e-mailkojima.yasuaki@f.mbox.nagoya-u.ac.jp

Energy Engineering Seminar 2A (2.0credits) (エネルギー理工学セミナー2A)

Course Type	Specialized Courses
Division at course	Doctor's Course
Class Format	Seminar
Course Name	Department of Energy Engineering
Starts 1	1 Spring Semester
Lecturer	Yoshiyuki TSUJI Professor

●Course Purpose

Learn the foundamental aspect of energy system.

●Prerequisite Subjects

●Course Topics

●Textbook

S.B.Pope, Turbulent Flow, Cambridge Univ. PressP.A.Davidson, Turbulence, Oxford Univ. Press Other references are served by hard copies.

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Energy Engineering Seminar 2A (2.0credits) (エネルギー理工学セミナー2A)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Department of Energy Engineering		
Starts 1	1 Spring Semester		
Lecturer	Kiyomasa WATANABE Professor	Eiji IKENAGA Associate Professor	Tatsuya Assistant Professor

●Course Purpose

Deep understanding of fundamental plasma science and engineering by referring the articles on the following topics: Plasma particle and heat transport, MHD stability of magnetized plasmas, edge plasma phenomena, plasma heating.Through the above methods, the student's skill of the presentation will be improved.Purpose1. Understand the contents of the articles on the MHD equilibrium and the coordinates.2. Understand the logic, idea, method and conclusion of the articles on the MHD equilibrium and the coordinates.3. Extract the logic, idea, method and conclusion of the articles and explain them to the other persons.

●Prerequisite Subjects

Fundamentals of plasma and fusion science

●Course Topics

Read articles in Journal club type class1.Charged particle motion in magnetized plasma 2.MHD(MagnetoHydroDynamics) model 3.MHD equilibrium, 4.Electromagnetism and coordinate systems

●Textbook

●Additional Reading

●Grade Assessment

oral examination and discussion

●Notes

There is no certificate to take this course.

●Contacting Faculty

Energy Engineering Seminar 2B (2.0credits) (エネルギー理工学セミナー2B)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Department of Energy Engineering		
Starts 1	1 Autumn Semester		
Lecturer	Takanori NAGASAKI Professor	TomoakiYAMADA Associate Professor	Junji YUHARA Associate Professor
	Masahito YOSHINO Assistant Professor		

●Course Purpose

This seminar deals with various topics in solid state physics, solid state chemistry and materials science. Using a standard textbook written in English, the students give lectures in turn and discuss each other about the contents. They are expected to deepen the understanding of the topics by presentation and discussion during the seminar. They are also expected to improve the skills of reading scientific and technical English.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Energy Engineering Seminar 2B (2.0credits) (エネルギー理工学セミナー2B)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Department of Energy Engineering		
Starts 1	1 Autumn Semester		
Lecturer	Jun ONOE Professor	Masato NAKAYA Associate Professor	Shinta WATANABE Assistant Professor

●Course Purpose

This course is consist of a weekly seminar about presentation of research progress in the doctoral course. The aim of this course is to learn following abilities.(1) Ability to work on research and developments on the basis of wide viewpoints not only a particular field. (2) Ability to present and discuss the research results in the world.

●Prerequisite Subjects

Energy nanomaterials scienceEnergy Engineering Seminar 2A

●Course Topics

We will discuss about next topics. (1) Structure, functionality, and properties of nanomaterials (nanocarbons, Metal–organic frameworks, nanoparticles, and functional thin films) (2) Development of methodologies and apparatus of Advased multiscale measurement of nanomaterials (3) Novel methodologies toward control of functionality of nanomaterials (4) Application of nanomaterials

●Textbook

Handouts will be provided.

●Additional Reading

●Grade Assessment

Next points are required.(1) Progress of doctoral reserach by an own effort on the basis of original ideas.(2) Importance of results can be explained in the recent science and technology. (3) Novel and specific next plan should be included in presentations.(4) Active discussion with students and researchers

●Notes

●Contacting Faculty

Respond at the seminor and the break time after the lecture or at office hours.

Energy Engineering Seminar 2B (2.0credits) (エネルギー理工学セミナー2B)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	1 Autumn Semester	
Lecturer	Ayae Narutaki Professor	Rintaro TAKAHASHI Assistant Professor

●Course Purpose

The goal of this course for students is to acquire the following knowledge and abilities regarding soft materials at the end of class.

(1) To be able to understand and explain the contents of cutting-edge academic papers.
(2) To be able to construct a research plan to solve a problem.
(3) To improve the problem-solving ability to optimally conduct the research that the students are working on.
(4) To write an academic paper on the research that the students are working on.

●Prerequisite Subjects

Basic Chemistry, Physical Chemistry, Energy Materials Science, Condensed Matter Physics, Quantum Material Chemistry, Electromagnetism

●Course Topics

Based on a literature survey on the following contents, students will present and discuss the contents of cutting-edge academic papers or the contents of students' research at seminars.

(1) Synthesis, structure, function, and physical properties of soft materials (polymers, colloids, molecular assemblies, gels, etc.)
(2) Analytical method for clarifying the structure, physical properties, and functions of soft materials
(3) Methodology for designing the physical properties and functions of soft materials
(4) Application of soft materials to the energy field

●Textbook

Review articles and the latest research articles are introduced from time to time.

●Additional Reading

Ulf Wiel Gedde, Mikael S. Hedenqvist, Fundamental Polymer Science, Springer.

●Grade Assessment

The lecturers will comprehensively judge the content of presentations, questions and answers, and discussions of the students at the seminar. Based on the goals stated in "Course Purpose", if improvement of ability is recognized, students will be passed, and if more advanced ability is acquired, it will be reflected in the grade accordingly.

●Notes

Be fully prepared before making a presentation at the seminar.
As a general rule, seminars will be conducted by distance learning using ICT.

●Contacting Faculty

The lecturers accept questions at any time.

Energy Engineering Seminar 2B (2.0credits) (エネルギー理工学セミナー2B)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	1 Autumn Semester	
Lecturer	Shinya YAGI Professor	Satoshi OGAWA Assistant Professor

●Course Purpose
The aim of this seminar is to understand the basic technical contents about the energy materials, environmental materials, X-ray spectroscopic measurement, and photoelectron spectroscopy measurement methods and physics through the lecture and discussion.

●Prerequisite Subjects
depend on the technical contents in each laboratory

●Course Topics
In this seminar, the following contents will be covered in order to understand basic knowledge about surfaces and bulk, and to promote understanding of the principles, analysis and interpretation of analytical methods to clarifymaterial's structures and chemical bonding states.1: Surface and bulk2: Chemical bonding state3: Nano materials and environmental functional materials4: X-ray spectroscopy, photoelectron spectroscopy5: Various devices for synchrotron radiation facility

●Textbook
"Introduction to Solid State Physics", Kittel, Willy

●Additional Reading
Distribute necessary prints

●Grade Assessment
attendance and implementation of a problem

●Notes
nothing

●Contacting Faculty
e-mail: yagi.shinya@c.mbox.nagoya-u.ac.jpPhone: 052-747-6828

Energy Engineering Seminar 2B (2.0credits) (エネルギー理工学セミナー2B)

Course Type	Specialized Courses
Division at course	Doctor's Course
Class Format	Seminar
Course Name	Department of Energy Engineering
Starts 1	1 Autumn Semester
Lecturer	Hideki TOMITA Associate Professor

●Course Purpose
Developing of abilities to find essential problems and their original solutions for some subjects related to the student's doctor thesis in the research field of quantum beam measurement

●Prerequisite Subjects
Seminar on Quantum Beam Measurement 1-A,B,C,D, Electromagnetism, Quantum Mechanics, Atomic Physics, Material Science, Fundamentals of Nuclear Radiation Measurement

●Course Topics
Report and discussion on the results obtained through investigating the reference books and papers, specifying the problems, finding the solution and making some analysis for an appropriate research subject related to the student's doctor thesis.

●Textbook
None

●Additional Reading
Reference papers related to quantum beam measurement selected from academic journals, such as IEEE Trans. Nucl.Sci., Nucl.Instrum.Meth., Rev.Sci.Instrum, etc.

●Grade Assessment
Oral Examinations
Grade point:
Pass mark is more than 60 points for full marks of 100 points.
(For students of Year 2020 entrance and later)
100-95:A+, 94-80:A, 79-70:B, 69-65:C, 64-60:C-, <59:F
(For students of Year 2019 entrance and earlier)
100-90:S, 89-80:A, 79-70:B, 69-60:C, <59:F

●Notes
None

Please contact the lecturer of the course.

●Contacting Faculty
The questions will be answered by e-mail.

Address: h-tomita(at)energy.nagoya-u.ac.jp
(Please replace (at) with @.)

Energy Engineering Seminar 2B (2.0credits) (エネルギー理工学セミナー2B)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	1 Autumn Semester	
Lecturer	Michihiro SHIBATA Professor	Yasuaki KOJIMA Associate Professor

●Course Purpose

Reading and presentation by turns basic textbooks and related papers to advance development of the structure of the atomic nucleus and the experimental technique. Understanding about a research trend of the related field, moreover learning about its applicability.Application ability and the invention are put on through these studies. Specifically, the following things are studied. 1. understand and explain the elucidation technique of the nuclear structure by the radiation measurement 2. know a document of nuclear data and a web site necessary to an experiment and utilize appropriately.3. understand the basic thesis the nuclear structure and explain the contents.4understand explain widely about a radiation measurements.

●Prerequisite Subjects

Nuclear physics, Quantum mechanics, Radiation measurements

●Course Topics

1. Structure of atomic nuclei1-1. liquid drop model and shell model1-2. collective model and unified model2. Nuclear reaction2-1. Compound nuclei 2-2. Resonance3. Accelerator4. Radiation sources and radioisotope production 5. Radiation measurements and nuclear structure6. Utilization of Nuclear Data libraryShare a technical book or material about the above contents, translate the person in charge into Japanese beforehand, and show translations as well as explain the contents together at the session. Anyone but the person in charge understand the language.

●Textbook

introduce the textbooks in the beginning of the fiscal year

●Additional Reading

introduce books and thesis according to the progress.

●Grade Assessment

Goal attainment level is estimated by the degree of the oral announcement in a seminar, the question and answer to that and the participation in argument. The degree of the preparation and the degree of participation to the oral announcement, the question and answer and the argument are set to 50%, 30% and 20% respectively.

●Notes

No registration conditions required

●Contacting Faculty

in class or officeProf. SHIBATA, Michihiro ex.2569e-mail:i45329a@nucc.cc.nagoya-u.ac.jpAssoc. Prof. KOJIMA, Yasuakiex.2572e-mailkojima.yasuaki@f.mbox.nagoya-u.ac.jp

Energy Engineering Seminar 2B (2.0credits) (エネルギー理工学セミナー2B)

Course Type	Specialized Courses
Division at course	Doctor's Course
Class Format	Seminar
Course Name	Department of Energy Engineering
Starts 1	1 Autumn Semester
Lecturer	Yoshiyuki TSUJI Professor

●Course Purpose

Learn the foundamental aspect of energy system.

●Prerequisite Subjects

●Course Topics

●Textbook

S.B.Pope, Turbulent Flow, Cambridge Univ. PressP.A.Davidson, Turbulence, Oxford Univ. Press Other references are served by hard copies.

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Energy Engineering Seminar 2B (2.0credits) (エネルギー理工学セミナー2B)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Department of Energy Engineering		
Starts 1	1 Autumn Semester		
Lecturer	Kiyomasa WATANABE Professor	Eiji IKENAGA Associate Professor	Tatsuya Assistant Professor

●Course Purpose

Deep understanding of fundamental plasma science and engineering by referring the articles on the following topics: Plasma particle and heat transport, MHD stability of magnetized plasmas, edge plasma phenomena, plasma heating.Through the above methods, the student's skill of the presentation will be improved.Purpose1. Understand the contents of the articles on the MHD instability.2. Understand the logic, idea, method and conclusion of the articles on the MHD instability.3. Extract the logic, idea, method and conclusion of the articles and explain them to the other persons.

●Prerequisite Subjects

Fundamentals of plasma and fusion science

●Course Topics

Read articles in Journal club type class1.Distribution function, 2.Ideal MHD(MagnetoHydroDynamics) instabilities, 3.Resistive MHD instabilities

●Textbook

●Additional Reading

●Grade Assessment

oral examination and discussion

●Notes

There is no certificate to take this course.

●Contacting Faculty

Energy Engineering Seminar 2C (2.0credits) (エネルギー理工学セミナー2C)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Department of Energy Engineering		
Starts 1	2 Spring Semester		
Lecturer	Takanori NAGASAKI Professor	TomoakiYAMADA Associate Professor	Junji YUHARA Associate Professor
	Masahito YOSHINO Assistant Professor		

●Course Purpose

This seminar deals with various topics in solid state physics, solid state chemistry and materials science. Using a standard textbook written in English, the students give lectures in turn and discuss each other about the contents. They are expected to deepen the understanding of the topics by presentation and discussion during the seminar. They are also expected to improve the skills of reading scientific and technical English.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Energy Engineering Seminar 2C (2.0credits) (エネルギー理工学セミナー2C)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Department of Energy Engineering		
Starts 1	2 Spring Semester		
Lecturer	Jun ONOE Professor	Masato NAKAYA Associate Professor	Shinta WATANABE Assistant Professor

●Course Purpose

This course is consist of a weekly seminar about presentation of research progress in the doctoral course. The aim of this course is to learn following abilities.(1) Ability to work on research and developments on the basis of wide viewpoints not only a particular field. (2) Ability to present and discuss the research results in the world.

●Prerequisite Subjects

Energy nanomaterials scienceEnergy Engineering Seminar 2AEnergy Engineering Seminar 2B

●Course Topics

We will discuss about next topics. (1) Structure, functionality, and properties of nanomaterials (nanocarbons, Metal–organic frameworks, nanoparticles, and functional thin films) (2) Development of methodologies and apparatus of Advased multiscale measurement of nanomaterials (3) Novel methodologies toward control of functionality of nanomaterials (4) Application of nanomaterials

●Textbook

Handouts will be provided.

●Additional Reading

●Grade Assessment

Next points are required.(1) Progress of doctoral reserach by an own effort on the basis of original ideas.(2) Importance of results can be explained in the recent science and technology. (3) Novel and specific next plan should be included in presentations.(4) Active discussion with students and researchers

●Notes

●Contacting Faculty

Respond at the seminor and the break time after the lecture or at office hours.Office: Building No.9(west wing), Room 419,Tel: 052-789-3785,E-mail: m-nakaya@energy.nagoya-u.ac.jp

Energy Engineering Seminar 2C (2.0credits) (エネルギー理工学セミナー2C)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	2 Spring Semester	
Lecturer	Ayae Narutaki Professor	Rintaro TAKAHASHI Assistant Professor

●Course Purpose

The goal of this course for students is to acquire the following knowledge and abilities regarding soft materials at the end of class.

(1) To be able to understand and explain the contents of cutting-edge academic papers.
(2) To be able to construct a research plan to solve a problem.
(3) To improve the problem-solving ability to optimally conduct the research that the students are working on.
(4) To write an academic paper on the research that the students are working on.

●Prerequisite Subjects

Basic Chemistry, Physical Chemistry, Energy Materials Science, Condensed Matter Physics, Quantum Material Chemistry, Electromagnetism

●Course Topics

Based on a literature survey on the following contents, students will present and discuss the contents of cutting-edge academic papers or the contents of students' research at seminars.

(1) Synthesis, structure, function, and physical properties of soft materials (polymers, colloids, molecular assemblies, gels, etc.)
(2) Analytical method for clarifying the structure, physical properties, and functions of soft materials
(3) Methodology for designing the physical properties and functions of soft materials
(4) Application of soft materials to the energy field

●Textbook

Review articles and the latest research articles are introduced from time to time.

●Additional Reading

Ulf Wiel Gedde, Mikael S. Hedenqvist, Fundamental Polymer Science, Springer.

●Grade Assessment

The lecturers will comprehensively judge the content of presentations, questions and answers, and discussions of the students at the seminar. Based on the goals stated in "Course Purpose", if improvement of ability is recognized, students will be passed, and if more advanced ability is acquired, it will be reflected in the grade accordingly.

●Notes

Be fully prepared before making a presentation at the seminar.
As a general rule, seminars will be conducted by distance learning using ICT.

●Contacting Faculty

The lecturers accept questions at any time.

Energy Engineering Seminar 2C (2.0credits) (エネルギー理工学セミナー2C)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	2 Spring Semester	
Lecturer	Shinya YAGI Professor	Satoshi OGAWA Assistant Professor

●Course Purpose

The aim of this seminar is to understand the basic technical contents about the energy materials, environmental materials, X-ray spectroscopic measurement, and photoelectron spectroscopy measurement methods and physics through the lecture and discussion.

●Prerequisite Subjects

condensed matter theory, electronic structure in materials, quantum mechanics, electromagnetics theory, quantum chemistry, X-ray spectroscopy, instrument of synchrotron radiation

●Course Topics

In this seminar, the following contents will be covered in order to understand basic knowledge about surfaces and bulk, and to promote understanding of the principles, analysis and interpretation of analytical methods to clarifymaterial's structures and chemical bonding states.1: Surface and bulk2: Chemical bonding state3: Nano materials and environmental functional materials4: X-ray spectroscopy, photoelectron spectroscopy5: Various devices for synchrotron radiation facility

●Textbook

"Introduction to Solid State Physics", Kittel, Willy

●Additional Reading

Distribute necessary prints

●Grade Assessment

attendance and implementation of a problem

●Notes

nothing

●Contacting Faculty

e-mail: yagi.shinya@c.mbox.nagoya-u.ac.jpPhone: 052-747-6828

Energy Engineering Seminar 2C (2.0credits) (エネルギー理工学セミナー2C)

Course Type	Specialized Courses
Division at course	Doctor's Course
Class Format	Seminar
Course Name	Department of Energy Engineering
Starts 1	2 Spring Semester
Lecturer	Hideki TOMITA Associate Professor

●Course Purpose
Developing of abilities to find essential problems and their original solutions for some subjects related to the student's doctor thesis in the research field of quantum beam measurement

●Prerequisite Subjects
Seminar on Quantum Beam Measurement 1-A,B,C,D, Electromagnetism, Quantum Mechanics, Atomic Physics, Material Science, Fundamentals of Nuclear Radiation Measurement

●Course Topics
Report and discussion on the results obtained through investigating the reference books and papers, specifying the problems, finding the solution and making some analysis for an appropriate research subject related to the student's doctor thesis.

●Textbook
None

●Additional Reading
Reference papers related to quantum beam measurement selected from academic journals, such as IEEE Trans. Nucl.Sci., Nucl.Instrum.Meth., Rev.Sci.Instrum, etc.

●Grade Assessment
Oral Examinations
Grade point:
Pass mark is more than 60 points for full marks of 100 points.
(For students of Year 2020 entrance and later)
100-95:A+, 94-80:A, 79-70:B, 69-65:C, 64-60:C-, <59:F
(For students of Year 2019 entrance and earlier)
100-90:S, 89-80:A, 79-70:B, 69-60:C, <59:F

●Notes
None

Please contact the lecturer of the course.

●Contacting Faculty
The questions will be answered by e-mail.

Address: h-tomita(at)energy.nagoya-u.ac.jp
(Please replace (at) with @.)

Energy Engineering Seminar 2C (2.0credits) (エネルギー理工学セミナー2C)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	2 Spring Semester	
Lecturer	Michihiro SHIBATA Professor	Yasuaki KOJIMA Associate Professor

●Course Purpose

Reading and presentation by turns basic textbooks and related papers to advance development of the structure of the atomic nucleus and the experimental technique. Understanding about a research trend of the related field, moreover learning about its applicability.Application ability and the invention are put on through these studies. Specifically, the following things are studied. 1. understand and explain the elucidation technique of the nuclear structure by the radiation measurement 2. know a document of nuclear data and a web site necessary to an experiment and utilize appropriately.3. understand the basic thesis the nuclear structure and explain the contents.4understand other experimental technique for nuclear structure

●Prerequisite Subjects

Nuclear physics, Quantum mechanics, Radiation measurements

●Course Topics

1. Structure of atomic nuclei1-1. liquid drop model and shell model1-2. collective model and unified model2. Nuclear reaction2-1. Compound nuclei 2-2. Resonance3. Accelerator4. Radiation sources and radioisotope production 5. Radiation measurements and nuclear structure6. Utilization of Nuclear Data libraryShare a technical book or material about the above contents, translate the person in charge into Japanese beforehand, and show translations as well as explain the contents together at the session. Anyone but the person in charge understand the language.7. Other research methods for atomic nucleus structure except for radiation measurements.

●Textbook

introduce the textbooks in the beginning of the fiscal year

●Additional Reading

introduce books and thesis according to the progress.

●Grade Assessment

Goal attainment level is estimated by the degree of the oral announcement in a seminar, the question and answer to that and the participation in argument. The degree of the preparation and the degree of participation to the oral announcement, the question and answer and the argument are set to 50%, 30% and 20% respectively.

●Notes

No registration conditions required

●Contacting Faculty

in class or officeProf. SHIBATA, Michihiro ex.2569e-mail:i45329a@nucc.cc.nagoya-u.ac.jpAssoc. Prof. KOJIMA, Yasuakiex.2572e-mailkojima.yasuaki@f.mbox.nagoya-u.ac.jp

Energy Engineering Seminar 2C (2.0credits) (エネルギー理工学セミナー2C)

Course Type	Specialized Courses
Division at course	Doctor's Course
Class Format	Seminar
Course Name	Department of Energy Engineering
Starts 1	2 Spring Semester
Lecturer	Yoshiyuki TSUJI Professor

●Course Purpose

Learn the foundamental aspect of energy system.

●Prerequisite Subjects

●Course Topics

●Textbook

S.B.Pope, Turbulent Flow, Cambridge Univ. PressP.A.Davidson, Turbulence, Oxford Univ. Press Other references are served by hard copies.

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Energy Engineering Seminar 2C (2.0credits) (エネルギー理工学セミナー2C)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Department of Energy Engineering		
Starts 1	2 Spring Semester		
Lecturer	Kiyomasa WATANABE Professor	Eiji IKENAGA Associate Professor	Tatsuya Assistant Professor

●Course Purpose

Deep understanding of fundamental plasma science and engineering by referring the articles on the following topics: Plasma particle and heat transport, MHD stability of magnetized plasmas, edge plasma phenomena, plasma heating.Through the above methods, the student's skill of the presentation will be improved.Purpose1. Understand the contents of the articles on the MHD instability control.2. Understand the logic, idea, method and conclusion of the articles on the MHD instability control.3. Extract the logic, idea, method and conclusion of the articles and explain them to the other persons.

●Prerequisite Subjects

Fundamentals of plasma and fusion science

●Course Topics

Read articles in Journal club type classControl of MHD(MagnetoHydroDynamics) equilibrium, instabilities and disruption

●Textbook

●Additional Reading

●Grade Assessment

oral examination and discussion

●Notes

There is no certificate to take this course.

●Contacting Faculty

Energy Engineering Seminar 2D (2.0credits) (エネルギー理工学セミナー2D)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Department of Energy Engineering		
Starts 1	2 Autumn Semester		
Lecturer	Takanori NAGASAKI Professor	TomoakiYAMADA Associate Professor	Junji YUHARA Associate Professor
	Masahito YOSHINO Assistant Professor		

●Course Purpose

This seminar deals with various topics in solid state physics, solid state chemistry and materials science. Using a standard textbook written in English, the students give lectures in turn and discuss each other about the contents. They are expected to deepen the understanding of the topics by presentation and discussion during the seminar. They are also expected to improve the skills of reading scientific and technical English.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Energy Engineering Seminar 2D (2.0credits) (エネルギー理工学セミナー2D)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Department of Energy Engineering		
Starts 1	2 Autumn Semester		
Lecturer	Jun ONOE Professor	Masato NAKAYA Associate Professor	Shinta WATANABE Assistant Professor

●Course Purpose

This course is consist of a weekly seminar about presentation of research progress in the doctoral course. The aim of this course is to learn following abilities.(1) Ability to work on research and developments on the basis of wide viewpoints not only a particular field. (2) Ability to present and discuss the research results in the world.

●Prerequisite Subjects

Energy nanomaterials scienceEnergy Engineering Seminar 2AEnergy Engineering Seminar 2BEnergy Engineering Seminar 2C

●Course Topics

We will discuss about next topics. (1) Structure, functionality, and properties of nanomaterials (nanocarbons, Metal–organic frameworks, nanoparticles, and functional thin films) (2) Development of methodologies and apparatus of Advased multiscale measurement of nanomaterials (3) Novel methodologies toward control of functionality of nanomaterials (4) Application of nanomaterials

●Textbook

Handouts will be provided.

●Additional Reading

●Grade Assessment

Next points are required.(1) Progress of doctoral reserach by an own effort on the basis of original ideas.(2) Importance of results can be explained in the recent science and technology. (3) Novel and specific next plan should be included in presentations.(4) Active discussion with students and researchers

●Notes

●Contacting Faculty

Respond at the seminor and the break time after the lecture or at office hours.

Energy Engineering Seminar 2D (2.0credits) (エネルギー理工学セミナー2D)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	2 Autumn Semester	
Lecturer	Ayae Narutaki Professor	Rintaro TAKAHASHI Assistant Professor

●Course Purpose

The goal of this course for students is to acquire the following knowledge and abilities regarding soft materials at the end of class.

(1) To be able to understand and explain the contents of cutting-edge academic papers.
(2) To be able to construct a research plan to solve a problem.
(3) To improve the problem-solving ability to optimally conduct the research that the students are working on.
(4) To write an academic paper on the research that the students are working on.

●Prerequisite Subjects

Basic Chemistry, Physical Chemistry, Energy Materials Science, Condensed Matter Physics, Quantum Material Chemistry, Electromagnetism

●Course Topics

Based on a literature survey on the following contents, students will present and discuss the contents of cutting-edge academic papers or the contents of students' research at seminars.

(1) Synthesis, structure, function, and physical properties of soft materials (polymers, colloids, molecular assemblies, gels, etc.)
(2) Analytical method for clarifying the structure, physical properties, and functions of soft materials
(3) Methodology for designing the physical properties and functions of soft materials
(4) Application of soft materials to the energy field

●Textbook

Review articles and the latest research articles are introduced from time to time.

●Additional Reading

Ulf Wiel Gedde, Mikael S. Hedenqvist, Fundamental Polymer Science, Springer.

●Grade Assessment

The lecturers will comprehensively judge the content of presentations, questions and answers, and discussions of the students at the seminar. Based on the goals stated in "Course Purpose", if improvement of ability is recognized, students will be passed, and if more advanced ability is acquired, it will be reflected in the grade accordingly.

●Notes

Be fully prepared before making a presentation at the seminar.
As a general rule, seminars will be conducted by distance learning using ICT.

●Contacting Faculty

The lecturers accept questions at any time.

Energy Engineering Seminar 2D (2.0credits) (エネルギー理工学セミナー2D)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	2 Autumn Semester	
Lecturer	Shinya YAGI Professor	Satoshi OGAWA Assistant Professor

●Course Purpose

The aim of this seminar is to understand the basic technical contents about the energy materials, environmental materials, X-ray spectroscopic measurement, and photoelectron spectroscopy measurement methods and physics through the lecture and discussion.

●Prerequisite Subjects

condensed matter theory, electronic structure in materials, quantum mechanics, electromagnetics theory, quantum chemistry, X-ray spectroscopy, instrument of synchrotron radiation

●Course Topics

In this seminar, the following contents will be covered in order to understand basic knowledge about surfaces and bulk, and to promote understanding of the principles, analysis and interpretation of analytical methods to clarifymaterial's structures and chemical bonding states.1: Surface and bulk2: Chemical bonding state3: Nano materials and environmental functional materials4: X-ray spectroscopy, photoelectron spectroscopy5: Various devices for synchrotron radiation facility

●Textbook

"Introduction to Solid State Physics", Kittel, Willy

●Additional Reading

Distribute necessary prints

●Grade Assessment

attendance and implementation of a problem

●Notes

nothing

●Contacting Faculty

e-mail: yagi.shinya@c.mbox.nagoya-u.ac.jpPhone: 052-747-6828

Energy Engineering Seminar 2D (2.0credits) (エネルギー理工学セミナー2D)

Course Type	Specialized Courses
Division at course	Doctor's Course
Class Format	Seminar
Course Name	Department of Energy Engineering
Starts 1	2 Autumn Semester
Lecturer	Hideki TOMITA Associate Professor

●Course Purpose
Developing of abilities to find essential problems and their original solutions for some subjects related to the student's doctor thesis in the research field of quantum beam measurement

●Prerequisite Subjects
Seminar on Quantum Beam Measurement 1-A,B,C,D, Electromagnetism, Quantum Mechanics, Atomic Physics, Material Science, Fundamentals of Nuclear Radiation Measurement

●Course Topics
Report and discussion on the results obtained through investigating the reference books and papers, specifying the problems, finding the solution and making some analysis for an appropriate research subject related to the student's doctor thesis.

●Textbook
None

●Additional Reading
Reference papers related to quantum beam measurement selected from academic journals, such as IEEE Trans. Nucl.Sci., Nucl.Instrum.Meth., Rev.Sci.Instrum, etc.

●Grade Assessment
Oral Examinations
Grade point:
Pass mark is more than 60 points for full marks of 100 points.
(For students of Year 2020 entrance and later)
100-95:A+, 94-80:A, 79-70:B, 69-65:C, 64-60:C-, <59:F
(For students of Year 2019 entrance and earlier)
100-90:S, 89-80:A, 79-70:B, 69-60:C, <59:F

●Notes
None

Please contact the lecturer of the course.

●Contacting Faculty
The questions will be answered by e-mail.

Address: h-tomita(at)energy.nagoya-u.ac.jp
(Please replace (at) with @.)

Energy Engineering Seminar 2D (2.0credits) (エネルギー理工学セミナー2D)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	2 Autumn Semester	
Lecturer	Michihiro SHIBATA Professor	Yasuaki KOJIMA Associate Professor

●Course Purpose

Reading and presentation by turns basic textbooks and related papers to advance development of the structure of the atomic nucleus and the experimental technique. Understanding about a research trend of the related field, moreover learning about its applicability.Application ability and the invention are put on through these studies. Specifically, the following things are studied. 1. understand and explain the elucidation technique of the nuclear structure by the radiation measurement 2. know a document of nuclear data and a web site necessary to an experiment and utilize appropriately.3. understand the basic thesis the nuclear structure and explain the contents.4. understand and explain new radiation measurements technique.

●Prerequisite Subjects

Nuclear physics, Quantum mechanics, Radiation measurements

●Course Topics

1. Structure of atomic nuclei1-1. liquid drop model and shell model1-2. collective model and unified model2. Nuclear reaction2-1. Compound nuclei 2-2. Resonance3. Accelerator4. Radiation sources and radioisotope production 5. Radiation measurements and nuclear structure6. Utilization of Nuclear Data libraryShare a technical book or material about the above contents, translate the person in charge into Japanese beforehand, and show translations as well as explain the contents together at the session. Anyone but the person in charge understand the language.7. newly developed radiation detection technique

●Textbook

introduce the textbooks in the beginning of the fiscal year

●Additional Reading

introduce books and thesis according to the progress.

●Grade Assessment

Goal attainment level is estimated by the degree of the oral announcement in a seminar, the question and answer to that and the participation in argument. The degree of the preparation and the degree of participation to the oral announcement, the question and answer and the argument are set to 50%, 30% and 20% respectively.

●Notes

No registration conditions required

●Contacting Faculty

in class or officeProf. SHIBATA, Michihiro ex.2569e-mail:i45329a@nucc.cc.nagoya-u.ac.jpAssoc. Prof. KOJIMA, Yasuakiex.2572e-mailkojima.yasuaki@f.mbox.nagoya-u.ac.jp

Energy Engineering Seminar 2D (2.0credits) (エネルギー理工学セミナー2D)

Course Type	Specialized Courses
Division at course	Doctor's Course
Class Format	Seminar
Course Name	Department of Energy Engineering
Starts 1	2 Autumn Semester
Lecturer	Yoshiyuki TSUJI Professor

●Course Purpose

Learn the foundamental aspect of energy system.

●Prerequisite Subjects

●Course Topics

●Textbook

S.B.Pope, Turbulent Flow, Cambridge Univ. PressP.A.Davidson, Turbulence, Oxford Univ. Press Other references are served by hard copies.

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Energy Engineering Seminar 2D (2.0credits) (エネルギー理工学セミナー2D)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Department of Energy Engineering		
Starts 1	2 Autumn Semester		
Lecturer	Kiyomasa WATANABE Professor	Eiji IKENAGA Associate Professor	Tatsuya Assistant Professor

●Course Purpose

Deep understanding of fundamental plasma science and engineering by referring the articles on the following topics: Plasma particle and heat transport, MHD stability of magnetized plasmas, edge plasma phenomena, plasma heating.Through the above methods, the student's skill of the presentation will be improved.Purpose1. Understand the contents of the articles on the transport including turbulence.2. Understand the logic, idea, method and conclusion of the articles on the transport including turbulence.3. Extract the logic, idea, method and conclusion of the articles and explain them to the other persons.

●Prerequisite Subjects

Fundamentals of plasma and fusion science

●Course Topics

Read articles in Journal club type class1.Transport phenomena, 2.Diffusion and conduction in toroidal magnetized plasmas, 3.Turbulence driven transport

●Textbook

●Additional Reading

●Grade Assessment

oral examination and discussion

●Notes

There is no certificate to take this course.

●Contacting Faculty

Energy Engineering Seminar 2E (2.0credits) (エネルギー理工学セミナー2E)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Department of Energy Engineering		
Starts 1	3 Spring Semester		
Lecturer	Takanori NAGASAKI Professor	TomoakiYAMADA Associate Professor	Junji YUHARA Associate Professor
	Masahito YOSHINO Assistant Professor		

●Course Purpose

This seminar deals with various topics in solid state physics, solid state chemistry and materials science. Using a standard textbook written in English, the students give lectures in turn and discuss each other about the contents. They are expected to deepen the understanding of the topics by presentation and discussion during the seminar. They are also expected to improve the skills of reading scientific and technical English.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Energy Engineering Seminar 2E (2.0credits) (エネルギー理工学セミナー2E)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Department of Energy Engineering		
Starts 1	3 Spring Semester		
Lecturer	Jun ONOE Professor	Masato NAKAYA Associate Professor	Shinta WATANABE Assistant Professor

●Course Purpose

This course is consist of a weekly seminar about presentation of research progress in the doctoral course. The aim of this course is to learn following abilities.(1) Ability to work on research and developments on the basis of wide viewpoints not only a particular field. (2) Ability to present and discuss the research results in the world.

●Prerequisite Subjects

Energy nanomaterials scienceEnergy Engineering Seminar 2AEnergy Engineering Seminar 2BEnergy Engineering Seminar 2CEnergy Engineering Seminar 2D

●Course Topics

We will discuss about next topics. (1) Structure, functionality, and properties of nanomaterials (nanocarbons, Metal–organic frameworks, nanoparticles, and functional thin films) (2) Development of methodologies and apparatus of Advased multiscale measurement of nanomaterials (3) Novel methodologies toward control of functionality of nanomaterials (4) Application of nanomaterials

●Textbook

Handouts will be provided.

●Additional Reading

●Grade Assessment

Next points are required.(1) Progress of doctoral reserach by an own effort on the basis of original ideas.(2) Importance of results can be explained in the recent science and technology. (3) Novel and specific next plan should be included in presentations.(4) Active discussion with students and researchers

●Notes

●Contacting Faculty

Respond at the seminor and the break time after the lecture or at office hours.

Energy Engineering Seminar 2E (2.0credits) (エネルギー理工学セミナー2E)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	3 Spring Semester	
Lecturer	Ayae Narutaki Professor	Rintaro TAKAHASHI Assistant Professor

●Course Purpose

The goal of this course for students is to acquire the following knowledge and abilities regarding soft materials at the end of class.

(1) To be able to understand and explain the contents of cutting-edge academic papers.
(2) To be able to construct a research plan to solve a problem.
(3) To improve the problem-solving ability to optimally conduct the research that the students are working on.
(4) To write an academic paper on the research that the students are working on.

●Prerequisite Subjects

Basic Chemistry, Physical Chemistry, Energy Materials Science, Condensed Matter Physics, Quantum Material Chemistry, Electromagnetism

●Course Topics

Based on a literature survey on the following contents, students will present and discuss the contents of cutting-edge academic papers or the contents of students' research at seminars.

(1) Synthesis, structure, function, and physical properties of soft materials (polymers, colloids, molecular assemblies, gels, etc.)
(2) Analytical method for clarifying the structure, physical properties, and functions of soft materials
(3) Methodology for designing the physical properties and functions of soft materials
(4) Application of soft materials to the energy field

●Textbook

Review articles and the latest research articles are introduced from time to time.

●Additional Reading

Ulf Wiel Gedde, Mikael S. Hedenqvist, Fundamental Polymer Science, Springer.

●Grade Assessment

The lecturers will comprehensively judge the content of presentations, questions and answers, and discussions of the students at the seminar. Based on the goals stated in "Course Purpose", if improvement of ability is recognized, students will be passed, and if more advanced ability is acquired, it will be reflected in the grade accordingly.

●Notes

Be fully prepared before making a presentation at the seminar.
As a general rule, seminars will be conducted by distance learning using ICT.

●Contacting Faculty

The lecturers accept questions at any time.

Energy Engineering Seminar 2E (2.0credits) (エネルギー理工学セミナー2E)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	3 Spring Semester	
Lecturer	Shinya YAGI Professor	Satoshi OGAWA Assistant Professor

●Course Purpose

The aim of this seminar is to understand the basic technical contents about the energy materials, environmental materials, X-ray spectroscopic measurement, and photoelectron spectroscopy measurement methods and physics through the lecture and discussion.

●Prerequisite Subjects

condensed matter theory, electronic structure in materials, quantum mechanics, electromagnetics theory, quantum chemistry, X-ray spectroscopy, instrument of synchrotron radiation

●Course Topics

In this seminar, the following contents will be covered in order to understand basic knowledge about surfaces and bulk, and to promote understanding of the principles, analysis and interpretation of analytical methods to clarifymaterial's structures and chemical bonding states.1: Surface and bulk2: Chemical bonding state3: Nano materials and environmental functional materials4: X-ray spectroscopy, photoelectron spectroscopy5: Various devices for synchrotron radiation facility

●Textbook

"Introduction to Solid State Physics", Kittel, Willy

●Additional Reading

Distribute necessary prints

●Grade Assessment

attendance and implementation of a problem

●Notes

nothing

●Contacting Faculty

e-mail: yagi.shinya@c.mbox.nagoya-u.ac.jpPhone: 052-747-6828

Energy Engineering Seminar 2E (2.0credits) (エネルギー理工学セミナー2E)

Course Type	Specialized Courses
Division at course	Doctor's Course
Class Format	Seminar
Course Name	Department of Energy Engineering
Starts 1	3 Spring Semester
Lecturer	Hideki TOMITA Associate Professor

●Course Purpose
Developing of abilities to find essential problems and their original solutions for some subjects related to the student's doctor thesis in the research field of quantum beam measurement

●Prerequisite Subjects
Seminar on Quantum Beam Measurement 1-A,B,C,D, Electromagnetism, Quantum Mechanics, Atomic Physics, Material Science, Fundamentals of Nuclear Radiation Measurement

●Course Topics
Report and discussion on the results obtained through investigating the reference books and papers, specifying the problems, finding the solution and making some analysis for an appropriate research subject related to the student's doctor thesis.

●Textbook
None

●Additional Reading
Reference papers related to quantum beam measurement selected from academic journals, such as IEEE Trans. Nucl.Sci., Nucl.Instrum.Meth., Rev.Sci.Instrum, etc.

●Grade Assessment
Oral Examinations
Grade point:
Pass mark is more than 60 points for full marks of 100 points.
(For students of Year 2020 entrance and later)
100-95:A+, 94-80:A, 79-70:B, 69-65:C, 64-60:C-, <59:F
(For students of Year 2019 entrance and earlier)
100-90:S, 89-80:A, 79-70:B, 69-60:C, <59:F

●Notes
None

Please contact the lecturer of the course.

●Contacting Faculty
The questions will be answered by e-mail.

Address: h-tomita(at)energy.nagoya-u.ac.jp
(Please replace (at) with @.)

Energy Engineering Seminar 2E (2.0credits) (エネルギー理工学セミナー2E)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Department of Energy Engineering	
Starts 1	3 Spring Semester	
Lecturer	Michihiro SHIBATA Professor	Yasuaki KOJIMA Associate Professor

●Course Purpose

Reading and presentation by turns basic textbooks and related papers to advance development of the structure of the atomic nucleus and the experimental technique. Understanding about a research trend of the related field, moreover learning about its applicability.Application ability and the invention are put on through these studies. Specifically, the following things are studied. 1. understand and explain the elucidation technique of the nuclear structure by the radiation measurement 2. know a document of nuclear data and a web site necessary to an experiment and utilize appropriately.3. understand the basic thesis the nuclear structure and explain the contents.4. understand and explain new radiation measurements technique and nuclear measurements technique

●Prerequisite Subjects

Nuclear physics, Quantum mechanics, Radiation measurements

●Course Topics

1. Structure of atomic nuclei1-1. liquid drop model and shell model1-2. collective model and unified model2. Nuclear reaction2-1. Compound nuclei 2-2. Resonance3. Accelerator4. Radiation sources and radioisotope production 5. Radiation measurements and nuclear structure6. Utilization of Nuclear Data libraryShare a technical book or material about the above contents, translate the person in charge into Japanese beforehand, and show translations as well as explain the contents together at the session. Anyone but the person in charge understand the language.

●Textbook

introduce the textbooks in the beginning of the fiscal year

●Additional Reading

introduce books and thesis according to the progress.

●Grade Assessment

Goal attainment level is estimated by the degree of the oral announcement in a seminar, the question and answer to that and the participation in argument. The degree of the preparation and the degree of participation to the oral announcement, the question and answer and the argument are set to 50%, 30% and 20% respectively.

●Notes

No registration conditions required

●Contacting Faculty

in class or officeProf. SHIBATA, Michihiro ex.2569e-mail:i45329a@nucc.cc.nagoya-u.ac.jpAssoc. Prof. KOJIMA, Yasuakiex.2572e-mailkojima.yasuaki@f.mbox.nagoya-u.ac.jp

Energy Engineering Seminar 2E (2.0credits) (エネルギー理工学セミナー2E)

Course Type	Specialized Courses
Division at course	Doctor's Course
Class Format	Seminar
Course Name	Department of Energy Engineering
Starts 1	3 Spring Semester
Lecturer	Yoshiyuki TSUJI Professor

●Course Purpose

Learn the foundamental aspect of energy system.

●Prerequisite Subjects

●Course Topics

●Textbook

S.B.Pope, Turbulent Flow, Cambridge Univ. PressP.A.Davidson, Turbulence, Oxford Univ. Press Other references are served by hard copies.

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Energy Engineering Seminar 2E (2.0credits) (エネルギー理工学セミナー2E)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Department of Energy Engineering		
Starts 1	3 Spring Semester		
Lecturer	Kiyomasa WATANABE Professor	Eiji IKENAGA Associate Professor	Tatsuya Assistant Professor

●Course Purpose

Deep understanding of fundamental plasma science and engineering by referring the articles on the following topics: Plasma particle and heat transport, MHD stability of magnetized plasmas, edge plasma phenomena, plasma heating.Through the above methods, the student's skill of the presentation will be improved.Purpose1. Understand the contents of the articles on the wave in the magnetized plasmas.2. Understand the logic, idea, method and conclusion of the articles on the wave in the magnetized plasmas.3. Extract the logic, idea, method and conclusion of the articles and explain them to the other persons.

●Prerequisite Subjects

Fundamentals of plasma and fusion science

●Course Topics

Read articles in Journal club type class1.Wave in plasmas, 2.Wave in magnetized plasma, 3.Thermal effects on wave in plasmas, 4.Plasma heating and current drive by RF wave

●Textbook

●Additional Reading

●Grade Assessment

oral examination and discussion

●Notes

There is no certificate to take this course.

●Contacting Faculty

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	
Lecturer	Associated Faculty		

●Course Purpose

The aim of this course is to expand the student’s ability as a researcher by studying in an abroad laboratory and learn different methods and ways of thinking, as well as communicate on a daily base with foreign researchers.

By completing the course, the students are expected to acquire various research methods and ways of thinking, gain the ability to tackle research problems from multiple angles, and acquire a broad international perspective.

●Prerequisite Subjects

Basic and specialized subjects related to the research subject, English, Advanced Lectures on Scientific English

●Course Topics

Students will stay in an abroad laboratory that will be chosen based on the participant’s research field and interest. The course consists of the following contents.

1. Theme setting and literature review
2. Formulating a research plan
3. Analyzing the results and discussion
4. Presentation of the results

After the class, students should review the analyzing processes of the research results and investigate related literatures.

●Textbook
Will be introduced at the host laboratory depending on the research subject

●Additional Reading
Will be introduced at the host laboratory if necessary

●Grade Assessment
Conducting research in an abroad laboratory for one semester and submitting a report is a prerequisite. Evaluation will be based on the student's report (50%) and oral presentation (50%). To pass, the students have to demonstrate that they have the capacity to adequately analyze the results and have acquired the basic knowledge to interpret the results.

●Notes

●Contacting Faculty
Questions will be answered by the supervisors at the host laboratory during the course.

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	
Lecturer	Associated Faculty		

●Course Purpose

The aim of this course is to expand the student’s ability as a researcher by studying in an abroad laboratory and learn different methods and ways of thinking, as well as communicate on a daily base with foreign researchers.

By completing the course, the students are expected to acquire various research methods and ways of thinking, gain the ability to tackle research problems from multiple angles, and acquire a broad international perspective.

●Prerequisite Subjects

Basic and specialized subjects related to the research subject, English, Advanced Lectures on Scientific English

●Course Topics

Students will stay in an abroad laboratory that will be chosen based on the participant’s research field and interest. The course consists of the following contents.

1. Theme setting and literature review
2. Formulating a research plan
3. Analyzing the results and discussion
4. Presentation of the results

After the class, students should review the analyzing processes of the research results and investigate related literatures.

●Textbook
Will be introduced at the host laboratory depending on the research subject

●Additional Reading
Will be introduced at the host laboratory if necessary

●Grade Assessment
Conducting research in an abroad laboratory for two semesters and submitting a report is a prerequisite. Evaluation will be based on the student's report (50%) and oral presentation (50%). To pass, the students have to demonstrate that they have the capacity to adequately analyze the results and have acquired the basic knowledge to interpret the results.

●Notes

●Contacting Faculty
Questions will be answered by the supervisors at the host laboratory during the course.

Teaching and Instruction Exercise 1 (1.0credits) (実験指導体験実習1)

Course Type	Comprehensive engineering courses		
Division at course	Doctor's Course		
Class Format	Practice		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	
Lecturer	Shinji DOKI Professor		

●Course Purpose

While attendance is raw, in "the innovation experience project," I stand with a company engineer (DP, Directing Professor) and carry an assistance, DP of the attendance straight instruction by the DP and the role of the interface of the attendance student. In this way, it is intended to let you do experience of the project management.

I aim for planning a researcher, improvement of the nature as the leader, the expansion of the field of vision by a simulated experience of instruction of the attendance life and the business management in the real world.

●Prerequisite Subjects

"Innovation Practice Course" 75 hours(Principle one day a week)

●Course Topics

In "the innovation experience project," I assist the project promotion by the DP.

Help of the understanding of a project theme and contents for the attendance life of various specialisms

I compile an opinion of the attendance life and let you make a purpose, the method of the project clear

Exchange of opinions between the attendance life, instruction, report of the discussion

Communication adjustment that DP and attendance are raw

I assume this a main component.

In addition, correspondence out of the lecture time is necessary when preparations, an investigation to affect project accomplishment are necessary.

●Textbook

Papers, books and/or documents that the lecturer (DP) will introduce.

●Additional Reading

Papers, books and/or documents that the lecturer (DP) will introduce.

●Grade Assessment

I evaluate it through accomplishment, the discussion of the project. If display of leadership, report ability and the leadership is accepted, it is said that I pass.

●Notes

No specific requirements.

●Contacting Faculty

The lecturer (DP) and the project staff of the university accept questions at any time.

Teaching and Instruction Exercise 2 (1.0credits) (実験指導体験実習2)

Course Type	Comprehensive engineering courses		
Division at course	Doctor's Course		
Class Format	Practice		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	
Lecturer	Manato DEKI Associate Professor		

●Course Purpose

The purpose of this course is to provide guidance to semester students for advanced science and engineering experiments at the Venture Business Laboratory. Through this research guidance, students will be able to play a comprehensive role as a researcher / educator and instructor in the field in charge of Raman spectroscopy, ionization potential measurement, X-ray diffraction measurement, and molecular simulation, and will be able to provide research guidance. Useful for practical training as a research leader.

●Prerequisite Subjects

Knowledge of the field in charge selected from the fields of Raman spectroscopy, ionization potential measurement, X-ray diffraction measurement, and molecular simulation.

●Course Topics

In the student experiment, the instructor students provide guidance to attendant students on subject research and original research from the field of Raman spectroscopy, ionization potential measurement, X-ray diffraction measurement, and molecular simulation with the professional teacher. Together with the attendant students, they perform practical use these equipment and software and get the results. They experience the leadership of the research, providing research guidance, report preparation guidance, and presentation guidance.

●Textbook

Required documents is distributed.

●Additional Reading

Required documents is distributed.

●Grade Assessment

Evaluate by compiling experiments / exercises, teaching (70%), and interviewing (30%). Students who understand each device and software and give appropriate guidance are accepted, and their research results and new approaches are highly evaluated. A score of 60 or more out of 100 is a passing score.

●Notes

To have a deep understandinginonefieldfromRamanspectroscopy,ionizationpotentialmeasurement,X-ray diffraction measurement,and molecular simulation.

●Contacting Faculty

Arranging the schedules by e-mail and etc.

Research Internship2 U2 (2.0credits) (研究インターンシップ２ U2)

Course Type	Comprehensive engineering courses		
Division at course	Doctor's Course		
Class Format	Practice		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	
Lecturer	Shinji DOKI Professor		

●Course Purpose

Research internship is different from conventional internship for a working experience. Staffs in the faculty and instructors in a company cooperate with each other to set up research themes adequate to the doctoral course, and supervise a long-term internship for 1-6 months. This course aims at training of a person who has ability for an advanced research and development in not only a specialized field but also a multidisciplinary field, and a leader capable of making a proper judgment in a research project.

●Prerequisite Subjects

Students attending Research Internship are strongly recommended to take short-term Patent Laws and Focus on Venture Business I or II before the attendance.

●Course Topics

A student applies for a theme for research set up under the cooperation of a company and Nagoya University. Students should attend at the lecture at the university on the duty of confidentiality and the protection of intellectual property rights before starting the internship.

●Textbook

Papers, books and/or documents that the staff instructing the training in the company will introduce.

●Additional Reading

Papers, books and/or documents that the staff instructing the training in the company will introduce.

●Grade Assessment

The credits will be given to the students who have had the working days less than or equal to 20 days in the internship company.

●Notes

No specific requirements.

●Contacting Faculty

The questions will be answered by the direct supervisors as needed at the internship.

Research Internship2 U3 (3.0credits) (研究インターンシップ２ U3)

Course Type	Comprehensive engineering courses		
Division at course	Doctor's Course		
Class Format	Practice		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	
Lecturer	Shinji DOKI Professor		

●Course Purpose

Research internship is different from conventional internship for a working experience. Staffs in the faculty and instructors in a company cooperate with each other to set up research themes adequate to the doctoral course, and supervise a long-term internship for 1-6 months. This course aims at training of a person who has ability for an advanced research and development in not only a specialized field but also a multidisciplinary field, and a leader capable of making a proper judgment in a research project.

●Prerequisite Subjects

Students attending Research Internship are strongly recommended to take short-term Patent Laws and Focus on Venture Business I or II before the attendance.

●Course Topics

A student applies for a theme for research set up under the cooperation of a company and Nagoya University. Students should attend at the lecture at the university on the duty of confidentiality and the protection of intellectual property rights before starting the internship.

●Textbook

Papers, books and/or documents that the staff instructing the training in the company will introduce.

●Additional Reading

Papers, books and/or documents that the staff instructing the training in the company will introduce.

●Grade Assessment

The credits will be given to the students who have had the working days between 21 and 40 days in the internship company.

●Notes

No specific requirements.

●Contacting Faculty

The questions will be answered by the direct supervisors as needed at the internship.

Research Internship2 U4 (4.0credits) (研究インターンシップ２ U4)

Course Type	Comprehensive engineering courses		
Division at course	Doctor's Course		
Class Format	Practice		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	
Lecturer	Shinji DOKI Professor		

●Course Purpose

Research internship is different from conventional internship for a working experience. Staffs in the faculty and instructors in a company cooperate with each other to set up research themes adequate to the doctoral course, and supervise a long-term internship for 1-6 months. This course aims at training of a person who has ability for an advanced research and development in not only a specialized field but also a multidisciplinary field, and a leader capable of making a proper judgment in a research project.

●Prerequisite Subjects

Students attending Research Internship are strongly recommended to take short-term Patent Laws and Focus on Venture Business I or II before the attendance.

●Course Topics

A student applies for a theme for research set up under the cooperation of a company and Nagoya University. Students should attend at the lecture at the university on the duty of confidentiality and the protection of intellectual property rights before starting the internship.

●Textbook

Papers, books and/or documents that the staff instructing the training in the company will introduce.

●Additional Reading

Papers, books and/or documents that the staff instructing the training in the company will introduce.

●Grade Assessment

The credits will be given to the students who have had the working days between 41 and 60 days in the internship company.

●Notes

No specific requirements.

●Contacting Faculty

The questions will be answered by the direct supervisors as needed at the internship.

Research Internship2 U6 (6.0credits) (研究インターンシップ２ U6)

Course Type	Comprehensive engineering courses		
Division at course	Doctor's Course		
Class Format	Practice		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	
Lecturer	Shinji DOKI Professor		

●Course Purpose

Research internship is different from conventional internship for a working experience. Staffs in the faculty and instructors in a company cooperate with each other to set up research themes adequate to the doctoral course, and supervise a long-term internship for 1-6 months. This course aims at training of a person who has ability for an advanced research and development in not only a specialized field but also a multidisciplinary field, and a leader capable of making a proper judgment in a research project.

●Prerequisite Subjects

Students attending Research Internship are strongly recommended to take short-term Patent Laws and Focus on Venture Business I or II before the attendance.

●Course Topics

A student applies for a theme for research set up under the cooperation of a company and Nagoya University. Students should attend at the lecture at the university on the duty of confidentiality and the protection of intellectual property rights before starting the internship.

●Textbook

Papers, books and/or documents that the staff instructing the training in the company will introduce.

●Additional Reading

Papers, books and/or documents that the staff instructing the training in the company will introduce.

●Grade Assessment

The credits will be given to the students who have had the working days between 61 and 80 days in the internship company.

●Notes

No specific requirements.

●Contacting Faculty

The questions will be answered by the direct supervisors as needed at the internship.

Research Internship2 U8 (8.0credits) (研究インターンシップ２ U8)

Course Type	Comprehensive engineering courses		
Division at course	Doctor's Course		
Class Format	Practice		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	
Lecturer	Shinji DOKI Professor		

●Course Purpose

Research internship is different from conventional internship for a working experience. Staffs in the faculty and instructors in a company cooperate with each other to set up research themes adequate to the doctoral course, and supervise a long-term internship for 1-6 months. This course aims at training of a person who has ability for an advanced research and development in not only a specialized field but also a multidisciplinary field, and a leader capable of making a proper judgment in a research project.

●Prerequisite Subjects

Students attending Research Internship are strongly recommended to take short-term Patent Laws and Focus on Venture Business I or II before the attendance.

●Course Topics

A student applies for a theme for research set up under the cooperation of a company and Nagoya University. Students should attend at the lecture at the university on the duty of confidentiality and the protection of intellectual property rights before starting the internship.

●Textbook

Papers, books and/or documents that the staff instructing the training in the company will introduce.

●Additional Reading

Papers, books and/or documents that the staff instructing the training in the company will introduce.

●Grade Assessment

The credits will be given to the students who have had the working days more than or equal to 81 daysin the internship company.

●Notes

No specific requirements.

●Contacting Faculty

The questions will be answered by the direct supervisors as needed at the internship.