Special Basical Lecture of Applied Energy (2.0credits) (総合エネルギー工学基礎特論)

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

●Course Purpose

This series of lectures focus on recent achievements of advanced research in the field of energy engineering together with the contemporary research infrastructure, aiming to give relevant fundamental knowledge and to cultivate ability of application in postgraduate students who intend to be researchers.

●Prerequisite Subjects

All classes opened in the department of Energy Engineering and Science in School of Engineering, Nagoya University.

●Course Topics

Each member of Department of Applied Energy will give a lecture on base and recent technology related to his/her research field. Reporting to every lecture is mandatory.

●Textbook

No specific textbook is specified. Lecture notes and handouts will be ditributed through NUCT.

●Additional Reading

The references related to the lectures will be introduced in every lecture.

●Grade Assessment

Outcomes are evaluated on the final exam or reportingas; a student who marks greater than 60% pass the class. a student who has successfully solved an advanced problems appeared in the reporting exercises may gain additional points for evaluation.

Evaluation of grade will follow the standard provided by the Graduate School of Engineering.

●Notes

No special condition is required.
Because the most recent and not-yet-published knowledges are provided, attendance at all lecture is strongly recommended. The potential attendants should inform the professor in charge of the class of his/her studentID. See notice on NUCT.
The details will be available on NUCT.

●Contacting Faculty

Discussions in each lecture are strongly recommended to understand the recent advances in Applied Energy Engineering. Inqueries by students are welcomed after class through NUCT.

Instructor in charge: Assoc. Prof. Atsushi Okamoto
a-okamoto@energy.nagoya-u.ac.jp

Applied Energy Seminar 1A (2.0credits) (総合エネルギー工学セミナー1A)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Seminar
Course Name	Department of Applied Energy
Starts 1	1 Spring Semester
Lecturer	TakaakiFUJITA Professor Atsushi OKAMOTO Associate Professor

●Course Purpose

Lecturing in turn on textbooks or papers on plasma physics and nuclear fusion.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Applied Energy Seminar 1A (2.0credits) (総合エネルギー工学セミナー1A)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Department of Applied Energy	
Starts 1	1 Spring Semester	
Lecturer	Teruya TANAKA Associate Professor	Haruhisa NAKANO Associate Professor

●Course Purpose

In this seminar, understanding of status and issues in engineering studies for fusion power generation are conducted first, and then studying method and process for solving the issues, consideration on obtained data and conclusion of the study are reviewed and discussed. The seminar aims to obtain fundamental abilities to solve physical/engineering issues independently.

●Prerequisite Subjects

Electromagnetics, plasma engineering, mechanics, physical chemistry, related fundamental physics

●Course Topics

1) Components and materials required for fusion power generation and issues
2) Consideration of experimental and calculation methods to solve issues
3) Understanding and discussion on obtained experimental and calculated data
4) Conclusion extracted from obtained results
Preparation is required for assigned documents and issues to be investigated.

●Textbook

Information on papers to be read will be provided.

●Additional Reading

1)F. F. Chen, "Introduction to Plasma Physics and Controlled Fusion", Third Edition, Springer 2016.
2)R. Goldston, H.P. Rutherford, "Introduction to Plasma Physics", IOP Publishing 1995.
3)Nuclear Fusion Research II - Fusion Reactor Engineering (The University of Nagoya Press) in Japanese.
(Necessary materials will be distributed.)

●Grade Assessment

Presentation and/or oral examination.
A score higher than 60/100 is required for the credit.
C: 60-69, B: 70-79, A: 80-89, S: 90-100.

●Notes

No requirements for registration.

●Contacting Faculty

Responded by mails or discussion (in person or online).

Applied Energy Seminar 1A (2.0credits) (総合エネルギー工学セミナー1A)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Department of Applied Energy		
Starts 1	1 Spring Semester		
Lecturer	Youichi ENOKIDA Professor	Takahiko SUGIYAMA Associate Professor	Kayo SAWADA Associate Professor
	Akira KUWAHARA Assistant Professor		

●Course Purpose

This seminar aims at gaining an ability of formal written and oral presentations of study proposal and actual performing theoretical and experimental process analyses on the proposed study to master the essential ability as a master course student in the Department of Applied Energy.Additionally participants are required to cultivate fundamental knowledge on research safety and ethics, and should complete taking research notes in an adequate manner as a part of researcher's fundamentals.A student can expect obtaining ability of research planning, performing, and presentation of the results at an academic meeting or submission of a research paper.

●Prerequisite Subjects

Nuclear Fuel Cycle Engineering

●Course Topics

1. Literature survey on previous studies concerning to Energy Resources Recycling Engineering,
2. Proposal and planning of a study on Energy Resources Recycling Engineering,
3. Theoretical analysis on the proposed study,
4. Experimental analysis on the proposed study,
5. Oral presentation on the research results, and
6. Technical writing on the research results.

Before each class of the seminar, a student take this class should write on his or her research note summaries of results on literature survey, research activity, and discussion on the results, which are reported in the seminar.

●Textbook

1) M. Faraday, "Faraday's Diary of Experimental Investigation Vol.1-7," HI Direct (2008).
2) According with the advancement of research plan, the other textbooks or research papers are to be suggested.

●Additional Reading

Y. Okazaki, 'How to write laboratory note,' Yodosya (2013)

●Grade Assessment

Oral presentation at each seminar(50%) and oral presentation at the academic meeting or paper submission(50%)
A student pass the class by achieving the each content of the class. Extra outcomes such as presentation at the academic meeting, its preparation or submitting a research paper is considered for additional points. Evaluation of grade will follow the standard provided by the Graduate School of Engineering. Obtaining 'A+ (S)' grade is granted for a student who has had an oral presentation at an international conference or authored an academic paper to be published in a periodical academic journal or equivalent during the semester.

●Notes

A student who take this class must have enough knowledge on laboratory safety, and hold an own laboratory notebook.

●Contacting Faculty

Please feel free to inquire on the lecture and problem solving by voice phone or e-mail in English or in Japanese, as follows;

By phone; 052(789)5937 during office hours from 7:30 through 16:00,
By e-mail; yenokida@nagoya-u.jp.

Applied Energy Seminar 1A (2.0credits) (総合エネルギー工学セミナー1A)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Department of Applied Energy		
Starts 1	1 Spring Semester		
Lecturer	Akira URITANI Professor	Sachiko YOSHIHASHI Associate Professor	Atsushi YAMAZAKI Assistant Professor

●Course Purpose

You will read textbooks and papers necessary for the advancement of research using the interaction between neutrons and radiation and nuclei. You will present the contents.
Through these studies, you will gain the ability to understand the details of neutron and/or radiation measurement methods and application methods of their application.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Applied Energy Seminar 1A (2.0credits) (総合エネルギー工学セミナー1A)

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

●Course Purpose

By reviewing literature on radiation protection, environmental radioactivity and radiations, and global environmental problems related to energy usage, methodology and procedure of carrying out a research will be learned. Aim: Students are 1. to understand methodology of study on environmental radioactivity and radiation, radiation protection, natural material circulation, or isotope analysis and to become able to carry out a study under supervision of teaching staff, 2 to understand fundamental sciences of global environmental problems and energy environmental safely, and to become able to rationally discuss typical examples of them.

●Prerequisite Subjects

Radiation and Health Physics, Nuclear Environmental Safety, Radiation Measurements, Isotope Analysis

●Course Topics

1. Radiation protection
2. Environmental radioactivity and radiation
3. Energy use-related environmental safety
4. Environmental transfer of materials: mechanisms and modeling
5. Radiation measurements and isotope analysis

●Textbook

A textbook and research articles will be designated at the beginning.

●Additional Reading

none

●Grade Assessment

Achievement will be evaluated by oral presentation and discussion in the seminar. Minimum mark for credit is 60/100.

●Notes

●Contacting Faculty

ext. 3781 yamazawa@nagoya-u.jp,
ext. 4695 tomita@nagoya-u.jp

Applied Energy Seminar 1A (2.0credits) (総合エネルギー工学セミナー1A)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Department of Applied Energy	
Starts 1	1 Spring Semester	
Lecturer	"YAMAMOTO Akio" Professor	ENDO Tomohiro Associate Professor

●Course Purpose

The goal is to read the original papers on nuclear reactor physics and nuclear energy control engineering to learn the current state of research and to learn how to proceed and summarize the research.

The objectives of this lecture are as follows.
Understand and explain basic matters in a wide range of reactor physics and nuclear energy control engineering.
Point out the problems of previous research in specific fields of nuclear reactor physics and nuclear energy control engineering, and propose methodologies to solve them.

●Prerequisite Subjects

Reactor physics

●Course Topics

1.Reactor design method
2.Sensitivity and uncertainty analysis
3.Optimization method
4.Nuclear safety
5.Criticality safety
6.Reactor noise diagnostics

Read relevant literature before the lecture and prepare for the lesson. After the lecture, review the contents of the lecture and check the examples again.

●Textbook

Introduce according to the content of the lecture.

●Additional Reading

Introduce according to the content of the lecture.

●Grade Assessment

Evaluate the level of achievement for the achievement target through reports and oral examinations during lectures. If you have a basic understanding of the content covered in this lecture, you will pass.

●Notes

According to Guidelines for Activities at Nagoya University During the Novel Coronavirus (COVID-19) Pandemic, face-to-face lectures may not be held.
In this case, the web lectures using "Zoom" instead of the face-to-face classes will be used.
The lecture's URL will be notified on NUCT (https://ct.nagoya-u.ac.jp/portal).

No registration requirements.

●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.

Contact: a-yamamoto[at]energy.(domain name of Nagoya University)

Applied Energy Seminar 1B (2.0credits) (総合エネルギー工学セミナー1B)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Seminar
Course Name	Department of Applied Energy
Starts 1	1 Autumn Semester
Lecturer	TakaakiFUJITA Professor Atsushi OKAMOTO Associate Professor

●Course Purpose

Lecturing in turn on textbooks or papers on plasma physics and nuclear fusion.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Applied Energy Seminar 1B (2.0credits) (総合エネルギー工学セミナー1B)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Department of Applied Energy	
Starts 1	1 Autumn Semester	
Lecturer	Teruya TANAKA Associate Professor	Haruhisa NAKANO Associate Professor

●Course Purpose

In this seminar, understanding of status and issues in engineering studies for fusion power generation are conducted first, and then studying method and process for solving the issues, consideration on obtained data and conclusion of the study are reviewed and discussed. The seminar aims to obtain fundamental abilities to solve physical/engineering issues independently.

●Prerequisite Subjects

Electromagnetics, plasma engineering, mechanics, physical chemistry, related fundamental physics

●Course Topics

1) Components and materials required for fusion power generation and issues
2) Consideration of experimental and calculation methods to solve issues
3) Understanding and discussion on obtained experimental and calculated data
4) Conclusion extracted from obtained results
Preparation is required for assigned documents and issues to be investigated.

●Textbook

Information on textbooks and papers to be read will be provided.

●Additional Reading

1)F. F. Chen, "Introduction to Plasma Physics and Controlled Fusion", Thrid Edition, Springer 2016.
2)R. Goldston, H.P. Rutherford, "Introduction to Plasma Physics", IOP Publishing 1995.
3)Nuclear Fusion Research II - Fusion Reactor Engineering (The University of Nagoya Press) in Japanese.
(Necessary materials will be distributed.)

●Grade Assessment

Presentation and/or oral examination.
A score higher than 60/100 is required for the credit.
C: 60-69, B: 70-79, A: 80-89, S: 90-100.

●Notes

No requirements for registration.

●Contacting Faculty

Responded by mails or discussion (in person or online).

Applied Energy Seminar 1B (2.0credits) (総合エネルギー工学セミナー1B)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Department of Applied Energy		
Starts 1	1 Autumn Semester		
Lecturer	Youichi ENOKIDA Professor	Takahiko SUGIYAMA Associate Professor	Kayo SAWADA Associate Professor
	Akira KUWAHARA Assistant Professor		

●Course Purpose

This seminar aims at gaining an ability of formal written and oral presentations of study proposal and actual performing theoretical and experimental process analyses on the proposed study to master the essential ability as a master course student in the Department of Applied Energy.Additionally participants are required to cultivate fundamental knowledge on research safety and ethics, and should complete taking research notes in an adequate manner as a part of researcher's fundamentals.A student can expect obtaining ability of research planning, performing, and presentation of the results at an academic meeting or submission of a research paper.

●Prerequisite Subjects

1) Nuclear Fuel Cycle Engineering,
2) Process Systems Engineering for Energy Resources

●Course Topics

1. Literature survey on previous studies concerning to Energy Resources Recycling Engineering,
2. Proposal and planning of a study on Energy Resources Recycling Engineering,
3. Theoretical analysis on the proposed study,
4. Experimental analysis on the proposed study,
5. Oral presentation on the research results, and
6. Technical writing on the research results.

Before each class of the seminar, a student take this class should write on his or her research note summaries of results on literature survey, research activity, and discussion on the results, which are reported in the seminar.

●Textbook

1) M. Faraday, "Faraday's Diary of Experimental Investigation Vol.1-7," HI Direct (2008).
2) According with the advancement of research plan, the other textbooks or research papers are to be suggested.

●Additional Reading

Y. Okazaki, 'How to write laboratory note,' Yodosya (2013)

●Grade Assessment

Oral presentation at each seminar(60%) and oral presentation at the academic meeting or paper submission(40%)
A student pass the class by achieving the each content of the class. Extra outcomes such as presentation at the academic meeting or submitting a research paper is considered for additional points. Evaluation of grade will follow the standard provided by the Graduate School of Engineering. Obtaining 'A+ (S)' grade is granted for a student who has had an oral presentation at an international conference or authored an academic paper to be published in a periodical academic journal or equivalent during the semester.

●Notes

A student who take this class must have enough knowledge on laboratory safety,
and hold an own laboratory notebook.

●Contacting Faculty

Please feel free to inquire on the lecture and problem solving by voice phone or e-mail in English or in Japanese, as follows;

By phone; 052(789)5937 during office hours from 7:30 through 16:00,
By e-mail; yenokida@nagoya-u.jp.

Applied Energy Seminar 1B (2.0credits) (総合エネルギー工学セミナー1B)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Department of Applied Energy		
Starts 1	1 Autumn Semester		
Lecturer	Akira URITANI Professor	Sachiko YOSHIHASHI Associate Professor	Atsushi YAMAZAKI Assistant Professor

●Course Purpose

You will read textbooks and papers necessary for the advancement of research using the interaction between neutrons and radiation and nuclei. You will present the contents.Through these studies, you will gain the ability to understand the details of neutron and/or radiation measurement methods and application methods of their application.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Applied Energy Seminar 1B (2.0credits) (総合エネルギー工学セミナー1B)

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

●Course Purpose

By reviewing literature on radiation protection, environmental radioactivity and radiations, and global environmental problems related to energy usage, methodology and procedure of carrying out a research will be learned. Aim: Students are

1. to understand methodology of study on environmental radioactivity and radiation, radiation protection, natural material circulation, or isotope analysis, and to become able to carry out a study under supervision of teaching staff,
2. to understand fundamental sciences of global environmental problems and energy environmental safely, and to become able to rationally discuss typical examples of them.

●Prerequisite Subjects

Radiation and Health Physics, Nuclear Environmental Safety, Radiation Measurements, Isotope Analysis

●Course Topics

1. Radiation protection
2. Environmental radioactivity and radiation
3. Energy use-related environmental safety
4. Environmental transfer of materials: mechanisms and modeling
5. Radiation measurements and isotope analysis

●Textbook

A textbook and research articles will be designated at the beginning.

●Additional Reading

none

●Grade Assessment

Achievement will be evaluated by oral presentation and discussion in the seminar. Minimum mark for credit is 60/100.

●Notes

●Contacting Faculty

ext. 3781 yamazawa@nagoya-u.jp,
ext. 4695 tomita@nagoya-u.jp

Applied Energy Seminar 1B (2.0credits) (総合エネルギー工学セミナー1B)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Department of Applied Energy	
Starts 1	1 Autumn Semester	
Lecturer	"YAMAMOTO Akio" Professor	ENDO Tomohiro Associate Professor

●Course Purpose

The purpose of this study is to read the original papers on nuclear reactor physics and nuclear energy control engineering to learn the current status of research and to learn how to proceed and summarize the research.

The objectives of this lecture are as follows.
Understand and explain basic matters in a wide range of reactor physics and nuclear energy control engineering.
Point out the problems of previous research in specific fields of nuclear reactor physics and nuclear energy control engineering, and propose methodologies to solve them.

●Prerequisite Subjects

Reactor physics

●Course Topics

1.Reactor design method
2.Sensitivity and uncertainty analysis
3.Optimization method
4.Nuclear safety
5.Criticality safety
6.Reactor noise diagnostics

Read relevant literature before the lecture and prepare for the lesson. After the lecture, review the contents of the lecture and check the examples again.

●Textbook

Introduce according to the content of the lecture.

●Additional Reading

Introduce according to the content of the lecture.

●Grade Assessment

Evaluate the level of achievement for the achievement target through reports and oral examinations during lectures. If you have a basic understanding of the content covered in this lecture, you will pass.

●Notes

According to Guidelines for Activities at Nagoya University During the Novel Coronavirus (COVID-19) Pandemic, face-to-face lectures may not be held.
In this case, the web lectures using "Zoom" instead of the face-to-face classes will be used.
The lecture's URL will be notified on NUCT (https://ct.nagoya-u.ac.jp/portal).

No registration requirements.

●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.

Contact: a-yamamoto[at]energy.(domain name of Nagoya University)

Applied Energy Seminar 1C (2.0credits) (総合エネルギー工学セミナー1C)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Seminar
Course Name	Department of Applied Energy
Starts 1	2 Spring Semester
Lecturer	TakaakiFUJITA Professor Atsushi OKAMOTO Associate Professor

●Course Purpose

Lecturing in turn on textbooks or papers on plasma physics and nuclear fusion.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Applied Energy Seminar 1C (2.0credits) (総合エネルギー工学セミナー1C)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Department of Applied Energy	
Starts 1	2 Spring Semester	
Lecturer	Teruya TANAKA Associate Professor	Haruhisa NAKANO Associate Professor

●Course Purpose

In this seminar, understanding of status and issues in engineering studies for fusion power generation are conducted first, and then studying method and process for solving the issues, consideration on obtained data and conclusion of the study are reviewed and discussed. The seminar aims to obtain fundamental abilities to solve physical/engineering issues independently.

●Prerequisite Subjects

Electromagnetics, plasma engineering, mechanics, physical chemistry, related fundamental physics

●Course Topics

1) Components and materials required for fusion power generation and issues2) Consideration of experimental and calculation methods to solve issues3) Understanding and discussion on obtained experimental and calculated data4) Conclusion extracted from obtained resultsPreparation is required for assigned documents and issues to be investigated.

●Textbook

Information on textbooks and papers to be read will be provided.

●Additional Reading

1)F. F. Chen, "Introduction to Plasma Physics and Controlled Fusion", Thrid Edition, Springer 2016.2)R. Goldston, H.P. Rutherford, "Introduction to Plasma Physics", IOP Publishing 1995.3)Nuclear Fusion Research II - Fusion Reactor Engineering (The University of Nagoya Press) in Japanese.(Necessary materials will be distributed.)

●Grade Assessment

Presentation and/or oral examination.A score higher than 60/100 is required for the credit.C: 60-69, B: 70-79, A: 80-89, S: 90-100.

●Notes

No requirements for registration.

●Contacting Faculty

Responded by mails or discussion (in person or online).

Applied Energy Seminar 1C (2.0credits) (総合エネルギー工学セミナー1C)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Department of Applied Energy		
Starts 1	2 Spring Semester		
Lecturer	Youichi ENOKIDA Professor	Takahiko SUGIYAMA Associate Professor	Kayo SAWADA Associate Professor
	Akira KUWAHARA Assistant Professor		

●Course Purpose

This seminar aims at gaining an ability of formal written and oral presentations of study proposal and actual performing theoretical and experimental process analyses on the proposed study to master the essential ability as a master course student in the Department of Applied Energy.Additionally participants are required to cultivate fundamental knowledge on research safety and ethics, and should complete taking research notes in an adequate manner as a part of researcher's fundamentals.A student can expect obtaining ability of research planning, performing, and presentation of the results at an academic meeting or submission of a research paper.

●Prerequisite Subjects

1) Nuclear Fuel Cycle Engineering,

2) Process Systems Engineering for Energy Resources

●Course Topics

1. Literature survey on previous studies concerning to Energy Resources Recycling Engineering,
2. Proposal and planning of a study on Energy Resources Recycling Engineering,
3. Theoretical analysis on the proposed study,
4. Experimental analysis on the proposed study,
5. Oral presentation on the research results, and
6. Technical writing on the research results.

Before each class of the seminar, a student take this class should write on his or her research note summaries of results on literature survey, research activity, and discussion on the results, which are reported in the seminar.

●Textbook

1) M. Faraday, "Faraday's Diary of Experimental Investigation Vol.1-7," HI Direct (2008).
2) According with the advancement of research plan, the other textbooks or research papers are to be suggested.

●Additional Reading

Y. Okazaki, 'How to write laboratory note,' Yodosya (2013)

●Grade Assessment

Oral presentation at each seminar(60%) and oral presentation at the academic meeting or paper submission(40%)
A student pass the class by achieving the each content of the class. Extra outcomes such as presentation at the academic meeting or submitting a research paper is considered for additional points. Evaluation of grade will follow the standard provided by the Graduate School of Engineering. Obtaining 'A+ (S)' grade is granted for a student who has had an oral presentation at an international conference or authored an academic paper to be published in a periodical academic journal or equivalent during the semester.

●Notes

A student who take this class must have enough knowledge on laboratory safety,
and hold an own laboratory notebook.Additionally, credits of Applied Energy Seminar 1A and 1B should have been earned.

●Contacting Faculty

Please feel free to inquire on the lecture and problem solving by voice phone or e-mail in English or in Japanese, as follows;

By phone; 052(789)5937 during office hours from 7:30 through 16:00,
By e-mail; yenokida@nagoya-u.jp.

Applied Energy Seminar 1C (2.0credits) (総合エネルギー工学セミナー1C)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Department of Applied Energy		
Starts 1	2 Spring Semester		
Lecturer	Akira URITANI Professor	Sachiko YOSHIHASHI Associate Professor	Atsushi YAMAZAKI Assistant Professor

●Course Purpose

You will read textbooks and papers necessary for the advancement of research using the interaction between neutrons and radiation and nuclei. You will present the contents.Through these studies, you will gain the ability to understand the details of neutron and/or radiation measurement methods and application methods of their application.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Applied Energy Seminar 1C (2.0credits) (総合エネルギー工学セミナー1C)

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

●Course Purpose

By reviewing literature on radiation protection, environmental radioactivity and radiations, and global environmental problems related to energy usage, methodology and procedure of carrying out a research will be learned. Aim: Students are

1. to understand methodology of study on environmental radioactivity and radiation, radiation protection, natural material circulation, or isotope analysis, and to become able to carry out a study under supervision of teaching staff,

2 to understand fundamental sciences of global environmental problems and energy environmental safely, and to become able to rationally discuss typical examples of them.

●Prerequisite Subjects

Radiation and Health Physics, Nuclear Environmental Safety, Radiation Measurements, Isotope Analysis

●Course Topics

1. Radiation protection
2. Environmental radioactivity and radiation
3. Energy use-related environmental safety
4. Environmental transfer of materials: mechanisms and modeling
5. Radiation measurements and isotope analysis

●Textbook

A textbook and research articles will be designated at the beginning.

●Additional Reading

none

●Grade Assessment

Achievement will be evaluated by oral presentation and discussion in the seminar. Minimum mark for credit is 60/100.

●Notes

●Contacting Faculty

ext. 3781 yamazawa@nagoya-u.jp,
ext. 4695 tomita@nagoya-u.jp

Applied Energy Seminar 1C (2.0credits) (総合エネルギー工学セミナー1C)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Department of Applied Energy	
Starts 1	2 Spring Semester	
Lecturer	"YAMAMOTO Akio" Professor	ENDO Tomohiro Associate Professor

●Course Purpose

The purpose of this study is to read the original papers on nuclear reactor physics and nuclear energy control engineering to learn the current status of research and to learn how to proceed and summarize the research.

The objectives of this lecture are as follows.
Understand and explain basic matters in a wide range of reactor physics and nuclear energy control engineering.
Point out the problems of previous research in specific fields of nuclear reactor physics and nuclear energy control engineering, and propose methodologies to solve them.

●Prerequisite Subjects

Reactor physics

●Course Topics

1.Reactor design method
2.Sensitivity and uncertainty analysis
3.Optimization method
4.Nuclear safety
5.Criticality safety
6.Reactor noise diagnostics

Read relevant literature before the lecture and prepare for the lesson. After the lecture, review the contents of the lecture and check the examples again.

●Textbook

Introduce according to the content of the lecture.

●Additional Reading

Introduce according to the content of the lecture.

●Grade Assessment

Evaluate the level of achievement for the achievement target through reports and oral examinations during lectures. If you have a basic understanding of the content covered in this lecture, you will pass.

●Notes

According to Guidelines for Activities at Nagoya University During the Novel Coronavirus (COVID-19) Pandemic, face-to-face lectures may not be held.
In this case, the web lectures using "Zoom" instead of the face-to-face classes will be used.
The lecture's URL will be notified on NUCT (https://ct.nagoya-u.ac.jp/portal).

No registration requirements.

●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.

Contact: a-yamamoto[at]energy.(domain name of Nagoya University)

Applied Energy Seminar 1D (2.0credits) (総合エネルギー工学セミナー1D)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Seminar
Course Name	Department of Applied Energy
Starts 1	2 Autumn Semester
Lecturer	TakaakiFUJITA Professor Atsushi OKAMOTO Associate Professor

●Course Purpose

Lecturing in turn on textbooks or papers on plasma physics and nuclear fusion.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Applied Energy Seminar 1D (2.0credits) (総合エネルギー工学セミナー1D)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Department of Applied Energy	
Starts 1	2 Autumn Semester	
Lecturer	Teruya TANAKA Associate Professor	Haruhisa NAKANO Associate Professor

●Course Purpose

In this seminar, understanding of status and issues in engineering studies for fusion power generation are conducted first, and then studying method and process for solving the issues, consideration on obtained data and conclusion of the study are reviewed and discussed. The seminar aims to obtain fundamental abilities to solve physical/engineering issues independently.

●Prerequisite Subjects

Electromagnetics, plasma engineering, mechanics, physical chemistry, related fundamental physics

●Course Topics

1) Components and materials required for fusion power generation and issues
2) Consideration of experimental and calculation methods to solve issues
3) Understanding and discussion on obtained experimental and calculated data
4) Conclusion extracted from obtained results
Preparation is required for assigned documents and issues to be investigated.

●Textbook

Information on textbooks and papers to be read will be provided.

●Additional Reading

1)F. F. Chen, "Introduction to Plasma Physics and Controlled Fusion", Thrid Edition, Springer 2016.
2)R. Goldston, H.P. Rutherford, "Introduction to Plasma Physics", IOP Publishing 1995.
3)Nuclear Fusion Research II - Fusion Reactor Engineering (The University of Nagoya Press) in Japanese.
(Necessary materials will be distributed.)

●Grade Assessment

Presentation and/or oral examination.
A score higher than 60/100 is required for the credit.
C: 60-69, B: 70-79, A: 80-89, S: 90-100.

●Notes

No requirements for registration.

●Contacting Faculty

Responded by mails or discussion (in person or online).

Applied Energy Seminar 1D (2.0credits) (総合エネルギー工学セミナー1D)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Department of Applied Energy		
Starts 1	2 Autumn Semester		
Lecturer	Youichi ENOKIDA Professor	Takahiko SUGIYAMA Associate Professor	Kayo SAWADA Associate Professor
	Akira KUWAHARA Assistant Professor		

●Course Purpose

This seminar aims at gaining an ability of formal written and oral presentations of study proposal and actual performing theoretical and experimental process analyses on the proposed study to master the essential ability as a master course student in the Department of Applied Energy.Additionally participants are required to cultivate fundamental knowledge on research safety and ethics, and should complete taking research notes in an adequate manner as a part of researcher's fundamentals.A student can expect obtaining ability of research planning, performing, and presentation of the results at an academic meeting or submission of a research paper.

●Prerequisite Subjects

1) Nuclear Fuel Cycle Engineering,
2) Process Systems Engineering for Energy Resources

●Course Topics

1. Literature survey on previous studies concerning to Energy Resources Recycling Engineering,
2. Proposal and planning of a study on Energy Resources Recycling Engineering,
3. Theoretical analysis on the proposed study,
4. Experimental analysis on the proposed study,
5. Oral presentation on the research results, and
6. Technical writing on the research results.

Before each class of the seminar, a student take this class should write on his or her research note summaries of results on literature survey, research activity, and discussion on the results, which are reported in the seminar.

●Textbook

1) M. Faraday, "Faraday's Diary of Experimental Investigation Vol.1-7," HI Direct (2008).
2) According with the advancement of research plan, the other textbooks or research papers are to be suggested.

●Additional Reading

Y. Okazaki, 'How to write laboratory note,' Yodosya (2013)

●Grade Assessment

Oral presentation at each seminar(60%) and oral presentation at the academic meeting or paper submission(40%)
A student pass the class by achieving the each content of the class. Extra outcomes such as presentation at the academic meeting or submitting a research paper is considered for additional points. Evaluation of grade will follow the standard provided by the Graduate School of Engineering. Obtaining 'A+ (S)' grade is granted for a student who has had an oral presentation at an international conference or authored an academic paper to be published in a periodical academic journal or equivalent during the semester.

●Notes

A student who take this class must have enough knowledge on laboratory safety,
and hold an own laboratory notebook.Additionally, credits of Applied Energy Seminar 1A and 1B should have been earned.

●Contacting Faculty

Please feel free to inquire on the lecture and problem solving by voice phone or e-mail in English or in Japanese, as follows;

By phone; 052(789)5937 during office hours from 7:30 through 16:00,
By e-mail; yenokida@nagoya-u.jp.

Applied Energy Seminar 1D (2.0credits) (総合エネルギー工学セミナー1D)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Department of Applied Energy		
Starts 1	2 Autumn Semester		
Lecturer	Akira URITANI Professor	Sachiko YOSHIHASHI Associate Professor	Atsushi YAMAZAKI Assistant Professor

●Course Purpose

You will read textbooks and papers necessary for the advancement of research using the interaction between neutrons and radiation and nuclei. You will present the contents.Through these studies, you will gain the ability to understand the details of neutron and/or radiation measurement methods and application methods of their application.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Applied Energy Seminar 1D (2.0credits) (総合エネルギー工学セミナー1D)

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

●Course Purpose

By reviewing literature on radiation protection, environmental radioactivity and radiations, and global environmental problems related to energy usage, methodology and procedure of carrying out a research will be learned. Aim: Students are 1. to understand methodology of study on environmental radioactivity and radiation, radiation protection, natural material circulation, or isotope analysis, and to become able to carry out a study under supervision of teaching staff, 2 to understand fundamental sciences of global environmental problems and energy environmental safely, and to become able to rationally discuss typical examples of them.

●Prerequisite Subjects

Radiation and Health Physics, Nuclear Environmental Safety, Radiation Measurements, Isotope Analysis

●Course Topics

1. Radiation protection 2. Environmental radioactivity and radiation 3. Energy use-related environmental safety 4. Environmental transfer of materials: mechanisms and modeling5. Radiation measurements and isotope analysis

●Textbook

A textbook and research articles will be designated at the beginning.

●Additional Reading

none

●Grade Assessment

Achievement will be evaluated by oral presentation and discussion in the seminar. Minimum mark for credit is 60/100.

●Notes

●Contacting Faculty

ext. 3781 yamazawa@nagoya-u.jp, ext. 4695 tomita@nagoya-u.jp

Applied Energy Seminar 1D (2.0credits) (総合エネルギー工学セミナー1D)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Department of Applied Energy	
Starts 1	2 Autumn Semester	
Lecturer	"YAMAMOTO Akio" Professor	ENDO Tomohiro Associate Professor

●Course Purpose

The purpose of this study is to read the original papers on nuclear reactor physics and nuclear energy control engineering to learn the current status of research and to learn how to proceed and summarize the research.

The objectives of this lecture are as follows.
Understand and explain basic matters in a wide range of reactor physics and nuclear energy control engineering.
Point out the problems of previous research in specific fields of nuclear reactor physics and nuclear energy control engineering, and propose methodologies to solve them.

●Prerequisite Subjects

Reactor Physics

●Course Topics

1.Reactor design method
2.Sensitivity and uncertainty analysis
3.Optimization method
4.Nuclear safety
5.Criticality safety
6.Reactor noise diagnostics

Read relevant literature before the lecture and prepare for the lesson. After the lecture, review the contents of the lecture and check the examples again.

●Textbook

Introduce according to the content of the lecture.

●Additional Reading

Introduce according to the content of the lecture.

●Grade Assessment

Evaluate the level of achievement for the achievement target through reports and oral examinations during lectures. If you have a basic understanding of the content covered in this lecture, you will pass.

●Notes

According to Guidelines for Activities at Nagoya University During the Novel Coronavirus (COVID-19) Pandemic, face-to-face lectures may not be held.
In this case, the web lectures using "Zoom" instead of the face-to-face classes will be used.
The lecture's URL will be notified on NUCT (https://ct.nagoya-u.ac.jp/portal).

No registration requirements.

●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.

Contact: a-yamamoto[at]energy.(domain name of Nagoya University)

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.

Nuclear Safety Engineering (2.0credits) (原子力安全工学)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Lecture
Course Name	Department of Applied Energy
Starts 1	1 Autumn Semester
Lecturer	"YAMAMOTO Akio" Professor

●Course Purpose

The purpose of this lecture is to acquire systematic knowledge and ideas on nuclear safety. Implemented in a centralized format.

By learning this lecture, the goal is to acquire the following skills.
(1) Understand and apply basic matters of nuclear safety.
(2) Understand the outline of a nuclear power plant.
(3) Understand and apply the basic concept of nuclear safety.
(4) Understand safety design and safety evaluation methods.
(5) Understand the concept and outline of regulatory standards.
(6) Understand responses to external hazards.
(7) Understand the physics of severe accidents.
(8) Understand the outline of the nuclear accident.
(9) Understand the outline of nuclear disaster prevention.

●Prerequisite Subjects

There are no subjects that will serve as background for this lecture.

●Course Topics

1.Fundamentals of nuclear safety
2.Outline of nuclear power plants
3.Fundamental concepts in nuclear safety
4.Safety design and safety evaluations
5.Regulations and concepts
6.External hazards and countermeasures
7.Physics of severe accidents
8.Nuclear accidents
9.Emergency planning

Gather information in related fields before attending the course. After attending the course, review the contents of the lecture and confirm supplementary information on the examples discussed during the class.

●Textbook

Introduce as appropriate to the lecture.

●Additional Reading

Introduce as appropriate to the lecture.

●Grade Assessment

Evaluate the level of acquisition of achievement goals using reports. Pass if you have a basic understanding of nuclear safety.

●Notes

According to Guidelines for Activities at Nagoya University During the Novel Coronavirus (COVID-19) Pandemic, face-to-face lectures may not be held.
In this case, the web lectures using "Zoom" instead of the face-to-face classes will be used.

The lecture's URL will be notified on NUCT (https://ct.nagoya-u.ac.jp/portal).

No registration requirements.

●Contacting Faculty

Questions will be accepted during breaks after lectures or at any time. In the latter case, make an appointment in advance.
Contact: a-yamamoto[at]energy.(domain name of Nagoya University)

Fusion reactor system engineering (2.0credits) (核融合炉システム工学)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Department of Applied Energy		
Starts 1	Spring Semester ,every other year		
Lecturer	TakaakiFUJITA Professor	Takahiko SUGIYAMA Associate Professor	Atsushi OKAMOTO Associate Professor

●Course Purpose

The objectives of the present lecture are 1) to understand the significance of fusion reactor system development in energy problems, 2) to learn the outline of components of a fusion reactor such as core plasma, blanket, superconducting coil and materials, and 3) to study current status, problems and future perspective.
Goals and objectives are as follows.
1. To understand the basis of fusion reactor well enough to explain it in your words.
2. To understand core plasma of fusion reactor well enough to explain it in your words.
3. To understand key components of fusion reactor well enough to explain them in your words.

●Prerequisite Subjects

Mechanics, Electromagnetics, Plasma engineering and science, Nuclear fuel cycle engineering. Basic Engineering for Fusion Energy

●Course Topics

1. Introduction 2. Energy and environment 3. Principle of fusion reactor 4. Core plasma 5. Plasma heating 6. Plasma diagnosis and control 7. First wall and divertor 8. Blanket 9. Superconducting coil 10. Reactor materials and neutronics 11. Fuel cycle 12. Safety engineering 13. Design of fusion reactor 14. Development plan of fusion reactor 15. Future perspective

●Textbook

Not specified. Supplementary notes will be distributed during lecture.

●Additional Reading

●Grade Assessment

Reports.
Students need to obtain at least 60% of the total marks to pass the course.

●Notes

This course is given in person unless otherwise noted. If remote class is planned, it would be informed in NUCT.

●Contacting Faculty

fujita@energy.nagoya-u.ac.jp
a-okamoto@energy.nagoya-u.ac.jp
sugiyama@energy.nagoya-u.ac.jp

Process Systems Engineering For Energy Resources (2.0credits) (エネルギー資源プロセスシステム工学)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Department of Applied Energy	
Starts 1	1 Autumn Semester	
Lecturer	Youichi ENOKIDA Professor	Kayo SAWADA Associate Professor

●Course Purpose

This class is intended to master the most recent knowledge and to obtain ability of process systems analyses and design for the current and advanced processing of energy resources. Comprehensive ability is gained for the students who take this class through a few problem solving opportunities with reporting and communication skills are also cultivated by role-play exercise.

The final goals for the student who takes this class to achieve are obtaining the abilities of the following;
1) one can explain an example of process systems for energy resources,
2) one can evaluate unit cost of energy production with and without recycling energy resources,
3) one can explain an example of systematic management of hazardous waste,
4) one can explain an example of safety performance assessment of waste disposal system for the hazardous waste, and
5) one can implement and put risk communication into practice in his or her organization as well as understanding its principles and means.

●Prerequisite Subjects

No specific prerequisite subjects are requied, but 'Nuclear Fuel Cycle Engineering,' in the school of Engineering is preferable to master in undergraduate school education.

●Course Topics

1. Nuclear Fuel Cycle,
2. Process Systems in Nuclear Fuel Cycle,
3. Process Analysis on Nuclear Fuel Cycle,
4. Economics of Nuclear Fuel Cycle,
5. Process Analysis of Recycling,
6. Economics of Nuclear Fuel cycles,
7. Tehnologies for Nuclear Waste Management,
8. Conditioning and Packaging of Nuclear Wastes,
9. Performance Assessment of Nuclear Waste Disposal,
10. Recent Developments of Nuclear Waste processing Technology
11. Recent Developments of Nuclear Waste Dispodsal Technology,
12. Safety Analyses on a Nuclear Waste Processing Facility,
13. Risk Management and Comminucations,
14. Risk Communication exercise, and
15. Problem solving on process analyses practice.

●Textbook

R. G. Cockran et al., The Nuclear Fuel Cycle: Analysis and Management, American Nuclear Society (1999). Because the textbook is written in English and the reference data are collected in the United States of America, recent domestic situation and information are different from what are described; Students can read the textbook in the university library and may not be required to purchase it; the lecture materials are distributed in every lecture.

●Additional Reading

1) P. D. Wilson, The Nuclear Fuel Cycle from Ore to Waste, Oxford University Press (1996).
2) M. Benedict et al., Nuclear Chemical Engineering, McGraw-Hill (1982).
3) Recent academic papers related topics given in the class.

The above mentioned references are available to read in the University Library for advanced reading.

●Grade Assessment

Outcomes are evaluated on the final exam as 50%, reporting as 20%, role-play exercise as 30%. a student who marks greater than 60% pass the class. a student who has successfully solved an advanced problems appeared in the reporting exercises may gain additional points for evaluation.

Evaluation of grade will follow the standard provided by the Graduate School of Engineering.

●Notes

Attendance at risk communication exercise is essential to obtain credit of this course.

Attendance at every lecture is mandatory as well as keeping deadlines strictly for submission of a few reports.

[About the class in 2022]
Due to countermeasure against COVID-19, lectures in the current class will be given as distance learning, in principal, online or on-demand basis by an assist of NUCT, where MS power point files or YouTube videos are provided, you should download the specified files and watch or read them prior to each class. The preparation and review should be performed on NUCT's quiz or reporting features.

●Contacting Faculty

Please feel free to inquire on the lecture and problem solving by voice phone or e-mail in English or in Japanese, as follows;

Enokida
By phone; 052(789)5937 during office hours from 7:30 through 16:00,
By e-mail; yenokida@nagoya-u.jp.

Sawada
By phone; 052(747)6437 during office hours from 8:30 through 17:00,
By e-mail; k-sawada@imass.nagoya-u.ac.jp

Although it is not always, in some lectures are given by face to face especially for discussion between students, positive participation attitude is strongly encouragedand excercise on risk communication, which is scheduled on Decemver 6, 2021, is mondatory.

Energy Environmental Safety Engineering (2.0credits) (エネルギー環境安全工学)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Lecture
Course Name	Department of Applied Energy
Starts 1	1 Autumn Semester
Lecturer	Hiromi YAMAZAWA Professor

●Course Purpose

This lecture focuses on global to local scale environmental problems due to energy use including nuclear power, characteristics of environmental radioactivity and radiation, and safety analysis of radiological health effects.:Aim: Students are to become aware of and able to discus on :1. environmental issues due to energy consumption,:2. characteristics of environmental radioactivity, and:3. fundamental of nuclear disasters.

●Prerequisite Subjects

Radiation and Health Physics, Nuclear Environmental Safety, Radiation Measurements

●Course Topics

1. Environmental consequence of energy use:2. Characteristics of environmental radioactivity:3. Radiological dose evaluation:4. Nuclear accident and preparedness

●Textbook

Handout will be distributed. Students are requested to review the handout.

●Additional Reading

None

●Grade Assessment

Achievement of all three aims are evenly evaluated by reports on individual subject. Minimum mark for credit is 60/100.:

●Notes

●Contacting Faculty

ext. 3781 yamazawa@nagoya-u.jp

Energy Science (2.0credits) (エネルギー科学)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Lecture
Course Name	Department of Applied Energy
Starts 1	Spring Semester ,every other year
Lecturer	TakaakiFUJITA Professor

●Course Purpose

Review fundamental energy problems and understand status and future prospects of individual energy sources. In particular, understand mechanism of various engines and energy devices.

●Prerequisite Subjects

Mechanics, Electromagnetics, Thermodynamics, Fluid mechanics, Nuclear reactor physics, Nuclear fuel cycle engineering, plasma engineering and science

●Course Topics

1. Fundamentals of energy (concept, categorization, units)
2. Energy and environment (energy consumption, greenhouse effect)
3. Energy resources (fossil fuel, biomass)
4. Mechanical energy (hydraulic power, wind power)
5. Thermal energy (steam engine, combustion engine, heat pump, geothermal power)
6. Electric energy (three-phase current, generator, motor, power transmission)
7. Chemical energy (secondary battery, fuel cell, hydrogen)
8. Light energy (solar cell)
9. Nuclear energy (reactor, fuel cycle, fusion)

●Textbook

Not specified. Notes will be distributed during lecture.

●Additional Reading

●Grade Assessment

Reports.
Students need to obtain at least 60% of the total marks to pass the course.

●Notes

This course will not be given in 2022.

●Contacting Faculty

T. Fujita
Phone: 052-789-4593
E-mail: fujita@energy.nagoya-u.ac.jp

Fundamentals of fusion reactor materials and device engineering (2.0credits) (核融合炉材料・機器工学基礎論)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Department of Applied Energy	
Starts 1	1 Spring Semester	
Lecturer	Teruya TANAKA Associate Professor	Haruhisa NAKANO Associate Professor

●Course Purpose

The topics of the first half of the lecture are functions of fusion blanket systems, required materials (metals, liquid metals, molten salts, and ceramics) and issues in material use in fusion reactors. The lecture especially aims to understand fundamental mechanisms of material property changes under neutron irradiation environments.
The second half of the lecture starts with overview of fusion devices and properties of plasma, and especially explains plasma heating and diagnostic devices. The lecture aims to understand the perspective of fusion devices.

●Prerequisite Subjects

Electromagnetics, physical chemistry

●Course Topics

1. Overview of electric generation system for fusion reactors and reactor environment (Magnetic field, temperature, radiation)
2. Fundamental mechanisms of material property changes under neutron irradiation 3. Structural materials, Fuel breeder/coolant materials and functional materials for fusion reactors
4. Future prospects of development

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5. Overview of fusion devices
6. Properties of plasma
7. Overview of plasma heating devices
8. Overview of plasma diagnostic devices

●Textbook

Necessary materials will be distributed.

●Additional Reading

Nuclear Fusion Research II - Fusion Reactor Engineering (The University of Nagoya Press) in Japanese. (Necessary materials will be distributed.)

●Grade Assessment

Evaluated by attendance records and tests. A score higher than 60/100 is required for the credit.
C: 60-69, B: 70-79, A: 80-89, S: 90-100.

●Notes

No requirements for registration.

The class will be held online(Microsoft Teams). When it is changed to face-to-face etc., notified by NUCT.

●Contacting Faculty

Please contact T. Tanaka or H. Nakano
(tanaka.teruya@nifs.ac.jp or nakano.haruhisa@nifs.ac.jp)

Neutron and Nuclear Science (2.0credits) (中性子・原子核科学)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Department of Applied Energy	
Starts 1	Autumn Semester ,every other year	
Lecturer	Akira URITANI Professor	Sachiko YOSHIHASHI Associate Professor

●Course Purpose

You wil learn interactions between neutrons and matter, the basic properties of radiation, the decay of nuclei, the structure of nuclei and nuclear reactions. You will also learn about laser measurement and mass spectrometry techniques related to these.
Through these learnings, you can understand the basics of neutron and atomic/nuclear physics.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

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 Applied Energy
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), July 1998

●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.

Classes are conducted face-to-face or remotely, or in combination with face-to-face and remote.
Use NUCT for questions and exchange of opinions.

●Contacting Faculty

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

Instructor in charge: Prof. Akio Yamamoto
a-yamamoto[at]energy.nagoya-u.ac.jp

Special Lecture of Applied Energy Ⅰ (1.0credits) (総合エネルギー工学特別講義　Ⅰ)

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

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

●Prerequisite Subjects
General classes provided at undergraduate school of our department

●Course Topics
Lectures on recent topics related to the applied energy and engineering

●Textbook
Materials will be distributed during the class

●Additional Reading
References are introduced when necessary

●Grade Assessment
Report (60 points or more out of 100 points are passed)

●Notes
Classes will be conducted remotely (simultaneously bidirectionally).
Use NUCT for questions and exchange of opinions.

●Contacting Faculty
We accept questions during class or at office hours

Instructor in charge: Prof. Hiromi Yamazawa
yamazawa@nagoya-u.jp

Special Lecture of Applied Energy II (1.0credits) (総合エネルギー工学特別講義　II)

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

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

●Prerequisite Subjects
General classes provided in undergraduate school of our department

●Course Topics
Lectures on recent topics related to the applied energy and engineering

●Textbook
If specified, it will be notified by the notice of the start of the course (post).

●Additional Reading
References are introduced when necessary

●Grade Assessment
Reports (60% to pass)

●Notes
Classes are conducted face-to-face or remotely, or in combination with face-to-face and remote. Use NUCT for questions and exchange of opinions.

●Contacting Faculty
We accept questions during the class or at office hours.Instructor in charge: Prof. Hiromi Yamazawa yamazawa@nagoya-u.jp

Special Lecture of Applied Energy III (1.0credits) (総合エネルギー工学特別講義　III)

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

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

●Prerequisite Subjects
General classes provided in the undergraduate school of our department

●Course Topics
Lectures on recent topics related to the applied energy and engineering

●Textbook
Textbook will be specified when necessary.

●Additional Reading
References will be introduced when necessary.

●Grade Assessment
Reports (60% to pass)

●Notes
No special prerequisite for taking this course. Classes are conducted face-to-face or remotely, or in combination with face-to-face and remote. Use NUCT for questions and exchange of opinions.

●Contacting Faculty
We accept questions during class or at office hours.Instructor in charge: Prof. Akio Yamamotoa-yamamoto[at]energy.nagoya-u.ac.jp

Introduction to practical study for energy society (2.0credits) (エネルギー実学概論)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Department of Applied Energy	
Starts 1	1 Spring Semester	
Lecturer	Associated Faculty	Akira URITANI Professor Jun ONOE Professor

●Course Purpose

Since Japan is a resource-poor country, the energy problem is one of the most important issues related to the whole of Japanese society. When considering thermal, nuclear, renewable, and nuclear fusion energy as important power source candidates for Japan’s future needs, development in technology as well as the involvement of academic fields such as environmental studies, economics, law, sociology, and philosophy are, needless to say, but integral.
Therefore, it will be indispensable to develop human resources through transdisciplinary education, so we can more fully understand the influence of both the production and the consequence of Japan’s energy choices for today and in the future.
The purpose of this course is to acquire general, but multi-faceted knowledge of energy, environmental science, economics, law, sociology, and philosophy through lectures and group work by on-campus and off-campus instructors who are active on the front lines of their respective fields and to acquire basic skills of ability to extract and solve energy and social problems in 2050 from the prospective of SDGs-2030.

To acquire general yet multi-faceted knowledge of energetics, environmental studies, economics, law, sociology, and philosophy.
To acquire moderating, coordinating, and presenting skills through group work.
To extract the problems that can be expected in the energy using Japanese society of 2050 and to present the ideas toward their solutions from the perspective of the SDGs-2030.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Special Experiment of Applied Energy with Exercises A (1.0credits) (総合エネルギー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 Applied Energy
Starts 1	1 Spring Semester
Lecturer	TakaakiFUJITA Professor Atsushi OKAMOTO Associate Professor

●Course Purpose

Learn experiment or analysis methods related to plasma physics and nuclear fusion technology through individual research topics, and then cultivate reasearch ability.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Special Experiment of Applied Energy with Exercises A (1.0credits) (総合エネルギー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 Applied Energy	
Starts 1	1 Spring Semester	
Lecturer	Teruya TANAKA Associate Professor	Haruhisa NAKANO Associate Professor

●Course Purpose

In this course, exercise is performed for techniques of experiment, calculation and data analysis required for conduct of engineering studied for fusion power generation. The course aims to obtain fundamental experiment and calculation abilities required for solving physical/engineering issues.

●Prerequisite Subjects

Electromagnetics, plasma engineering, mechanics, physical chemistry, related fundamental physics

●Course Topics

1. Principles and use of experimental, measurement and analyzing apparatuses for fusion engineering research
2. Use of calculation codes and programming techniques
3. Setting of experimental conditions based on quantitative investigation
4. Conduct of experiment and calculation, and analysis methods of results
5. Preparation of drawings, graphs, figures, and presentation materials

Preparation is required for assigned subjects.

●Textbook

Information on textbooks and papers to be read will be provided.

●Additional Reading

Information on textbooks and papers to be read will be provided.

●Grade Assessment

Presentation and/or oral examination
A score higher than 60/100 is required for the credit.
C: 60-69, B: 70-79, A: 80-89, S: 90-100.

●Notes

No requirements for registration.

●Contacting Faculty

Responded by mails or discussion (in person or online).

Special Experiment of Applied Energy with Exercises A (1.0credits) (総合エネルギー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 Applied Energy		
Starts 1	1 Spring Semester		
Lecturer	Youichi ENOKIDA Professor	Takahiko SUGIYAMA Associate Professor	Kayo SAWADA Associate Professor
	Akira KUWAHARA Assistant Professor		

●Course Purpose

The objective is to learn and master experimental or analytical method for advanced research topics related to Energy Resources Recycling Engineering. That is a student will obtain through the research activities concerning to the topics the applied skills and creativity, which are educational goals at the Department of Applied Energy are obtained. The final goal of this class is obtaining solving ability for the actual research problem, and therfore he or she will be able to resolve one's research problem concerning to Energy Resources Recycling Engineeringwith obtained skills in this class.

●Prerequisite Subjects

Physical Chemistry, Fundamental Chemistry 2, Nuclear Fuel Cycle Engineering

●Course Topics

In this class, exercise by research experiments or systems simulation is discussed and a student should perform it for advanced research topics related to Energy Resources Recycling Engineering. The contents includes;1) comprehensive literature survey on previous related investigations,2) discuss and propose a new experimental research approach to solve the research problem,3) discuss and propose a new modelling research approach to solve the research problem4) perform experimental or modelling research,5) discussion on research results, and6) Preparation of technical reports.A student who takes this class should prepare written materials which discusses one of the above-mentioned topics according to the advancement of the class. After the class, the student should add some analyses and modified the materials so as to reflect the discussion given in the class, which should be submitted as a report not later than the following class.

●Textbook

No specific textbook is required. According to the advancement of the class, recent academic papers on Energy Resources Recycling Engineering are distributed as a course materials so as to follow-up the lecture contents shown in the Topics.

●Additional Reading

According to the advancement of the class, previous academic papers on Energy Resources Recycling Engineering as references are distributed as a course materials so as to follow-up the lecture contents shown in the Topics.

●Grade Assessment

Achievement and outcomes concerning to the final goal of the class evaluated by oral presentation(50%) and reports(50%). Evaluation of grade will follow the standard provided by the Graduate School of Engineering. Obtaining 'A+(S)' grade is granted for a student who has had an oral presentation at an international conference or authored an academic paper to be published in a periodical academic journal or equivalent during the semester.

●Notes

Credit of Nuclear Fuel Cycle Engineering or equivalent should have been earned in Undergraduated School Education. Otherwise, a short course of mandatory class will be given to the students.Additionally, A student who take this class must have enough knowledge on laboratory safety, and hold an own laboratory notebook.

●Contacting Faculty

Please feel free to inquire on the lecture and problem solving by voice phone or e-mail in English or in Japanese, as follows;By phone; 052(789)5937 during office hours from 7:30 through 16:00,By e-mail; yenokida@nagoya-u.jp.

Special Experiment of Applied Energy with Exercises A (1.0credits) (総合エネルギー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 Applied Energy		
Starts 1	1 Spring Semester		
Lecturer	Akira URITANI Professor	Sachiko YOSHIHASHI Associate Professor	Atsushi YAMAZAKI Assistant Professor

●Course Purpose

You will acquire experimental, computational, and analytical techniques for cutting-edge research related to radiation measurement and radiation application through graduate students' own research projects. You must make an oral presentation on the results obtained.Through these studies, you can acquire applied and creative skills.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Special Experiment of Applied Energy with Exercises A (1.0credits) (総合エネルギー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 Applied Energy	
Starts 1	1 Spring Semester	
Lecturer	Hiromi YAMAZAWA Professor	Hideki TOMITA Associate Professor

●Course Purpose

Experiments and exercises include items on local to global environmental problems due to energy consumption, on environmental radiation/radioactivity, and on safely evaluation of health-physical consequence of radiation, and on applications of radiation/isotope.
Aim:
1. To understand environmental problems due to energy consumption.
2. To understand characteristics of environmental radioactivity/radiation and to be able to evaluate radiological doses.
3. To understand and to carry out radiation measurements or isotope analysis.

●Prerequisite Subjects

Radiation and Health Physics, Nuclear Environmental Safety, Radiation Measurements, Isotope Analysis

●Course Topics

1. Measurement of environmental radioactivities and numerical simulation of their behaviors.:2. Measurements and analysis of carbon cycle.:3. Measurements of environmental pollutants and meteorological observation.:4. Learning and improvement of other measurement methods for radiation and radio/stable isotope

●Textbook

No specific textbook. Comprehensive review of related literature is essential.

●Additional Reading

None

●Grade Assessment

The weight of each aim is even. Report of exercise for each subject is to be assessed. Minimum mark for credit is 60/100.:

●Notes

●Contacting Faculty

ext.37814695

Special Experiment of Applied Energy with Exercises A (1.0credits) (総合エネルギー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 Applied Energy	
Starts 1	1 Spring Semester	
Lecturer	"YAMAMOTO Akio" Professor	ENDO Tomohiro Associate Professor

●Course Purpose

The purpose is to acquire experimental and analytical techniques for cutting-edge research related to integrated energy engineering through their own research subjects, and to acquire application and creativity through these studies.

The objectives of this experiment and exercise are as follows.
Understand and apply the basics of experimental technology according to the research theme.
Understand and apply the basics of analysis technology according to the research theme.

●Prerequisite Subjects

Reactor physics

●Course Topics

Perform experiments or exercises related to integrated energy engineering according to the research theme.

Before conducting experiments / exercises, work on research subjects and prepare documents on their progress. After the experiment / practice, respond to comments from faculty members or students who participated in the experiment / practice.

●Textbook

Introduce as necessary.

●Additional Reading

Introduce as necessary.

●Grade Assessment

Evaluate the level of achievement for the achievement target through reports and oral examinations during lectures. If you have a basic understanding of the content covered in this lecture, you will pass.

●Notes

According to Guidelines for Activities at Nagoya University During the Novel Coronavirus (COVID-19) Pandemic, face-to-face lectures may not be held.
In this case, the web lectures using "Zoom" instead of the face-to-face classes will be used.
The lecture's URL will be notified on NUCT (https://ct.nagoya-u.ac.jp/portal).

No registration requirements.

●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.

Contact: a-yamamoto[at]energy.(domain name of Nagoya University)

Special Experiment of Applied Energy with Exercises B (1.0credits) (総合エネルギー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 Applied Energy
Starts 1	1 Autumn Semester
Lecturer	TakaakiFUJITA Professor Atsushi OKAMOTO Associate Professor

●Course Purpose

Learn experiment or analysis methods related to plasma physics and nuclear fusion technology through individual research topics, and then cultivate reasearch ability.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Special Experiment of Applied Energy with Exercises B (1.0credits) (総合エネルギー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 Applied Energy	
Starts 1	1 Autumn Semester	
Lecturer	Teruya TANAKA Associate Professor	Haruhisa NAKANO Associate Professor

●Course Purpose

In this course, exercise is performed for techniques of experiment, calculation and data analysis required for conduct of engineering studied for fusion power generation. The course aims to obtain fundamental experiment and calculation abilities required for solving physical/engineering issues.

●Prerequisite Subjects

Electromagnetics, plasma engineering, mechanics, physical chemistry, related fundamental physics

●Course Topics

1. Principles and use of experimental, measurement and analyzing apparatuses for fusion engineering research
2. Use of calculation codes and programming techniques
3. Setting of experimental conditions based on quantitative investigation
4. Conduct of experiment and calculation, and analysis methods of results
5. Preparation of drawings, graphs, figures, and presentation materials

Preparation is required for assigned subjects.

●Textbook

Information on textbooks and papers to be read will be provided.

●Additional Reading

Information on textbooks and papers to be read will be provided.

●Grade Assessment

Presentation and/or oral examination
A score higher than 60/100 is required for the credit.
C: 60-69, B: 70-79, A: 80-89, S: 90-100.

●Notes

No requirements for registration.

●Contacting Faculty

Responded by mails or discussion (in person or online)

Special Experiment of Applied Energy with Exercises B (1.0credits) (総合エネルギー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 Applied Energy		
Starts 1	1 Autumn Semester		
Lecturer	Youichi ENOKIDA Professor	Takahiko SUGIYAMA Associate Professor	Kayo SAWADA Associate Professor
	Akira KUWAHARA Assistant Professor		

●Course Purpose

The objective is to learn and master experimental or analytical method for advanced research topics related to Energy Resources Recycling Engineering. That is a student will obtain through the research activities concerning to the topics the applied skills and creativity, which are educational goals at the Department of Applied Energy are obtained. The final goal of this class is obtaining solving ability for the actual research problem, and therfore he or she will be able to resolve one's research problem concerning to Energy Resources Recycling Engineeringwith obtained skills in this class.

●Prerequisite Subjects

Physical Chemistry, Fundamental Chemistry 2, Nuclear Fuel Cycle Engineering
Special Experiment of Applied Energy with Exercises A

●Course Topics

In this class, exercise by research experiments or systems simulation is discussed and a student should perform it for advanced research topics related to Energy Resources Recycling Engineering. The contents includes;
1) comprehensive literature survey on previous related investigations,
2) discuss and propose a new experimental research approach to solve the research problem,
3) discuss and propose a new modelling research approach to solve the research problem
4) perform experimental or modelling research,
5) discussion on research results, and
6) Preparation of technical reports.

A student who takes this class should prepare written materials which discusses one of the above-mentioned topics according to the advancement of the class. After the class, the student should add some analyses and modified the materials so as to reflect the discussion given in the class, which should be submitted as a report not later than the following class.

●Textbook

No specific textbook is required. According to the advancement of the class, recent academic papers on Energy Resources Recycling Engineering are distributed as a course materials so as to follow-up the lecture contents shown in the Topics.

●Additional Reading

According to the advancement of the class, previous academic papers on Energy Resources Recycling Engineering as references are distributed as a course materials so as to follow-up the lecture contents shown in the Topics.

●Grade Assessment

Achievement and outcomes concerning to the final goal of the class evaluated by oral presentation(50%) and reports(50%). Evaluation of grade will follow the standard provided by the Graduate School of Engineering. Obtaining 'A+(S)' grade is granted for a student who has had an oral presentation at an international conference or authored an academic paper to be published in a periodical academic journal or equivalent during the semester.

●Notes

Credit of special experiment of Applied Energy with Excercise A should have been earned.

●Contacting Faculty

Please feel free to inquire on the lecture and problem solving by voice phone or e-mail in English or in Japanese, as follows;

By phone; 052(789)5937 during office hours from 7:30 through 16:00,
By e-mail; yenokida@nagoya-u.jp.

Special Experiment of Applied Energy with Exercises B (1.0credits) (総合エネルギー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 Applied Energy		
Starts 1	1 Autumn Semester		
Lecturer	Akira URITANI Professor	Sachiko YOSHIHASHI Associate Professor	Atsushi YAMAZAKI Assistant Professor

●Course Purpose

You will acquire experimental, computational, and analytical techniques for cutting-edge research related to radiation measurement and radiation application through graduate students' own research projects. You must make an oral presentation on the results obtained.Through these studies, you can acquire applied and creative skills.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Special Experiment of Applied Energy with Exercises B (1.0credits) (総合エネルギー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 Applied Energy	
Starts 1	1 Autumn Semester	
Lecturer	Hiromi YAMAZAWA Professor	Hideki TOMITA Associate Professor

●Course Purpose

Experiments and exercises include items on local to global environmental problems due to energy consumption, on environmental radiation/radioactivity, and on safely evaluation of health-physical consequence of radiation, and on applications of radiation/isotope. Aim: 1. To understand environmental problems due to energy consumption.2. To understand characteristics of environmental radioactivity/radiation and to be able to evaluate radiological doses.3. To understand and to carry out radiation measurements or isotope analysis.

●Prerequisite Subjects

Radiation and Health Physics, Nuclear Environmental Safety, Radiation Measurements, Isotope Analysis

●Course Topics

1. Measurement of environmental radioactivities and numerical simulation of their behaviors.:2. Measurements and analysis of carbon cycle.:3. Measurements of environmental pollutants and meteorological observation.:4. Learning and improvement of other measurement methods for radiation and radio/stable isotope

●Textbook

No specific textbook. Comprehensive review of related literature is essential

●Additional Reading

none

●Grade Assessment

The weight of each aim is even. Report of exercise for each subject is to be assessed. Minimum mark for credit is 60/100.

●Notes

●Contacting Faculty

ext.37814695

Special Experiment of Applied Energy with Exercises B (1.0credits) (総合エネルギー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 Applied Energy	
Starts 1	1 Autumn Semester	
Lecturer	"YAMAMOTO Akio" Professor	ENDO Tomohiro Associate Professor

●Course Purpose

The purpose is to acquire experimental and analytical techniques for cutting-edge research related to integrated energy engineering through their own research subjects, and to acquire application and creativity through these studies.

The objectives of this experiment and exercise are as follows.
Understand and apply the basics of experimental technology according to the research theme.
Understand and apply the basics of analysis technology according to the research theme.

●Prerequisite Subjects

Reactor physics

●Course Topics

Perform experiments or exercises related to integrated energy engineering according to the research theme.

Before conducting experiments / exercises, work on research subjects and prepare documents on their progress. After the experiment / practice, respond to comments from faculty members or students who participated in the experiment / practice.

●Textbook

Introduce as necessary.

●Additional Reading

Introduce as necessary.

●Grade Assessment

Evaluate the level of achievement for the achievement target through reports and oral examinations during lectures. If you have a basic understanding of the content covered in this lecture, you will pass.

●Notes

According to Guidelines for Activities at Nagoya University During the Novel Coronavirus (COVID-19) Pandemic, face-to-face lectures may not be held.
In this case, the web lectures using "Zoom" instead of the face-to-face classes will be used.
The lecture's URL will be notified on NUCT (https://ct.nagoya-u.ac.jp/portal).

No registration requirements.

●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.

Contact: a-yamamoto[at]energy.(domain name of Nagoya University)

Nuclear Reactor Laboratory (2.0credits) (原子炉実験)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Experiment	
Course Name	Department of Applied Energy	
Starts 1	1 Spring Semester	
Lecturer	"YAMAMOTO Akio" Professor	ENDO Tomohiro Associate Professor

●Course Purpose

Through the fundamental experiments using a critical assembly (low-power, small nuclear reactor), this lecture aims to learn the basic experimental techniques on reactor physics experiment. Furthermore, we expect that graduate students deepen their understanding of the critical state in the nuclear reactor thanks to these experiments and reactor operation. This nuclear reactor laboratory course will be conducted intensively for a week as a joint program consisting of other universities to produce the students' synergistic effect.

By acquiring the contents in this lecture, we expect students are able to understand the following topics:
• Prediction of criticality mass of nuclear reactor
• Calculation of reactivity change via control rod operation
• Measurement of spatial distribution of thermal neutron flux in nuclear reactor
• Adjustment of fission power in nuclear reactor and keeping the critical state by control rod operation

●Prerequisite Subjects

Reactor Physics, Radiation Metrology A

●Course Topics

The contents in the reactor physics experiments are as follows:
(1) Criticality approach
(2) Control rod calibration
(3) Subcriticality measurement

Before attending the reactor physics experiments, graduate students should make preliminary reports to prepare these experiments.

●Textbook

T. Misawa, C.H. Pyeon, H. Unesaki, Nuclear Reactor Physics Experiments, Kyoto University Press (2010).

●Additional Reading

J.R. Lamarsh, Introduction to Nuclear Reactor Theory, Am. Nucl. Soc. (2002).

●Grade Assessment

Preliminary report (30%), experimental report (70%). The passing mark is 60 points out of 100.

●Notes

Participating graduate students should be a Radiation user in Nagoya University.

According to Guidelines for Activities at Nagoya University During the Novel Coronavirus (COVID-19) Pandemic, face-to-face lectures will not be held.
In this case, I will held the web lectures using "Zoom" instead of the face-to-face classes.
The lecture's URL will be made known through NUCT (https://ct.nagoya-u.ac.jp/portal).
The first orientation will be held via zoom on April 15th (13:00-).

●Contacting Faculty

Anytime, contact via e-mail.
e-mailt-endo*energy.nagoya-u.ac.jp

Note: Please replace * with @.

Reactor Design with Exercises (1.0credits) (原子炉設計および演習)

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

●Course Purpose

The purpose is to be able to understand and understand the nuclear power plant as a whole through design exercises of the nuclear power plant. In order to understand a nuclear power plant as one system, rather than gaining knowledge of individual and various facilities installed in actual equipment, the framework based on what kind of concept is being designed as a whole should be understood. It is important to learn.

Therefore, the following are the goals to be achieved in this exercise.
Basic parameters such as critical output, required control output, heat transfer, cooling performance, mechanical integrity, power generation efficiency, safety system capacity, etc. All can be calculated manually without using it.
Understand the organic connection of each part of the plant through the above analysis.

●Prerequisite Subjects

Basic knowledge of nuclear plant engineering, nuclear fuel engineering, thermal dynamics engineering are desirable.

●Course Topics

Assuming a light water reactor as an analysis target, the following analysis is performed with electric power and core life as given conditions.
Coolant pressure, inlet / outlet temperature setting
Evaluation of power generation efficiency, heat balance calculation of entire plant
Setting of fuel heat transfer area
Setting of fuel rod diameter and number of fuel rods by heat transfer calculation
Setting of output density
Calculation of enrichment and number of new fuel replacement bodies
Calculation of required control reactivity
Calculation of source terms that are important for safety
Capacity of safety system in typical accident sequence such as LOCA
Calculation such as setting of alternative water injection amount when total water supply is lost

Please confirm the materials to be distributed before the exercise. Group exercises are conducted in a three-day intensive format, and on the last day, the results of the exercises are presented for each group. After the exercise, review the content based on the presentation on the last day.

●Textbook

Introduce as necessary

●Additional Reading

Introduce as necessary

●Grade Assessment

The degree of acquisition of the goal of this exercise is evaluated based on oral examinations, exercise results, and pre-tension during the exercise. A pass is made if the basic specifications of the reactor can be set from the presented prerequisites.

●Notes

No special prerequisite for taking this class.

Classes are conducted face-to-face or remotely, or in combination with face-to-face and remote.
Use NUCT for questions and exchange of opinions.

●Contacting Faculty

Accept questions from time to time

Instructor in charge: Prof. Akio Yamamoto
a-yamamoto[at]energy.nagoya-u.ac.jp

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 researchers
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.

This lecture will be given in an on-demand format using NUCT. In each lecture (1st lecture: Apr. 11), the course materials should be downloaded from the NUCT. If you cannot access the NUCT site of this lecture, please contact the instructor (Kishida, kishida@nagoya-u.jp) by e-mail with your name and student number. Even in this case, the registration is required.

●Contacting Faculty

After each class student can ask questions through the message function of NUCT.
Otherwise, contact to:
Prof. Kishida kishida@nagoya-u.jp

The exchange of opinions among the students can be made through the message function of NUCT.

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

According to Guidelines for Activities at Nagoya University During the Novel Coronavirus (COVID-19) Pandemic, face-to-face lectures may not be held.
In this case, the web lectures using "Zoom" instead of the face-to-face classes will be used.
The lecture's URL will be notified on NUCT (https://ct.nagoya-u.ac.jp/portal).

No registration requirements.

●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.

Contact: a-yamamoto[at]energy.(domain name of Nagoya University)

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.

Advanced Lectures on Frontier Technologies and Sciences (1.0credits) (最先端理工学特論)

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	
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

Participate in the VBL Symposium held around November, attend supplementary lectures, and submit a report.

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.

Important Notes
Students who wish to take the course will be able to register for the "Advanced Lectures on Frontier Technologies and Sciences" at NUCT after they have registered for the course.
Note that all contacts from NUCT are available for the lectures.
Students who missed the registration period should register the page of "Advanced Lectures on Frontier Technologies and Sciences" on the NUCT website.

●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

In order to advance research in engineering, it is necessary to learn about the latest research trends through practice. The purpose of this experiment is to conduct research experiments using the most advanced experimental equipment and simulators. Through this experiment, students will be able to understand the principles and learn how to use the equipment owned by VBL (maskless exposure system, dry etching system, atomic layer deposition system, metal deposition system) and device simulators. In addition, the goal is to comprehensively acquire knowledge and skills related to advanced experiments and presentation techniques for the assigned research by reporting the results.

●Prerequisite Subjects

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

●Course Topics

The experiment will be conducted at the Venture Business Laboratory building.
The report meeting will be held online or at the above building.
If you choose an assigned experiment with a predetermined task, the required curriculum includes the use of either a maskless exposure system, ICP etching system, or atomic layer deposition system. Students will use these devices to perform their assignments and learn the principles and practical use of these devices. In the case of experiments proposed by the students (original experiments), the students will propose their own device simulation experiments and research using the above equipment, and work with the instructor to produce experimental results. In the end, students will organize and discuss the results, present their findings, and learn how to practically use state-of-the-art equipment and simulation skills.

Students should learn the basic knowledge of the research they are assigned.

●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
Course Registration
No course requirements.
The number of registered students should be about 10.

Important Notes
Students who wish to take the course will be able to register for the "Advanced Experiments for Frontier Technologies and Sciences" at NUCT after they have registered for the course.
Note that all contacts from NUCT are available for the lectures.
Students who missed the registration period should register the page of "Advanced Experiments for Frontier Technologies and Sciences" on the NUCT website.

●Contacting Faculty
We will respond via NUCT's message system and e-mail.

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

Textbooks and references are not assigned for this class. However, depending on the student and class progress, necessary materials 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.
This class will be held face to face unless there are international students who cannot come to Japan.

●Contacting Faculty

Questions will be answered before class, in class, after class or by e-mail.
E-mail address　o47251a@cc.nagoya-u.ac.jp

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
The lecturer will answer questions about the content of the lesson, and the instructor in charge will answer other questions.

ysakai@mech.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 course aims to help students write a well-structured research paper in English and expand their vocabulary and expression list relating to academic writing.
By the end of the course, students will be able to:
- explain the basic structure of a research paper
- explain the characteristics of each component
- use vocabulary adequately
- use expressions adequately
- choose the most relevant citation style
- write a mini research paper

●Prerequisite Subjects

"English (basic)" and "English (intermediate)" (or equivalent)

●Course Topics

English is the language of instruction in this course.
After reviewing the basics of academic writing, students will understand the fundamental structure of the research paper. Students will improve their vocabulary and expressions to write a well-structured paper as they analyze sample research papers. Additionally, students will understand the citation styles by exploring the descriptions in the instructions for authors in the academic journals of their choice. In the classroom activities, students will exchange ideas, give an oral presentation, practice their writing skills, and give feedback to each other.
1. Basics of academic writing in English 1: Paragraph writing
2. Basics of academic writing in English 2: Making an outline
3. Fundamental structure of research paper: Structural analysis

4. Oral presentation: Journals, instructions for authors, and citation styles
5. Writing 1: Title and abstract
6. Writing 2: Research method
7. Writing 3: Results and discussions
8. Writing 4: Introduction and conclusion

●Textbook

No textbook for this class. Handouts will be distributed in class.

●Additional Reading

Glasman-Deal, H. (2021). Science Research Writing: For Non-Native Speakers of English. Imperial College Press.
Paltridge, B. (2019). Thesis and Dissertation Writing in a Second Language. Routledge.
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

The following evaluation items constitute the maximum score of 100:
Class Participation (25%)
Homework Assignments (35%)
Oral Presentation (10%)
Mini-Research Paper (30%)
A student must evidence a total score of 60 or higher on the final grading scale to pass this course.

●Notes

-No prerequisite.
-There is a chance to redesign the class format, schedule, and grading system depending on the COVID-19 situation.
-There will be approximately six face-to-face classes and two online (synchronous or on-demand) classes.
-Online, synchronous classes will be given on Zoom, whereas the on-demand classes will be given on NUCT.
-The first class will be met face-to-face in the regular classroom on campus, and the class format in the remaining semester will be announced via "Messages" on NUCT.
-Students are expected to express/exchange their ideas and opinions on NUCT and/or on another interactive presentation system to be announced in class.
-An active dialog is highly valued in this class, so your enthusiastic participation is vital to the success of your learning.
-Basically, homework is assigned on a weekly basis.

●Contacting Faculty

Use the "Messages" tool on NUCT to contact the instructor. Only for a limited period of time (until the secondary course registration period ends), you can reach the instructor by email.
smrym(at)lets.chukyo-u.ac.jp
Please replace (at) with @, the at symbol.

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

Through the trend and environment of venture business in our country, we will consider what is necessary to actually and personally launch a venture business.

1. commercialization and entrepreneurship Why venture business ---Risks and advantages
2. knowledge and preparation for commercialization and entrepreneurship ---points to keep in mind as an engineer/researcher
3. from university research to commercialization/start-up --- how to proceed with R&D in a company
4. promotion of commercialization ---negotiations and market research for commercialization ----.
5. innovation theory
6. case studies in the mobility field
7. biotechnology and medical fields
8. case studies in the field of electronic devices
9. technology management (patents, etc.)
10. summary

A report will be assigned, so students should identify and discuss their own interests and issues while attending the lecture.

●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.

Important Notes
Students who wish to take the course will be able to register for the "Focus on Venture Business I" at NUCT after they have registered for the course.
Note that all contacts from NUCT are available for the lectures.
Students who missed the registration period should register the page of "Focus on Venture Business I" on the NUCT website.
In addition, all lectures will be conducted remotely using online conferencing tools.

●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.

Lectures will be held in a discussion style.
As a part of this, the maximum number of registered students will be set at 60.
If the number of registered students exceeds 60, students will be selected by lottery. The number of students will be determined by lottery.
Students who wish to take this course should first register at NUCT.
Information on the lottery will be sent to applicants via the NUCT lecture website.

However, students enrolled in the "DII Collaborative Graduate Program for Accelerating Innovation in Future Electronics " may take the course without a lottery.

●Prerequisite Subjects

●Course Topics

1. the japanese economy and venture business
2. current status of venture business
Venture and management strategy
Venture and marketing strategy
Venture Business and Corporate Accounting
Venture and financial strategy
7. case studies (emphasis on management strategy)

8. case study (focus on marketing strategy)
9. case study (focus on financial strategy)
10. case study (focus on capital policy: IPO company)
11. business plan business idea and competitive advantage
Business Plan Profitability Plan
13. business plan financial plan
Business Plan Business Plan Operation and Summary
15. summary

It is necessary for future businesses to research and understand various literature and online information regarding the lecture content.

●Textbook

●Additional Reading

●Grade Assessment

●Notes

Lectures will be held in a discussion style.
As a part of this, the maximum number of registered students will be set at 60.
If the number of registered students exceeds 60, students will be selected by lottery. The number of students will be determined by lottery.
Students who wish to take this course should first register at NUCT.
Information on the lottery will be sent to applicants via the NUCT lecture website.

However, students enrolled in the "DII Collaborative Graduate Program for Accelerating Innovation in Future Electronics " may take the course without a lottery.

●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 Applied Energy
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
All science and engineering subjects are required.
Experience in performing work and writing reports in experimental subjects is useful.

●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
It may be specified by the company after the partner company is decided.

●Additional Reading
It may be specified by the company after the partner company is decided.

●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
Since the content and timing of the implementation will differ depending on the partner company, please discuss the schedule with your academic advisor before taking the course.
Confidentiality may be imposed on the content, so follow the relevant instructions. Also, take a web course on research ethics.

●Contacting Faculty
Please consult with the instructor regarding the method of attending and application.
Contact the person in charge at the company for the content of the lecture.

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 Applied Energy
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

All science and engineering subjects are required.Experience in performing work and writing reports in experimental subjects is useful.

●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

It may be specified by the company after the partner company is decided.

●Additional Reading

It may be specified by the company after the partner company is decided.

●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

Since the content and timing of the implementation will differ depending on the partner company, please discuss the schedule with your academic advisor before taking the course.Confidentiality may be imposed on the content, so follow the relevant instructions. Also, take a web course on research ethics.

●Contacting Faculty

Please consult with the instructor regarding the method of attending and application.Contact the person in charge at the company for the content of the lecture.

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	Tatsuya SUZUKI Professor	Takeshi KATAKAI Designated Associate Professor	JIANG Meilan Designated Lecturer
	Eiji ABE Assistant Professor	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

Mail to:katakai@coi.nagoya-u.ac.jp

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

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 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	Tatsuya SUZUKI Professor	Takeshi KATAKAI Designated Associate Professor	JIANG Meilan Designated Lecturer
	Eiji ABE Assistant Professor	Faculty of Advanced Mobility Program	

●Course Purpose

To train the students who can play an active role in the mobility industry or research institute. To provide break down study on the EV using commercial electric vehicles and a university formula car. After understanding the mechanism of the EV structure, to produce a mini car for automatic driving. Students themselves will build a software system that realizes a basic automatic driving such as lane tracking. This course is organized as follows:1. Learn the basics of technological development in the mobility industry2. Understand the structure and driving mechanism of electric vehicles3. Understanding autonomous driving technology through the production of a mini cars for autonomous driving4. Understand the software architecture for autonomous driving5. Understand cognition technology for lane detection / follow-up control and on-board installation6. Understand control technology for obstacle detection / avoidance and on-board installation

●Prerequisite Subjects

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

●Course Topics

After experiencing the break down study using commercial EV and an electric formula car, produce a mini car for autonomous driving and develop autonomous driving algorithm. After learning the basic movements of running, turning, and stopping, develop lane tracing algorithm to follow the white line by image recognition. A contest will be held at the end of the training. A special certificate will be issued to students who have completed the prescribed grades in this course. The content of the class is as follows.1. Electric vehicle structure and running mechanism2. Vehicle characteristic analysis and improvement methods3. Examination of software architecture for autonomous driving4. Understand and implement cognition technology for lane detection5. Understand and implement control technology for follow-up control6. Understand control technology for obstacle detection / avoidance

●Textbook

Original lecture note will be provided.

●Additional Reading

It will be announced in the class if necessary.

●Grade Assessment

Evaluation is based on the student's effort for solving the tasks, total score of reports, 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

Mail to:katakai@coi.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.

Applied Energy Seminar 2A (2.0credits) (総合エネルギー工学セミナー2A)

Course Type	Specialized Courses
Division at course	Doctor's Course
Class Format	Seminar
Course Name	Department of Applied Energy
Starts 1	1 Spring Semester
Lecturer	TakaakiFUJITA Professor Atsushi OKAMOTO Associate Professor

●Course Purpose

Lecturing in turn on textbooks or papers on plasma physics and nuclear fusion.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Applied Energy Seminar 2A (2.0credits) (総合エネルギー工学セミナー2A)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Department of Applied Energy	
Starts 1	1 Spring Semester	
Lecturer	Teruya TANAKA Associate Professor	Haruhisa NAKANO Associate Professor

●Course Purpose

In this seminar, understanding of status and issues in engineering studies for fusion power generation are conducted first, and then studying method and process for solving the issues, consideration on obtained data and conclusion of the study are reviewed and discussed. The seminar aims to obtain fundamental abilities to solve physical/engineering issues independently.

●Prerequisite Subjects

Electromagnetics, plasma engineering, mechanics, physical chemistry, related fundamental physics

●Course Topics

1) Components and materials required for fusion power generation and issues
2) Consideration of experimental and calculation methods to solve issues
3) Understanding and discussion on obtained experimental and calculated data
4) Conclusion extracted from obtained results
Preparation is required for assigned documents and issues to be investigated.

●Textbook

Information on textbooks and papers to be read will be provided.

●Additional Reading

1)F. F. Chen, "Introduction to Plasma Physics and Controlled Fusion", Third Edition, Springer 2016.
2)R. Goldston, H.P. Rutherford, "Introduction to Plasma Physics", IOP Publishing 1995.
3)Nuclear Fusion Research II - Fusion Reactor Engineering (The University of Nagoya Press) in Japanese.
(Necessary materials will be distributed.)

●Grade Assessment

Presentation and/or oral examination
A score higher than 60/100 is required for the credit.
C: 60-69, B: 70-79, A: 80-89, S: 90-100.

●Notes

No requirements for registration.

●Contacting Faculty

Responded by mails or discussion (in person or online).

Applied Energy Seminar 2A (2.0credits) (総合エネルギー工学セミナー2A)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Department of Applied Energy		
Starts 1	1 Spring Semester		
Lecturer	Youichi ENOKIDA Professor	Takahiko SUGIYAMA Associate Professor	Kayo SAWADA Associate Professor
	Akira KUWAHARA Assistant Professor		

●Course Purpose

This seminar aims at gaining an ability of formal written and oral presentations of study proposal and actual performing theoretical and experimental process analyses on the proposed study to master the essential ability as a master course student in the Department of Applied Energy.Additionally participants are required to cultivate fundamental knowledge on research safety and ethics, and should complete taking research notes in an adequate manner as a part of researcher's fundamentals.A student can expect obtaining ability of research planning, performing, and presentation of the results at an academic meeting or submission of a research paper.

●Prerequisite Subjects

1) Nuclear Fuel Cycle Engineering, 2) Process Systems Engineering for Energy Resources

●Course Topics

1. Literature survey on previous studies concerning to Energy Resources Recycling Engineering,2. Proposal and planning of a study on Energy Resources Recycling Engineering,3. Theoretical analysis on the proposed study,4. Experimental analysis on the proposed study,5. Oral presentation on the research results, and6. Technical writing on the research results.Before each class of the seminar, a student take this class should write on his or her research note summaries of results on literature survey, research activity, and discussion on the results, which are reported in the seminar.

●Textbook

1) M. Faraday, "Faraday's Diary of Experimental Investigation Vol.1-7," HI Direct (2008).2) According with the advancement of research plan, the other textbooks or research papers are to be suggested.

●Additional Reading

Y. Okazaki, 'How to write laboratory note,' Yodosya (2013)

●Grade Assessment

Oral presentation at each seminar(60%) and oral presentation at the academic meeting or paper submission(40%)A student pass the class by achieving the each content of the class. Extra outcomes such as presentation at the academic meeting or submitting a research paper is considered for additional points. Evaluation of grade will follow the standard provided by the Graduate School of Engineering. Obtaining 'A+ (S)' grade is granted for a student who has had an oral presentation at an international conference or authored an academic paper to be published in a periodical academic journal or equivalent during the semester.

●Notes

redits of Applied Energy Seminar 1A, 1B, 1C, 1D, or equivalents should have been earned. A student who take this class must have enough knowledge on laboratory safety,and hold an own laboratory notebook.

●Contacting Faculty

Please feel free to inquire on the lecture and problem solving by voice phone or e-mail in English or in Japanese, as follows;By phone; 052(789)5937 during office hours from 7:30 through 16:00,By e-mail; yenokida@nagoya-u.jp.

Applied Energy Seminar 2A (2.0credits) (総合エネルギー工学セミナー2A)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Department of Applied Energy		
Starts 1	1 Spring Semester		
Lecturer	Akira URITANI Professor	Sachiko YOSHIHASHI Associate Professor	Atsushi YAMAZAKI Assistant Professor

●Course Purpose

You will read textbooks and papers necessary for the advancement of research using the interaction between neutrons and radiation and nuclei. You will present the contents.Through these learnings, you will be able to understand the details of neutron and radiation measurement methods and the application methods of their utilization techniques, and acquire the advanced ability to create.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Applied Energy Seminar 2A (2.0credits) (総合エネルギー工学セミナー2A)

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

●Course Purpose

By being given sub-themes which constitute the doctoral dissertation, students are requested to review literature and to carry out experimental and theoretical study in order to develop capability of finding and solving problems, controlling progress of study and tackling problems with original and innovative ideas

●Prerequisite Subjects

Radiation and Health Physics, Nuclear Environmental Safety, Radiation Measurements, Isotope Analysis

●Course Topics

The seminar includes reviewing of literatures relevant to the doctoral dissertation in the following fields and discussion on the plan and progress of doctoral study.:1. Radiation protection:2. Environmental radioactivity and radiation:3. Energy use-related environmental safety: 4. Environmental transfer of materials and environmental problems: 5. Radiation measurements and isotope analysis

●Textbook

A textbook and research articles will be designated at the beginning.

●Additional Reading

none

●Grade Assessment

Achievement will be evaluated by oral presentation and discussion in the seminar. Minimum mark for credit is 60/100.

●Notes

●Contacting Faculty

ext. 3781 yamazawa@nagoya-u.jp,
ext. 4695 tomita@nagoya-u.jp

Applied Energy Seminar 2A (2.0credits) (総合エネルギー工学セミナー2A)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Department of Applied Energy	
Starts 1	1 Spring Semester	
Lecturer	"YAMAMOTO Akio" Professor	ENDO Tomohiro Associate Professor

●Course Purpose

The purpose of this course is to develop problem-finding and original problem-solving skills and to train convincing expressions through resolving original dissertations on doctoral dissertations.

The objectives of this lecture are as follows.
Discover problems to be solved in specific fields of nuclear energy control engineering.
Provide an original problem solving approach for the problem to be solved.
Can communicate research results accurately and easily.

●Prerequisite Subjects

Applied energy seminar 1A, 1B, 1C, 1D, Nuclear Safety

●Course Topics

1.Reactor design method
2.Sensitivity and uncertainty analysis
3.Optimization method
4.Nuclear safety
5.Criticality safety
6.Reactor noise diagnostics

Read relevant literature before the lecture and prepare for the lesson. After the lecture, review the contents of the lecture and check the examples again.

●Textbook

Introduce according to the content of the lecture.

●Additional Reading

Introduce according to the content of the lecture.

●Grade Assessment

Evaluate the level of achievement for the achievement target through reports and oral examinations during lectures. If you have a basic understanding of the content covered in this lecture, you will pass.

●Notes

According to Guidelines for Activities at Nagoya University During the Novel Coronavirus (COVID-19) Pandemic, face-to-face lectures may not be held.
In this case, the web lectures using "Zoom" instead of the face-to-face classes will be used.
The lecture's URL will be notified on NUCT (https://ct.nagoya-u.ac.jp/portal).

No registration requirements.

●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.

Contact: a-yamamoto[at]energy.(domain name of Nagoya University)

Applied Energy Seminar 2B (2.0credits) (総合エネルギー工学セミナー2B)

Course Type	Specialized Courses
Division at course	Doctor's Course
Class Format	Seminar
Course Name	Department of Applied Energy
Starts 1	1 Autumn Semester
Lecturer	TakaakiFUJITA Professor Atsushi OKAMOTO Associate Professor

●Course Purpose

Lecturing in turn on textbooks or papers on plasma physics and nuclear fusion.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Applied Energy Seminar 2B (2.0credits) (総合エネルギー工学セミナー2B)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Department of Applied Energy	
Starts 1	1 Autumn Semester	
Lecturer	Teruya TANAKA Associate Professor	Haruhisa NAKANO Associate Professor

●Course Purpose

In this seminar, understanding of status and issues in engineering studies for fusion power generation are conducted first, and then studying method and process for solving the issues, consideration on obtained data and conclusion of the study are reviewed and discussed. The seminar aims to obtain fundamental abilities to solve physical/engineering issues independently.

●Prerequisite Subjects

Electromagnetics, plasma engineering, mechanics, physical chemistry, related fundamental physics

●Course Topics

1) Components and materials required for fusion power generation and issues
2) Consideration of experimental and calculation methods to solve issues
3) Understanding and discussion on obtained experimental and calculated data
4) Conclusion extracted from obtained results
Preparation is required for assigned documents and issues to be investigated.

●Textbook

Information on textbooks and papers to be read will be provided.

●Additional Reading

1)F. F. Chen, "Introduction to Plasma Physics and Controlled Fusion", Third Edition, Springer 2016.
2)R. Goldston, H.P. Rutherford, "Introduction to Plasma Physics", IOP Publishing 1995.
3)Nuclear Fusion Research II - Fusion Reactor Engineering (The University of Nagoya Press) in Japanese.
(Necessary materials will be distributed.)

●Grade Assessment

Presentation and/or oral examination
A score higher than 60/100 is required for the credit.
C: 60-69, B: 70-79, A: 80-89, S: 90-100.

●Notes

No requirements for registration.

●Contacting Faculty

Responded by mails or discussion (in person or online).

Applied Energy Seminar 2B (2.0credits) (総合エネルギー工学セミナー2B)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Department of Applied Energy		
Starts 1	1 Autumn Semester		
Lecturer	Youichi ENOKIDA Professor	Takahiko SUGIYAMA Associate Professor	Kayo SAWADA Associate Professor
	Akira KUWAHARA Assistant Professor		

●Course Purpose

This seminar aims at gaining an ability of formal written and oral presentations of study proposal and actual performing theoretical and experimental process analyses on the proposed study to master the essential ability as a master course student in the Department of Applied Energy.Additionally participants are required to cultivate fundamental knowledge on research safety and ethics, and should complete taking research notes in an adequate manner as a part of researcher's fundamentals.A student can expect obtaining ability of research planning, performing, and presentation of the results at an academic meeting or submission of a research paper.

●Prerequisite Subjects

1) Nuclear Fuel Cycle Engineering, 2) Process Systems Engineering for Energy Resources

●Course Topics

1. Literature survey on previous studies concerning to Energy Resources Recycling Engineering,2. Proposal and planning of a study on Energy Resources Recycling Engineering,3. Theoretical analysis on the proposed study,4. Experimental analysis on the proposed study,5. Oral presentation on the research results, and6. Technical writing on the research results.Before each class of the seminar, a student take this class should write on his or her research note summaries of results on literature survey, research activity, and discussion on the results, which are reported in the seminar.

●Textbook

1) M. Faraday, "Faraday's Diary of Experimental Investigation Vol.1-7," HI Direct (2008).2) According with the advancement of research plan, the other textbooks or research papers are to be suggested.

●Additional Reading

Y. Okazaki, 'How to write laboratory note,' Yodosya (2013)

●Grade Assessment

Oral presentation at each seminar(60%) and oral presentation at the academic meeting or paper submission(40%)A student pass the class by achieving the each content of the class. Extra outcomes such as presentation at the academic meeting or submitting a research paper is considered for additional points. Evaluation of grade will follow the standard provided by the Graduate School of Engineering. Obtaining 'A+ (S)' grade is granted for a student who has had an oral presentation at an international conference or authored an academic paper to be published in a periodical academic journal or equivalent during the semester.

●Notes

A student who take this class must have enough knowledge on laboratory safety,and hold an own laboratory notebook.

●Contacting Faculty

Please feel free to inquire on the lecture and problem solving by voice phone or e-mail in English or in Japanese, as follows;By phone; 052(789)5937 during office hours from 7:30 through 16:00,By e-mail; yenokida@nagoya-u.jp.

Applied Energy Seminar 2B (2.0credits) (総合エネルギー工学セミナー2B)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Department of Applied Energy		
Starts 1	1 Autumn Semester		
Lecturer	Akira URITANI Professor	Sachiko YOSHIHASHI Associate Professor	Atsushi YAMAZAKI Assistant Professor

●Course Purpose

You will read textbooks and papers necessary for the advancement of research using the interaction between neutrons and radiation and nuclei. You will present the contents.Through these learnings, you will be able to understand the details of neutron and radiation measurement methods and the application methods of their utilization techniques, and acquire the advanced ability to create.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Applied Energy Seminar 2B (2.0credits) (総合エネルギー工学セミナー2B)

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

●Course Purpose

By being given sub-themes which constitute the doctoral dissertation, students are requested to review literature and to carry out experimental and theoretical study in order to develop capability of finding and solving problems, controlling progress of study and tackling problems with original and innovative ideas

●Prerequisite Subjects

Radiation and Health Physics, Nuclear Environmental Safety, Radiation Measurements, Isotope Analysis

●Course Topics

The seminar includes reviewing of literatures relevant to the doctoral dissertation in the following fields and discussion on the plan and progress of doctoral study.:1. Radiation protection:2. Environmental radioactivity and radiation:3. Energy use-related environmental safety: 4. Environmental transfer of materials and environmental problems: 5. Radiation measurements and isotope analysis

●Textbook

A textbook and research articles will be designated at the beginning.

●Additional Reading

none

●Grade Assessment

Achievement will be evaluated by oral presentation and discussion in the seminar. Minimum mark for credit is 60/100.

●Notes

●Contacting Faculty

ext. 3781 yamazawa@nagoya-u.jp,
ext. 4695 tomita@nagoya-u.jp

Applied Energy Seminar 2B (2.0credits) (総合エネルギー工学セミナー2B)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Department of Applied Energy	
Starts 1	1 Autumn Semester	
Lecturer	"YAMAMOTO Akio" Professor	ENDO Tomohiro Associate Professor

●Course Purpose

The purpose of this course is to develop problem-finding and original problem-solving skills and to train convincing expressions through resolving original dissertations on doctoral dissertations.

The objectives of this lecture are as follows.
Discover problems to be solved in specific fields of nuclear energy control engineering.
Provide an original problem solving approach for the problem to be solved.
Can communicate research results accurately and easily.

●Prerequisite Subjects

Applied energy seminar 1A, 1B, 1C, 1D, Nuclear Safety

●Course Topics

1.Reactor design method
2.Sensitivity and uncertainty analysis
3.Optimization method
4.Nuclear safety
5.Criticality safety
6.Reactor noise diagnostics

Read relevant literature before the lecture and prepare for the lesson. After the lecture, review the contents of the lecture and check the examples again.

●Textbook

Introduce according to the content of the lecture.

●Additional Reading

Introduce according to the content of the lecture.

●Grade Assessment

Evaluate the level of achievement for the achievement target through reports and oral examinations during lectures. If you have a basic understanding of the content covered in this lecture, you will pass.

●Notes

According to Guidelines for Activities at Nagoya University During the Novel Coronavirus (COVID-19) Pandemic, face-to-face lectures may not be held.
In this case, the web lectures using "Zoom" instead of the face-to-face classes will be used.
The lecture's URL will be notified on NUCT (https://ct.nagoya-u.ac.jp/portal).

No registration requirements.

●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.

Contact: a-yamamoto[at]energy.(domain name of Nagoya University)

Applied Energy Seminar 2C (2.0credits) (総合エネルギー工学セミナー2C)

Course Type	Specialized Courses
Division at course	Doctor's Course
Class Format	Seminar
Course Name	Department of Applied Energy
Starts 1	2 Spring Semester
Lecturer	TakaakiFUJITA Professor Atsushi OKAMOTO Associate Professor

●Course Purpose

Lecturing in turn on textbooks or papers on plasma physics and nuclear fusion.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Applied Energy Seminar 2C (2.0credits) (総合エネルギー工学セミナー2C)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Department of Applied Energy	
Starts 1	2 Spring Semester	
Lecturer	Teruya TANAKA Associate Professor	Haruhisa NAKANO Associate Professor

●Course Purpose

In this seminar, understanding of status and issues in engineering studies for fusion power generation are conducted first, and then studying method and process for solving the issues, consideration on obtained data and conclusion of the study are reviewed and discussed. The seminar aims to obtain fundamental abilities to solve physical/engineering issues independently.

●Prerequisite Subjects

Electromagnetics, plasma engineering, mechanics, physical chemistry, related fundamental physics

●Course Topics

1) Components and materials required for fusion power generation and issues
2) Consideration of experimental and calculation methods to solve issues
3) Understanding and discussion on obtained experimental and calculated data
4) Conclusion extracted from obtained results
Preparation is required for assigned documents and issues to be investigated.

●Textbook

Information on textbooks and papers to be read will be provided.

●Additional Reading

1)F. F. Chen, "Introduction to Plasma Physics and Controlled Fusion", Third Edition, Springer 2016.
2)R. Goldston, H.P. Rutherford, "Introduction to Plasma Physics", IOP Publishing 1995.
3)Nuclear Fusion Research II - Fusion Reactor Engineering (The University of Nagoya Press) in Japanese.
(Necessary materials will be distributed.)

●Grade Assessment

Presentation and/or oral examination
A score higher than 60/100 is required for the credit.
C: 60-69, B: 70-79, A: 80-89, S: 90-100.

●Notes

No requirements for registration.

●Contacting Faculty

Responded by mails or discussion (in person or online).

Applied Energy Seminar 2C (2.0credits) (総合エネルギー工学セミナー2C)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Department of Applied Energy		
Starts 1	2 Spring Semester		
Lecturer	Youichi ENOKIDA Professor	Takahiko SUGIYAMA Associate Professor	Kayo SAWADA Associate Professor
	Akira KUWAHARA Assistant Professor		

●Course Purpose

This seminar aims at gaining an ability of formal written and oral presentations of study proposal and actual performing theoretical and experimental process analyses on the proposed study to master the essential ability as a master course student in the Department of Applied Energy.Additionally participants are required to cultivate fundamental knowledge on research safety and ethics, and should complete taking research notes in an adequate manner as a part of researcher's fundamentals.A student can expect obtaining ability of research planning, performing, and presentation of the results at an academic meeting or submission of a research paper.

●Prerequisite Subjects

1) Nuclear Fuel Cycle Engineering,
2) Process Systems Engineering for Energy Resources

●Course Topics

1. Literature survey on previous studies concerning to Energy Resources Recycling Engineering,
2. Proposal and planning of a study on Energy Resources Recycling Engineering,
3. Theoretical analysis on the proposed study,
4. Experimental analysis on the proposed study,
5. Oral presentation on the research results, and
6. Technical writing on the research results.

Before each class of the seminar, a student take this class should write on his or her research note summaries of results on literature survey, research activity, and discussion on the results, which are reported in the seminar.

●Textbook

1) M. Faraday, "Faraday's Diary of Experimental Investigation Vol.1-7," HI Direct (2008).
2) According with the advancement of research plan, the other textbooks or research papers are to be suggested.

●Additional Reading

Y. Okazaki, 'How to write laboratory note,' Yodosya (2013)

●Grade Assessment

Oral presentation at each seminar(60%) and oral presentation at the academic meeting or paper submission(40%)
A student pass the class by achieving the each content of the class. Extra outcomes such as presentation at the academic meeting or submitting a research paper is considered for additional points. Evaluation of grade will follow the standard provided by the Graduate School of Engineering. Obtaining 'A+ (S)' grade is granted for a student who has had an oral presentation at an international conference or authored an academic paper to be published in a periodical academic journal or equivalent during the semester.

●Notes

redits of Applied Energy Seminar 1A, 1B, 1C, 1D, 2A, 2B, or equivalents should have been earned. A student who take this class must have enough knowledge on laboratory safety,and hold an own laboratory notebook.

●Contacting Faculty

Please feel free to inquire on the lecture and problem solving by voice phone or e-mail in English or in Japanese, as follows;

By phone; 052(789)5937 during office hours from 7:30 through 16:00,
By e-mail; yenokida@nagoya-u.jp.

Applied Energy Seminar 2C (2.0credits) (総合エネルギー工学セミナー2C)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Department of Applied Energy		
Starts 1	2 Spring Semester		
Lecturer	Akira URITANI Professor	Sachiko YOSHIHASHI Associate Professor	Atsushi YAMAZAKI Assistant Professor

●Course Purpose

You will read textbooks and papers necessary for the advancement of research using the interaction between neutrons and radiation and nuclei. You will present the contents.Through these learnings, you will be able to understand the details of neutron and radiation measurement methods and the application methods of their utilization techniques, and acquire the advanced ability to create.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Applied Energy Seminar 2C (2.0credits) (総合エネルギー工学セミナー2C)

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

●Course Purpose

By being given sub-themes which constitute the doctoral dissertation, students are requested to review literature and to carry out experimental and theoretical study in order to develop capability of finding and solving problems, controlling progress of study and tackling problems with original and innovative ideas

●Prerequisite Subjects

Radiation and Health Physics, Nuclear Environmental Safety, Radiation Measurements, Isotope Analysis

●Course Topics

The seminar includes reviewing of literatures relevant to the doctoral dissertation in the following fields and discussion on the plan and progress of doctoral study.:1. Radiation protection:2. Environmental radioactivity and radiation:3. Energy use-related environmental safety: 4. Environmental transfer of materials and environmental problems: 5. Radiation measurements and isotope analysis

●Textbook

A textbook and research articles will be designated at the beginning.

●Additional Reading

none

●Grade Assessment

Achievement will be evaluated by oral presentation and discussion in the seminar. Minimum mark for credit is 60/100.

●Notes

●Contacting Faculty

ext. 3781 yamazawa@nagoya-u.jp,
ext. 4695 tomita@nagoya-u.jp

Applied Energy Seminar 2C (2.0credits) (総合エネルギー工学セミナー2C)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Department of Applied Energy	
Starts 1	2 Spring Semester	
Lecturer	"YAMAMOTO Akio" Professor	ENDO Tomohiro Associate Professor

●Course Purpose

The purpose of this course is to develop problem-finding and original problem-solving skills and to train convincing expressions through resolving original dissertations on doctoral dissertations.

The objectives of this lecture are as follows.
Discover problems to be solved in specific fields of nuclear energy control engineering.
Provide an original problem solving approach for the problem to be solved.
Can communicate research results accurately and easily.

●Prerequisite Subjects

Applied energy seminar 1A, 1B, 1C, 1D, Nuclear Safety

●Course Topics

1.Reactor design method
2.Sensitivity and uncertainty analysis
3.Optimization method
4.Nuclear safety
5.Criticality safety
6.Reactor noise diagnostics

Read relevant literature before the lecture and prepare for the lesson. After the lecture, review the contents of the lecture and check the examples again.

●Textbook

Introduce according to the content of the lecture.

●Additional Reading

Introduce according to the content of the lecture.

●Grade Assessment

Evaluate the level of achievement for the achievement target through reports and oral examinations during lectures. If you have a basic understanding of the content covered in this lecture, you will pass.

●Notes

According to Guidelines for Activities at Nagoya University During the Novel Coronavirus (COVID-19) Pandemic, face-to-face lectures may not be held.
In this case, the web lectures using "Zoom" instead of the face-to-face classes will be used.
The lecture's URL will be notified on NUCT (https://ct.nagoya-u.ac.jp/portal).

No registration requirements.

●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.

Contact: a-yamamoto[at]energy.(domain name of Nagoya University)

Applied Energy Seminar 2D (2.0credits) (総合エネルギー工学セミナー2D)

Course Type	Specialized Courses
Division at course	Doctor's Course
Class Format	Seminar
Course Name	Department of Applied Energy
Starts 1	2 Autumn Semester
Lecturer	TakaakiFUJITA Professor Atsushi OKAMOTO Associate Professor

●Course Purpose

Lecturing in turn on textbooks or papers on plasma physics and nuclear fusion.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Applied Energy Seminar 2D (2.0credits) (総合エネルギー工学セミナー2D)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Department of Applied Energy	
Starts 1	2 Autumn Semester	
Lecturer	Teruya TANAKA Associate Professor	Haruhisa NAKANO Associate Professor

●Course Purpose

In this seminar, understanding of status and issues in engineering studies for fusion power generation are conducted first, and then studying method and process for solving the issues, consideration on obtained data and conclusion of the study are reviewed and discussed. The seminar aims to obtain fundamental abilities to solve physical/engineering issues independently.

●Prerequisite Subjects

Electromagnetics, plasma engineering, mechanics, physical chemistry, related fundamental physics

●Course Topics

1) Components and materials required for fusion power generation and issues
2) Consideration of experimental and calculation methods to solve issues
3) Understanding and discussion on obtained experimental and calculated data
4) Conclusion extracted from obtained results
Preparation is required for assigned documents and issues to be investigated.

●Textbook

Information on textbooks and papers to be read will be provided.

●Additional Reading

1)F. F. Chen, "Introduction to Plasma Physics and Controlled Fusion", Third Edition, Springer 2016.
2)R. Goldston, H.P. Rutherford, "Introduction to Plasma Physics", IOP Publishing 1995.
3)Nuclear Fusion Research II - Fusion Reactor Engineering (The University of Nagoya Press) in Japanese.
(Necessary materials will be distributed.)

●Grade Assessment

Presentation and/or oral examination
A score higher than 60/100 is required for the credit.
C: 60-69, B: 70-79, A: 80-89, S: 90-100.

●Notes

No requirements for registration.

●Contacting Faculty

Responded by mails or discussion (in person or online).

Applied Energy Seminar 2D (2.0credits) (総合エネルギー工学セミナー2D)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Department of Applied Energy		
Starts 1	2 Autumn Semester		
Lecturer	Youichi ENOKIDA Professor	Takahiko SUGIYAMA Associate Professor	Kayo SAWADA Associate Professor
	Akira KUWAHARA Assistant Professor		

●Course Purpose

This seminar aims at gaining an ability of formal written and oral presentations of study proposal and actual performing theoretical and experimental process analyses on the proposed study to master the essential ability as a master course student in the Department of Applied Energy.Additionally participants are required to cultivate fundamental knowledge on research safety and ethics, and should complete taking research notes in an adequate manner as a part of researcher's fundamentals.A student can expect obtaining ability of research planning, performing, and presentation of the results at an academic meeting or submission of a research paper.

●Prerequisite Subjects

Nuclear Fuel Cycle Engineering:Purocess Engineering for Nuclear Materials

●Course Topics

1. Proposal of a study on process engineering of nuclear materials, 2. Theoretical analysis on the proposed study, 3. Experimental analysis on the proposed study, 4. Oral presentation on the research results, 5. Technical writing on the research results

●Textbook

None.

●Additional Reading

None.

●Grade Assessment

Oral presentation(50%) and reports(50%):
Evaluation of grade will follow the standard provided by the Graduate School of Engineering. Obtaining 'S' grade is granted for a student who has had an oral presentation at an international conference or authored an academic paper to be published in a periodical academic journal or equivalent during the semester.

●Notes

Credits of Applied Energy Seminar 1A, 1B, 1C, 1D, 2A, 2B, 2C or equivalents should have been earned. A student who take this class must have enough knowledge on laboratory safety,and hold an own laboratory notebook.

●Contacting Faculty

Please feel free to inquire on the lecture and problem solving by voice phone or e-mail in English or in Japanese, as follows;

By phone; 052(789)5937 during office hours from 7:30 through 16:00,
By e-mail; yenokida@nagoya-u.jp.

Applied Energy Seminar 2D (2.0credits) (総合エネルギー工学セミナー2D)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Department of Applied Energy		
Starts 1	2 Autumn Semester		
Lecturer	Akira URITANI Professor	Sachiko YOSHIHASHI Associate Professor	Atsushi YAMAZAKI Assistant Professor

●Course Purpose

You will read textbooks and papers necessary for the advancement of research using the interaction between neutrons and radiation and nuclei. You will present the contents.Through these learnings, you will be able to understand the details of neutron and radiation measurement methods and the application methods of their utilization techniques, and acquire the advanced ability to create.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Applied Energy Seminar 2D (2.0credits) (総合エネルギー工学セミナー2D)

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

●Course Purpose

By being given sub-themes which constitute the doctoral dissertation, students are requested to review literature and to carry out experimental and theoretical study in order to develop capability of finding and solving problems, controlling progress of study and tackling problems with original and innovative ideas

●Prerequisite Subjects

Radiation and Health Physics, Nuclear Environmental Safety, Radiation Measurements, Isotope Analysis

●Course Topics

The seminar includes reviewing of literatures relevant to the doctoral dissertation in the following fields and discussion on the plan and progress of doctoral study.:1. Radiation protection:2. Environmental radioactivity and radiation:3. Energy use-related environmental safety: 4. Environmental transfer of materials and environmental problems: 5. Radiation measurements and isotope analysis

●Textbook

A textbook and research articles will be designated at the beginning.

●Additional Reading

none

●Grade Assessment

Achievement will be evaluated by oral presentation and discussion in the seminar. Minimum mark for credit is 60/100.

●Notes

●Contacting Faculty

ext. 3781 yamazawa@nagoya-u.jp,
ext. 4695 tomita@nagoya-u.jp

Applied Energy Seminar 2D (2.0credits) (総合エネルギー工学セミナー2D)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Department of Applied Energy	
Starts 1	2 Autumn Semester	
Lecturer	"YAMAMOTO Akio" Professor	ENDO Tomohiro Associate Professor

●Course Purpose

The purpose of this course is to develop problem-finding and original problem-solving skills and to train convincing expressions through resolving original dissertations on doctoral dissertations.

The objectives of this lecture are as follows.
Discover problems to be solved in specific fields of nuclear energy control engineering.
Provide an original problem solving approach for the problem to be solved.
Can communicate research results accurately and easily.

●Prerequisite Subjects

Applied energy seminar 1A, 1B, 1C, 1D, Nuclear Safety

●Course Topics

1.Reactor design method
2.Sensitivity and uncertainty analysis
3.Optimization method
4.Nuclear safety
5.Criticality safety
6.Reactor noise diagnostics

Read relevant literature before the lecture and prepare for the lesson. After the lecture, review the contents of the lecture and check the examples again.

●Textbook

Introduce according to the content of the lecture.

●Additional Reading

Introduce according to the content of the lecture.

●Grade Assessment

Evaluate the level of achievement for the achievement target through reports and oral examinations during lectures. If you have a basic understanding of the content covered in this lecture, you will pass.

●Notes

According to Guidelines for Activities at Nagoya University During the Novel Coronavirus (COVID-19) Pandemic, face-to-face lectures may not be held.
In this case, the web lectures using "Zoom" instead of the face-to-face classes will be used.
The lecture's URL will be notified on NUCT (https://ct.nagoya-u.ac.jp/portal).

No registration requirements.

●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.

Contact: a-yamamoto[at]energy.(domain name of Nagoya University)

Applied Energy Seminar 2E (2.0credits) (総合エネルギー工学セミナー2E)

Course Type	Specialized Courses
Division at course	Doctor's Course
Class Format	Seminar
Course Name	Department of Applied Energy
Starts 1	3 Spring Semester
Lecturer	TakaakiFUJITA Professor Atsushi OKAMOTO Associate Professor

●Course Purpose

Lecturing in turn on textbooks or papers on plasma physics and nuclear fusion.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Applied Energy Seminar 2E (2.0credits) (総合エネルギー工学セミナー2E)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Department of Applied Energy	
Starts 1	3 Spring Semester	
Lecturer	Teruya TANAKA Associate Professor	Haruhisa NAKANO Associate Professor

●Course Purpose

In this seminar, understanding of status and issues in engineering studies for fusion power generation are conducted first, and then studying method and process for solving the issues, consideration on obtained data and conclusion of the study are reviewed and discussed. The seminar aims to obtain fundamental abilities to solve physical/engineering issues independently.

●Prerequisite Subjects

Electromagnetics, plasma engineering, mechanics, physical chemistry, related fundamental physics

●Course Topics

1) Components and materials required for fusion power generation and issues
2) Consideration of experimental and calculation methods to solve issues
3) Understanding and discussion on obtained experimental and calculated data
4) Conclusion extracted from obtained results
Preparation is required for assigned documents and issues to be investigated.

●Textbook

Information on textbooks and papers to be read will be provided.

●Additional Reading

1)F. F. Chen, "Introduction to Plasma Physics and Controlled Fusion", Third Edition, Springer 2016.
2)R. Goldston, H.P. Rutherford, "Introduction to Plasma Physics", IOP Publishing 1995.
3)Nuclear Fusion Research II - Fusion Reactor Engineering (The University of Nagoya Press) in Japanese.
(Necessary materials will be distributed.)

●Grade Assessment

Presentation and/or oral examination
A score higher than 60/100 is required for the credit.
C: 60-69, B: 70-79, A: 80-89, S: 90-100.

●Notes

No requirements for registration.

●Contacting Faculty

Responded by mails or discussion (in person or online).

Applied Energy Seminar 2E (2.0credits) (総合エネルギー工学セミナー2E)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Department of Applied Energy		
Starts 1	3 Spring Semester		
Lecturer	Youichi ENOKIDA Professor	Takahiko SUGIYAMA Associate Professor	Kayo SAWADA Associate Professor
	Akira KUWAHARA Assistant Professor		

●Course Purpose

This seminar aims at gaining an ability of formal written and oral presentations of study proposal and actual performing theoretical and experimental process analyses on the proposed study to master the essential ability as a master course student in the Department of Applied Energy.Additionally participants are required to cultivate fundamental knowledge on research safety and ethics, and should complete taking research notes in an adequate manner as a part of researcher's fundamentals.A student can expect obtaining ability of research planning, performing, and presentation of the results at an academic meeting or submission of a research paper.

●Prerequisite Subjects

Nuclear Fuel Cycle Engineering:Purocess Engineering for Nuclear Materials

●Course Topics

1. Proposal of a study on process engineering of nuclear materials, 2. Theoretical analysis on the proposed study, 3. Experimental analysis on the proposed study, 4. Oral presentation on the research results, 5. Technical writing on the research results

●Textbook

None.

●Additional Reading

M. Faraday, "Faraday's Diary of Experimental Investigation Vol.1-7," HI Direct (2008).

●Grade Assessment

Oral presentation(50%) and reports(50%):Evaluation of grade will follow the standard provided by the Graduate School of Engineering. Obtaining 'S' grade is granted for a student who has had an oral presentation at an international conference or authored an academic paper to be published in a periodical academic journal or equivalent during the semester.

●Notes

Credits of Applied Energy Seminar 1A, 1B, 1C, 1D, 2A, 2B, 2C, 2D or equivalents should have been earned. A student who take this class must have enough knowledge on laboratory safety,and hold an own laboratory notebook.

●Contacting Faculty

Please feel free to inquire on the lecture and problem solving by voice phone or e-mail in English or in Japanese, as follows;By phone; 052(789)5937 during office hours from 7:30 through 16:00,By e-mail; yenokida@nagoya-u.jp.

Applied Energy Seminar 2E (2.0credits) (総合エネルギー工学セミナー2E)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Department of Applied Energy		
Starts 1	3 Spring Semester		
Lecturer	Akira URITANI Professor	Sachiko YOSHIHASHI Associate Professor	Atsushi YAMAZAKI Assistant Professor

●Course Purpose

You will read textbooks and papers necessary for the advancement of research using the interaction between neutrons and radiation and nuclei. You will present the contents.Through these learnings, you will be able to understand the details of neutron and radiation measurement methods and the application methods of their utilization techniques, and acquire the advanced ability to create.

●Prerequisite Subjects

●Course Topics

●Textbook

●Additional Reading

●Grade Assessment

●Notes

●Contacting Faculty

Applied Energy Seminar 2E (2.0credits) (総合エネルギー工学セミナー2E)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Department of Applied Energy	
Starts 1	3 Spring Semester	
Lecturer	Hiromi YAMAZAWA Professor	Hideki TOMITA Associate Professor

●Course Purpose

By being given sub-themes which constitute the doctoral dissertation, students are requested to review literature and to carry out experimental and theoretical study in order to develop capability of finding and solving problems, controlling progress of study and tackling problems with original and innovative ideas

●Prerequisite Subjects

Radiation and Health Physics, Nuclear Environmental Safety, Radiation Measurements, Isotope Analysis

●Course Topics

The seminar includes reviewing of literatures relevant to the doctoral dissertation in the following fields and discussion on the plan and progress of doctoral study.:1. Radiation protection:2. Environmental radioactivity and radiation:3. Energy use-related environmental safety: 4. Environmental transfer of materials and environmental problems: 5. Radiation measurements and isotope analysis

●Textbook

A textbook and research articles will be designated at the beginning.

●Additional Reading

none

●Grade Assessment

Achievement will be evaluated by oral presentation and discussion in the seminar. Minimum mark for credit is 60/100.

●Notes

●Contacting Faculty

ext. 3781 yamazawa@nagoya-u.jp,
ext. 4695 tomita@nagoya-u.jp

Applied Energy Seminar 2E (2.0credits) (総合エネルギー工学セミナー2E)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Department of Applied Energy	
Starts 1	3 Spring Semester	
Lecturer	"YAMAMOTO Akio" Professor	ENDO Tomohiro Associate Professor

●Course Purpose

The purpose of this course is to develop problem-finding and original problem-solving skills and to train convincing expressions through resolving original dissertations on doctoral dissertations.

The objectives of this lecture are as follows.
Discover problems to be solved in specific fields of nuclear energy control engineering.
Provide an original problem solving approach for the problem to be solved.
Can communicate research results accurately and easily.

●Prerequisite Subjects

Applied energy seminar 1A, 1B, 1C, 1D, Nuclear Safety

●Course Topics

1.Reactor design method
2.Sensitivity and uncertainty analysis
3.Optimization method
4.Nuclear safety
5.Criticality safety
6.Reactor noise diagnostics

Read relevant literature before the lecture and prepare for the lesson. After the lecture, review the contents of the lecture and check the examples again.

●Textbook

Introduce according to the content of the lecture.

●Additional Reading

Introduce according to the content of the lecture.

●Grade Assessment

Evaluate the level of achievement for the achievement target through reports and oral examinations during lectures. If you have a basic understanding of the content covered in this lecture, you will pass.

●Notes

According to Guidelines for Activities at Nagoya University During the Novel Coronavirus (COVID-19) Pandemic, face-to-face lectures may not be held.
In this case, the web lectures using "Zoom" instead of the face-to-face classes will be used.
The lecture's URL will be notified on NUCT (https://ct.nagoya-u.ac.jp/portal).

No registration requirements.

●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.

Contact: a-yamamoto[at]energy.(domain name of Nagoya University)

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 device process system and device 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 electronic device process system and device 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 electronic device process system and device 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 understandinginonefieldfromelectronic device process and device 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.