

Fundamentals of Biomolecular Chemistry (2.0credits) (分子生命化学基礎論)

Course Type	Basic Courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
Starts 1	Spring Semester ,every other year	Spring Semester ,every other year	Spring Semester ,every other year
Lecturer	Yoshinobu BABA Professor HAYASHI Gosuke Associate Professor Yukiko KAMIYA Associate Professor	Takao YASUI Associate Professor Hiroyuki ASANUMA Professor	Hiroshi MURAKAMI Professor Hiromu KASHIDA Associate Professor

Course Purpose

This course aims to help students acquire an understanding of basic knowledge and application about nanobio analytical chemistry, chemical biotechnology, and supramolecular biochemistry. This course introduces methodology relating to measurements and evaluation of substances from various points of view.

Prerequisite Subjects

basic class of department of biomolecular engineering

Course Topics

1. Nanobio analytical chemistry
2. Chemical biotechnology
3. Supramolecular biochemistry

Textbook

no textbook, handouts as necessary

Additional Reading

Grade Assessment

Your overall grade in the class will be decided based on the following:

- Attendance: 30%
- Report: 70%

Notes

Contacting Faculty

You may contact the teacher after his/her lecture.
Otherwise you may contact us by email.

Fundamentals of Biosystem Engineering (2.0credits) (生命システム工学基礎論)

Course Type	Basic Courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
Starts 1	Spring Semester ,every other year	Spring Semester ,every other year	Spring Semester ,every other year
Lecturer	KIYONAKA Shigeki Professor Kazunori SHIMIZU Associate Professor	Hiroyuki HONDA Professor Atuo SUZUKI Associate Professor	Katsutoshi HORI Professor HajimeNAKATANI Lecturer

Course Purpose

The purpose of this course is to analyze recent topics in biotechnology fields from the basic and applied aspects and to discuss future developments from a biotechnological standpoint.

By learning this lecture, the goal is to be able to:

1. Learn and explain recent topics in basics and applications in the field of biotechnology.
2. Give an opinion on the future development of this field based on sufficient awareness of the current situation.

Prerequisite Subjects

Biochemistry with exercises 1-4, Biochemistry 5.

Fundamentals of Chemical Engineering.

Bioreaction Engineering.

Biological data science and engineering.

Course Topics

1. Drug development.
2. Food technology.
3. Hormones and signal transduction.
4. Cell cycle and tumor.
5. Developmental technology.
6. Biochemical engineering .

Textbook

Introduce in the class.

Additional Reading

Biochemistry, D. Voet & J. G. Voet, 4th Edition.

Biochemsiry, J.M. Berg, L. Stryer, J.L. Tymoczko & G.L. Gatto, 8th Edition.

Grade Assessment

This course is evaluated by presentation, report and discussion.

Notes

No requirements.

Contacting Faculty

We always accept your questions.

Fundamentals of Molecular and Macromolecular Chemistry (2.0credits) (有機・高分子化学基礎論)

Course Type	Basic Courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
Starts 1	1 Spring Semester	1 Spring Semester	1 Spring Semester
Lecturer	TakahiroSEKI Professor	Eiji YASHIMA Professor	MasamiKAMIGAITO Professor
	Kazuaki ISHIHARA Professor	Takashi OOI Professor	Hiroshi SHINOKUBO Professor
	MakotoYAMASHITA Professor	Atsushi TAKANO Associate Professor	Yukikazu Takeoka Associate Professor
	Daisuke URAGUCHI Associate Professor	Yoshihiro MIYAKE Associate Professor	Tomoyuki IKAI Associate Professor
	Kosuke OMATSU Designated Associate Professor	Junichi ITO Lecturer	Atsushi NORO Lecturer

Course Purpose

We study fundamental topics related to organic chemistry and macromolecular chemistry including organic material chemistry, organoelement Chemistry, organic reactions, catalysis in organic synthesis, physical chemistry of polymers, organic chemistry of macromolecules, macromolecular assembly systems, and supramolecular polymer chemistry. The purpose of this lecture is to understand fundamental topic in organic and macromolecular chemistry for learning advanced chemistry, and to gain applied, comprehensive, bird's-eye view skills.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Fundamentals of Physical Chemistry (2.0credits) (物理化学基礎論)

Course Type	Basic Courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
Starts 1	Spring Semester ,every other year	Spring Semester ,every other year	Spring Semester ,every other year
Lecturer	Atsushi Satsuma Professor ShinodaWataru Associate Professor Kyoichi SAWABE Lecturer	Tsukasa TORIMOTO Professor Shushi SUZUKI Associate Professor	Koichi KIKUTA Professor Jun KUMAGAI Associate Professor

Course Purpose

This lecture aims to be a researcher/engineer who can create and drive the next generation of "engineering and technology", and combines expertise as well as comprehensiveness with an international perspective. In the lectures, we will improve our basic knowledge in physical chemistry. The course is aimed to understand the principle and to attain the applicability of thermodynamics, chemical reaction kinetics, quantum chemistry, etc. which are necessary in various fields as the basis of Physical Chemistry.

Prerequisite Subjects

Thermodynamics, quantum chemistry, chemical kinetics, structural chemistry, electrochemistry, catalysis/surface chemistry, inorganic and physical chemistry exercises, photochemistry, radiation chemistry, polymer physical chemistry

Course Topics

This is an omnibus-style class including the following contents in the field of graduate-level physical chemistry related to thermodynamics, chemical reactions, and quantum mechanics.

1. Mechanism and surface of catalytic reaction, various catalysts
2. Industrial use of catalysts
3. Basics of statistical mechanics
4. Molecular Dynamics Method II
5. Quantum chemical calculations
6. Basics of Electrochemistry and Photoelectrochemistry
7. Design and application of nanomaterials
- 8 Light absorption and emission by organic molecules
- 9 Characteristics and mechanism of photochemical reaction
10. Photochemical reaction and material chemistry

Prepare for the next class and understand the meaning of technical terms.

Textbook

In case of necessity, printed handouts will be distributed in each lecture.

Additional Reading

Textbooks and papers are designated for each week.

Grade Assessment

Credits will be awarded to those students who score 60 or more based on the evaluation of academic achievements and attendance rate. The academic achievement is evaluated by examination, report, quiz or by their combination.

Notes

We should understand the lectures on physical chemistry in undergraduate course.

Contacting Faculty

Do not hesitate to ask any questions during the class, or to have an appointment with each lecturer by e-mail.

satsuma@chembio.nagoya-u.ac.jp(Satsuma)

torimoto@chembio.nagoya-u.ac.jp(Torimoto)

kik@chembio.nagoya-u.ac.jp(Kikuta)

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sawabe@chembio.nagoya-u.ac.jpSawabe

Fundamentals of Solide State Chemistry (2.0credits) (固体化学基礎論)

Course Type	Basic Courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
Starts 1	Spring Semester ,every other year	Spring Semester ,every other year	Spring Semester ,every other year
Lecturer	Ryoutarou MATSUDA Professor NAKANISHI Kazuki Professor Joji HASEGAWA Designated Associate Professor	Chikara OHTUKI Professor Ayae Narutaki Professor	OSADA Minoru Professor KOBAYASHI Makoto Associate Professor

Course Purpose

The purpose of this course is to understand important contents of solid-state chemistry including inorganic chemistry, coordination chemistry, structural chemistry, inorganic material chemistry, and crystallography, in order to acquire the ability to create new materials and substances that support a sustainable society.

In this course, the cutting-edge researchers will provide basic to the latest topics on energy-related materials, inorganic-organic hybrid materials, nanostructured materials, and biomaterials so that students will deepen understanding of these areas.

By the end of this course, students will be able to design new materials with a flexible idea, taking a bird's-eye view of the functions that solid materials manifest.

Prerequisite Subjects

Fundamental Chemistry I, Fundamental Chemistry II, Inorganic Chemistry 1 with Exercises, Inorganic Chemistry 2 with Exercises, Chemistry of Inorganic Reaction, and Inorganic Material Chemistry

Course Topics

Each faculty will give lectures in the omnibus style on solid-state chemistry, including inorganic chemistry, complex chemistry, structural chemistry, inorganic material chemistry, and crystallography. The topics include followings.

1. Energy-related (storage, conversion, etc.) materials
2. Inorganic-organic materials
3. Nanostructured materials
4. Nanoparticles
5. Biomaterials
6. Porous materials

Examinations or reports will be assigned after the classes.

References such as scientific papers will be provided in the classes for further reading.

Textbook

Textbooks are not designated. Prints are distributed when necessary.

Additional Reading

A. R. West: Solid State Chemistry, WILEY

Grade Assessment

Fundamentals of Solide State Chemistry (2.0credits) (固体化学基礎論)

Students should understand important contents of solid-state chemistry. The evaluation is performed by examinations and reports. Credits will be awarded to those students who score 60 or more.

Grades are as follows:

<Enrollees after 2020>

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

<Enrollees before 2019>

S: 100-90, A: 89-80, B: 79-70, C: 69-60, F: 59-0.

Notes

It is desirable for students to have basic knowledge of Fundamental Chemistry I, Fundamental Chemistry II, Inorganic Chemistry 1 with Exercises, Inorganic Chemistry 2 with Exercises, Chemistry of Inorganic Reaction, and Inorganic Material Chemistry.

Contacting Faculty

Questions outside the hours are accepted in the lecture room or teachers' room after the class. Otherwise, contact the professors by e-mail in advance.

Prof. Ryotaro Matsuda (ryotaro.matsuda@chembio.nagoya-u.ac.jp)

Prof. Chikara Ohtsuki (ohtsuki@chembio.nagoya-u.ac.jp)

Prof. Minoru Osada (mosada@imass.nagoya-u.ac.jp)

Prof. Kazuki Nakanishi (dknakanishi@imass.nagoya-u.ac.jp)

Assoc. Prof. Ayae Sugawara-Narutaki (ayae@chembio.nagoya-u.ac.jp)

Assoc. Prof. Makoto Kobayashi (mkoba@imass.nagoya-u.ac.jp)

Assoc. Prof. George Hasegawa (h-george@imass.nagoya-u.ac.jp)

Seminar on Biomolecular Chemistry 1A (2.0credits) (分子生命化学セミナー 1A)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Biomolecular Engineering	
Starts 1	1 Spring Semester	
Lecturer	Yoshinobu BABA Professor	Takao YASUI Associate Professor

Course Purpose

The aim of this course is to gain an understanding of nanobio-, bioanalytical-, and analytical-related research topics as well as a research plan-do-check-act (PDCA) cycles via learning nanobio-, bioanalytical-, and analytical-related research articles.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Seminar on Biomolecular Chemistry 1A (2.0credits) (分子生命化学セミナー 1A)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Biomolecular Engineering		
Starts 1	1 Spring Semester		
Lecturer	Hiroshi MURAKAMI Professor	HAYASHI Gosuke Associate Professor	FUJINO Tomoshige Assistant Professor

Course Purpose

The purpose of this class is to gain an understanding of analytical and synthetic methods for biomolecules by reading advanced textbooks and research reports published in scientific journals.

Prerequisite Subjects

Analytical Chemistry, Organic Chemistry, Biochemistry, and Molecular Biology

Course Topics

1. Reading and explaining advanced textbooks
2. Reviewing research articles
3. Research proposals

Textbook

Additional Reading

Text books will be announced in the beginning of the course.

Grade Assessment

Your overall grade in the class will be decided based on the following:- Oral presentation: 60%- Q&A session: 40%

Notes

Contacting Faculty

You may contact me after a lecture. Otherwise you may contact us by phone or email. Prof. Murakami (Phone: 052-789-3327; Email: murah@chembio.nagoya-u.ac.jp) Prof. Hayashi (Phone: 052-789-3302; Email: hayashi@chembio.nagoya-u.ac.jp)

Seminar on Biomolecular Chemistry 1A (2.0credits) (分子生命化学セミナー 1A)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Biomolecular Engineering		
Starts 1	1 Spring Semester		
Lecturer	Hiroyuki ASANUMA Professor	Hiromu KASHIDA Associate Professor	Yukiko KAMIYA Associate Professor
	Keiji MURAYAMA Assistant Professor		

Course Purpose

This course is intend to gain understanding of basic concepts and recent topics of biopolymers and biomaterials including, synthetic method, structure, properties, and functions through presentation and discussion in seminar. Students will be given opportunities to prepare presentations, introduce research papers in journal club, and present research progress.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Seminar on Biomolecular Chemistry 1B (2.0credits) (分子生命化学セミナー 1B)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Biomolecular Engineering	
Starts 1	1 Autumn Semester	
Lecturer	Yoshinobu BABA Professor	Takao YASUI Associate Professor

Course Purpose

The aim of this course is to gain an understanding of nanobio-, bioanalytical-, and analytical-related research topics as well as a research plan-do-check-act (PDCA) cycles via learning nanobio-, bioanalytical-, and analytical-related research articles.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Seminar on Biomolecular Chemistry 1B (2.0credits) (分子生命化学セミナー 1B)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Biomolecular Engineering		
Starts 1	1 Autumn Semester		
Lecturer	Hiroshi MURAKAMI Professor	HAYASHI Gosuke Associate Professor	FUJINO Tomoshige Assistant Professor

Course Purpose

The purpose of this class is to gain an understanding of analytical and synthetic methods for biomolecules by reading advanced textbooks and research reports published in scientific journals.

Prerequisite Subjects

Analytical Chemistry, Organic Chemistry, Biochemistry, and Molecular Biology

Course Topics

1. Reading and explaining advanced textbooks
2. Reviewing research articles
3. Research proposals

Textbook

Additional Reading

Text books will be announced in the beginning of the course.

Grade Assessment

Your overall grade in the class will be decided based on the following:- Oral presentation: 60%- Q&A session: 40%

Notes

Contacting Faculty

You may contact me after a lecture. Otherwise you may contact us by phone or email. Prof. Murakami (Phone: 052-789-3327; Email: murah@chembio.nagoya-u.ac.jp) Prof. Hayashi (Phone: 052-789-3302; Email: hayashi@chembio.nagoya-u.ac.jp)

Seminar on Biomolecular Chemistry 1B (2.0credits) (分子生命化学セミナー 1B)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Biomolecular Engineering		
Starts 1	1 Autumn Semester		
Lecturer	Hiroyuki ASANUMA Professor	Hiromu KASHIDA Associate Professor	Yukiko KAMIYA Associate Professor
	Keiji MURAYAMA Assistant Professor		

Course Purpose

This course is intend to gain understanding of basic concepts and recent topics of biopolymers and biomaterials including, synthetic method, structure, properties, and functions through presentation and discussion in seminar. Students will be given opportunities to prepare presentations, introduce research papers in journal club, and present research progress.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Seminar on Biomolecular Chemistry 1C (2.0credits) (分子生命化学セミナー 1C)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Biomolecular Engineering	
Starts 1	2 Spring Semester	
Lecturer	Yoshinobu BABA Professor	Takao YASUI Associate Professor

Course Purpose

The aim of this course is to gain an understanding of nanobio-, bioanalytical-, and analytical-related research topics as well as a research plan-do-check-act (PDCA) cycles via learning nanobio-, bioanalytical-, and analytical-related research articles.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Seminar on Biomolecular Chemistry 1C (2.0credits) (分子生命化学セミナー 1C)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Biomolecular Engineering		
Starts 1	2 Spring Semester		
Lecturer	Hiroshi MURAKAMI Professor	HAYASHI Gosuke Associate Professor	FUJINO Tomoshige Assistant Professor

Course Purpose

The purpose of this class is to gain an understanding of analytical and synthetic methods for biomolecules by reading advanced textbooks and research reports published in scientific journals.

Prerequisite Subjects

Analytical Chemistry, Organic Chemistry, Biochemistry, and Molecular Biology

Course Topics

1. Reading and explaining advanced textbooks
2. Reviewing research articles
3. Research proposals

Textbook

N/A

Additional Reading

Text books will be announced in the beginning of the course.

Grade Assessment

Your overall grade in the class will be decided based on the following:- Oral presentation: 60%- Q&A session: 40%

Notes

Contacting Faculty

You may contact me after a lecture. Otherwise you may contact us by phone or email. Prof. Murakami (Phone: 052-789-3327; Email: murah@chembio.nagoya-u.ac.jp) Prof. Hayashi (Phone: 052-789-3302; Email: hayashi@chembio.nagoya-u.ac.jp)

Seminar on Biomolecular Chemistry 1C (2.0credits) (分子生命化学セミナー 1C)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Biomolecular Engineering		
Starts 1	2 Spring Semester		
Lecturer	Hiroyuki ASANUMA Professor	Hiromu KASHIDA Associate Professor	Yukiko KAMIYA Associate Professor
	Keiji MURAYAMA Assistant Professor		

Course Purpose

This course is intend to gain understanding of basic concepts and recent topics of biopolymers and biomaterials including, synthetic method, structure, properties, and functions through presentation and discussion in seminar. Students will be given opportunities to prepare presentations, introduce research papers in journal club, and present research progress.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Seminar on Biomolecular Chemistry 1D (2.0credits) (分子生命化学セミナー 1D)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Biomolecular Engineering	
Starts 1	2 Autumn Semester	
Lecturer	Yoshinobu BABA Professor	Takao YASUI Associate Professor

Course Purpose

The aim of this course is to gain an understanding of nanobio-, bioanalytical-, and analytical-related research topics as well as a research plan-do-check-act (PDCA) cycles via learning nanobio-, bioanalytical-, and analytical-related research articles.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Seminar on Biomolecular Chemistry 1D (2.0credits) (分子生命化学セミナー 1D)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Biomolecular Engineering		
Starts 1	2 Autumn Semester		
Lecturer	Hiroshi MURAKAMI Professor	HAYASHI Gosuke Associate Professor	FUJINO Tomoshige Assistant Professor

Course Purpose

The purpose of this class is to gain an understanding of analytical and synthetic methods for biomolecules by reading advanced textbooks and research reports published in scientific journals.

Prerequisite Subjects

Analytical Chemistry, Organic Chemistry, Biochemistry, and Molecular Biology

Course Topics

1. Reading and explaining advanced textbooks
2. Reviewing research articles
3. Research proposals

Textbook

Additional Reading

Text books will be announced in the beginning of the course.

Grade Assessment

Your overall grade in the class will be decided based on the following:- Oral presentation: 60%- Q&A session: 40%

Notes

Contacting Faculty

You may contact me after a lecture. Otherwise you may contact us by phone or email. Prof. Murakami (Phone: 052-789-3327; Email: murah@chembio.nagoya-u.ac.jp) Prof. Hayashi (Phone: 052-789-3302; Email: hayashi@chembio.nagoya-u.ac.jp)

Seminar on Biomolecular Chemistry 1D (2.0credits) (分子生命化学セミナー 1D)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Biomolecular Engineering		
Starts 1	2 Autumn Semester		
Lecturer	Hiroyuki ASANUMA Professor	Hiromu KASHIDA Associate Professor	Yukiko KAMIYA Associate Professor
	Keiji MURAYAMA Assistant Professor		

Course Purpose

This course is intend to gain understanding of basic concepts and recent topics of biopolymers and biomaterials including, synthetic method, structure, properties, and functions through presentation and discussion in seminar. Students will be given opportunities to prepare presentations, introduce research papers in journal club, and present research progress.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Seminar on Biosystem Engineering 1A (2.0credits) (生命システム工学セミナー 1A)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Biomolecular Engineering	
Starts 1	1 Spring Semester	
Lecturer	KIYONAKA Shigeki Professor	Hidenori KANEOKA Assistant Professor

Course Purpose

The purpose of this seminar is to acquire basic knowledge in the field of chemical genetics.

The goal by learning this class is to obtain the following ability.

1. To survey and select superior paper that leads to new concept or technology.
2. To summarize and present recent trends of the research.
3. To propose the direction of the research project.
4. To present and discuss research progress of own project.

Review literature and collect data according to weekly guidance.

Prerequisite Subjects

Biochemistry 1-5

Course Topics

1. Journal club. 2. Research progress report. The course is proceeded with free discussion in the form of seminar.

Textbook

Introduce in the class.

Additional Reading

Introduce in the class.

Grade Assessment

Grade will be decided based on the following: presentation, oral examination.

Notes

No requirements.

Contacting Faculty

contact: kiyonaka@chembio.nagoya-u.ac.jp Phone 052-789-4275

Seminar on Biosystem Engineering 1A (2.0credits) (生命システム工学セミナー 1A)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Biomolecular Engineering	
Starts 1	1 Spring Semester	
Lecturer	Hiroyuki HONDA Professor	Kazunori SHIMIZU Associate Professor

Course Purpose

The purpose of this course is to introduce and analyze recent academic papers in biotechnology fields from the basic and applied aspects and to discuss future developments from a biotechnological standpoint. By learning this lecture, the goal is to be able to: 1. Select recent academic papers in basics and applications in the field of biotechnology. 2. Understand and explain the contents of them. 3. Propose future works relating to the papers introduced. 4. Explain the individual progress report and give an opinion on the future development.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Seminar on Biosystem Engineering 1A (2.0credits) (生命システム工学セミナー 1A)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Biomolecular Engineering		
Starts 1	1 Spring Semester		
Lecturer	Katsutoshi HORI Professor	Atuo SUZUKI Associate Professor	HajimeNAKATANI Lecturer
	Masahito ISHIKAWA Assistant Professor		

Course Purpose

Students learn how to refer and read articles to obtain information on research. Students introduce the contents of the articles and respond to questions. Students present background of their research themes and report their progress. Goal 1. Students can obtain important references. 2. Students can understand the contents of the articles and explain them to others. 3. Students can explain results of their research to others. 4. Students acquire skill for presentation. 5. Students properly answer to questions at presentation.

Prerequisite Subjects

Lectures in the Department of Biotechnology

Course Topics

1. Article introduction 2. Presentation about progress in research You will introduce recent academic papers and report on your research progress in order, so be sure to prepare for your presentation before your turn.

Textbook

We introduce articles or textbooks as appropriate as the seminar progresses.

Additional Reading

"Seikagakujiten" Tokyo Kagakudojin Textbooks used in undergraduate students

Grade Assessment

Achievement score is evaluated by effort for preparation (20%), presentation (30%), response to questions (30%), and results of homework (20%).

Notes

No course requirements.

Contacting Faculty

Ask anything at any working time.

Seminar on Biosystem Engineering 1B (2.0credits) (生命システム工学セミナー 1B)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Biomolecular Engineering	
Starts 1	1 Autumn Semester	
Lecturer	KIYONAKA Shigeki Professor	Hidenori KANEOKA Assistant Professor

Course Purpose

The purpose of this seminar is to acquire basic knowledge in the field of chemical genetics.

The goal by learning this class is to obtain the following ability.

1. To survey and select superior paper that leads to new concept or technology.
2. To summarize and present recent trends of the research.
3. To propose the direction of the research project.
4. To present and discuss research progress of own project.

Review literature and collect data according to weekly guidance.

Prerequisite Subjects

Biochemistry 1-5

Course Topics

1. Journal club. 2. Research progress report. The course is proceeded with free discussion in the form of seminar.

Textbook

Introduce in the class.

Additional Reading

Introduce in the class.

Grade Assessment

Grade will be decided based on the following: presentation and oral examination.

Notes

No requirements.

Contacting Faculty

contact: kiyonaka@chembio.nagoya-u.ac.jp Phone 052-789-4275

Seminar on Biosystem Engineering 1B (2.0credits) (生命システム工学セミナー 1B)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Biomolecular Engineering	
Starts 1	1 Autumn Semester	
Lecturer	Hiroyuki HONDA Professor	Kazunori SHIMIZU Associate Professor

Course Purpose

The purpose of this course is to introduce and analyze recent academic papers in biotechnology fields from the basic and applied aspects and to discuss future developments from a biotechnological standpoint. By learning this lecture, the goal is to be able to: 1. Select recent academic papers in basics and applications in the field of biotechnology. 2. Understand and explain the contents of them. 3. Propose future works relating to the papers introduced. 4. Explain the individual progress report and give an opinion on the future development.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Seminar on Biosystem Engineering 1B (2.0credits) (生命システム工学セミナー 1B)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Biomolecular Engineering		
Starts 1	1 Autumn Semester		
Lecturer	Katsutoshi HORI Professor	Atuo SUZUKI Associate Professor	HajimeNAKATANI Lecturer
	Masahito ISHIKAWA Assistant Professor		

Course Purpose

Students learn how to refer and read articles to obtain information on research. Students introduce the contents of the articles and respond to questions. Students present background of their research themes and report their progress. Goal 1. Students can obtain important references. 2. Students can understand the contents of the articles and explain them to others. 3. Students can explain results of their research to others. 4. Students acquire skill for presentation. 5. Students properly answer to questions at presentation.

Prerequisite Subjects

Seminar on Biosystem Engineering 1A

Course Topics

1. Article introduction 2. Presentation about progress in research You will introduce recent academic papers and report on your research progress in order, so be sure to prepare for your presentation before your turn.

Textbook

We introduce articles or textbooks as appropriate as the seminar progresses.

Additional Reading

"Seikagakujiten" Tokyo Kagakudojin

Grade Assessment

Achievement score is evaluated by effort for preparation (20%), presentation (30%), response to questions (30%), and results of homework (20%).

Notes

No course requirements.

Contacting Faculty

Ask anything at any working time.

Seminar on Biosystem Engineering 1C (2.0credits) (生命システム工学セミナー 1C)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Biomolecular Engineering	
Starts 1	2 Spring Semester	
Lecturer	KIYONAKA Shigeki Professor	Hidenori KANEOKA Assistant Professor

Course Purpose

The purpose of this seminar is to acquire basic knowledge in the field of chemical genetics.

The goal by learning this class is to obtain the following ability.

1. To survey and select superior paper that leads to new concept or technology.
2. To summarize and present recent trends of the research.
3. To propose the direction of the research project.
4. To present and discuss research progress of own project.

Review literature and collect data according to weekly guidance.

Prerequisite Subjects

Biochemistry 1-5

Course Topics

1. Journal club. 2. Research progress report. The course is proceeded with free discussion in the form of seminar.

Textbook

Introduce in the class.

Additional Reading

Introduce in the class.

Grade Assessment

Grade will be decided based on the following: presentation and oral examination.

Notes

No requirements.

Contacting Faculty

contact: kiyonaka@chembio.nagoya-u.ac.jp Phone 052-789-4275

Seminar on Biosystem Engineering 1C (2.0credits) (生命システム工学セミナー 1C)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Biomolecular Engineering	
Starts 1	2 Spring Semester	
Lecturer	Hiroyuki HONDA Professor	Kazunori SHIMIZU Associate Professor

Course Purpose

The purpose of this course is to introduce and analyze recent academic papers in biotechnology fields from the basic and applied aspects and to discuss future developments from a biotechnological standpoint. By learning this lecture, the goal is to be able to: 1. Select recent academic papers in basics and applications in the field of biotechnology. 2. Understand and explain the contents of them. 3. Propose future works relating to the papers introduced. 4. Explain the individual progress report and give an opinion on the future development.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Seminar on Biosystem Engineering 1C (2.0credits) (生命システム工学セミナー 1C)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Biomolecular Engineering		
Starts 1	2 Spring Semester		
Lecturer	Katsutoshi HORI Professor	Atuo SUZUKI Associate Professor	HajimeNAKATANI Lecturer
	Masahito ISHIKAWA Assistant Professor		

Course Purpose

Students learn how to refer and read articles to obtain information on research. Students introduce the contents of the articles and respond to questions. Students present background of their research themes and report their progress. Goal 1. Students can obtain important references. 2. Students can understand the contents of the articles and explain them to others. 3. Students can explain results of their research to others. 4. Students acquire skill for presentation. 5. Students properly answer to questions at presentation.

Prerequisite Subjects

Seminar on Biosystem Engineering (1A, 1B)

Course Topics

1. Article introduction 2. Presentation about progress in research You will introduce recent academic papers and report on your research progress in order, so be sure to prepare for your presentation before your turn.

Textbook

We introduce articles or textbooks as appropriate as the seminar progresses.

Additional Reading

"Seikagakujiten" Tokyo Kagakudojin

Grade Assessment

Achievement score is evaluated by effort for preparation (20%), presentation (30%), response to questions (30%), and results of homework (20%).

Notes

No course requirements.

Contacting Faculty

Ask anything at any working time.

Seminar on Biosystem Engineering 1D (2.0credits) (生命システム工学セミナー 1D)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Biomolecular Engineering	
Starts 1	2 Autumn Semester	
Lecturer	KIYONAKA Shigeki Professor	Hidenori KANEOKA Assistant Professor

Course Purpose

The purpose of this seminar is to acquire basic knowledge in the field of chemical genetics.

The goal by learning this class is to obtain the following ability.

1. To survey and select superior paper that leads to new concept or technology.
2. To summarize and present recent trends of the research.
3. To propose the direction of the research project.
4. To present and discuss research progress of own project.

Review literature and collect data according to weekly guidance.

Prerequisite Subjects

Biochemistry 1-5

Course Topics

1. Journal club. 2. Research progress report. The course is proceeded with free discussion in the form of seminar.

Textbook

Introduce in the class.

Additional Reading

Introduce in the class.

Grade Assessment

Grade will be decided based on the following: presentation and oral examination.

Notes

No requirements.

Contacting Faculty

contact: kiyonaka@chembio.nagoya-u.ac.jp Phone 052-789-4275

Seminar on Biosystem Engineering 1D (2.0credits) (生命システム工学セミナー 1D)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Biomolecular Engineering	
Starts 1	2 Autumn Semester	
Lecturer	Hiroyuki HONDA Professor	Kazunori SHIMIZU Associate Professor

Course Purpose

The purpose of this course is to introduce and analyze recent academic papers in biotechnology fields from the basic and applied aspects and to discuss future developments from a biotechnological standpoint. By learning this lecture, the goal is to be able to: 1. Select recent academic papers in basics and applications in the field of biotechnology. 2. Understand and explain the contents of them. 3. Propose future works relating to the papers introduced. 4. Explain the individual progress report and give an opinion on the future development.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Seminar on Biosystem Engineering 1D (2.0credits) (生命システム工学セミナー 1D)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Biomolecular Engineering		
Starts 1	2 Autumn Semester		
Lecturer	Katsutoshi HORI Professor	Atuo SUZUKI Associate Professor	HajimeNAKATANI Lecturer
	Masahito ISHIKAWA Assistant Professor		

Course Purpose

Students learn how to refer and read articles to obtain information on research. Students introduce the contents of the articles and respond to questions. Students present background of their research themes and report their progress. Goal 1. Students can obtain important references. 2. Students can understand the contents of the articles and explain them to others. 3. Students can explain results of their research to others. 4. Students acquire skill for presentation. 5. Students properly answer to questions at presentation.

Prerequisite Subjects

Seminar on Biosystem Engineering (1A, 1B, 1C)

Course Topics

1. Article introduction 2. Presentation about progress in research You will introduce recent academic papers and report on your research progress in order, so be sure to prepare for your presentation before your turn.

Textbook

We introduce articles or textbooks as appropriate as the seminar progresses.

Additional Reading

"Seikagakujiten" Tokyo Kagakudojin

Grade Assessment

Achievement score is evaluated by effort for preparation (20%), presentation (30%), response to questions (30%), and results of homework (20%).

Notes

No course requirements.

Contacting Faculty

Ask anything at any working time.

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	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

Nothing particularly needed

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	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

Nothing particularly needed

Contacting Faculty

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

Nanobio Analytical Chemistry (2.0credits) (ナノバイオ計測化学)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Biomolecular Engineering	
Starts 1	Spring Semester ,every other year	
Lecturer	Yoshinobu BABA Professor	Takao YASUI Associate Professor

Course Purpose

The aim of this course is to gain an understanding of nanobio-, bioanalytical-, and analytical-related methods, and state-of-the-art analytical methods.

1. Explain principles and applications for each spectroscopic and chromatographic methods.
2. Explain state-of-the-art analytical methods.
3. Propose analytical methods based on the above mentioned methods.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Chemical Biotechnology (2.0credits) (生体分子応用化学)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Biomolecular Engineering	
Starts 1	Autumn Semester ,every other year	
Lecturer	Hiroshi MURAKAMI Professor	HAYASHI Gosuke Associate Professor

Course Purpose

This course introduces students to advanced biochemical techniques:ex. RNA engineering, protein engineering, directed evolution, synthetic biology, nucleic acids chemistry, peptide chemistry, protein chemistry, and epigenetics.

Prerequisite Subjects

Analytical Chemistry, Organic Chemistry, Biochemistry, and Molecular Biology

Course Topics

1. Nucleic acid chemistry You will learn in vitro selection of DNA/RNA aptamers, synthetic nucleic acid chemistry, detection and imaging of modified DNA/RNA, DNA epigenetics. 2. Protein chemistry You will learn in vitro selection of proteins, genetic code engineering, synthetic biology, synthetic peptide/protein chemistry, detection of protein modification, and epigenetics.

Textbook

Additional Reading

Molecular Biology of the Gene, James D. Watson, Tania A. Baker, Stephen P. Bell, Alexander Gann, Michael Levine, Richard Losick ISBN-10: 080539592X ISBN-13: 978-0805395921

Grade Assessment

Your final grade will be calculated according to the following process: Usual performance score 50%, Reports 50%.

Notes

Contacting Faculty

You may contact me after a lecture. Otherwise you may contact us by phone or email. Prof. Murakami (Phone: 052-789-3327; Email: murah@chembio.nagoya-u.ac.jp) Prof. Hayashi (Phone: 052-789-3302; Email: hayashi@chembio.nagoya-u.ac.jp)

Supramolecular Biochemistry (2.0credits) (生命超分子化学)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Biomolecular Engineering		
Starts 1	Spring Semester ,every other year		
Lecturer	Hiroyuki ASANUMA Professor	Hiromu KASHIDA Associate Professor	Yukiko KAMIYA Associate Professor

Course Purpose

Students will study properties and functions of oligonucleotides from the view points of photochemistry and supramolecular chemistry. Lectures are especially focused on the photochemical properties of oligonucleotides as molecular assemblies.

Prerequisite Subjects

Quantum Chemistry 1 with Exercises

Biochemistry 1 with Exercises

Course Topics

1. Basic chemistry of nucleic acids and structure of DNA duplex
2. Quantum chemical interpretation of photo-excitation
3. Photochemical property of assemble molecules based on the molecular exciton theory
4. Relationship between CD and higher-ordered structure of DNA duplex
5. FRET theory and photoresponsive DNA
6. Fluorescent probe
7. Artificial nucleic acid
8. Antisense and RNAi
9. Self-assembly of DNA
10. New evolution of functional nucleic acids

Textbook

Additional Reading

Biomaterial Chemistry-Fundamentals and Applications-

Grade Assessment

Notes

Contacting Faculty

Genetic Engineering and Molecular Biology (2.0credits) (遺伝子工学)

Course Type	Specialized Courses
Division at course	Master's Course
Class Format	Lecture
Course Name	Biomolecular Engineering
Starts 1	Autumn Semester ,every other year
Lecturer	KIYONAKA Shigeki Professor

Course Purpose

This course introduces current topics about new research fields such as animal cell technology, genetic engineering, chemical genetics and chemical biology. Participants are expected to make a presentation in these topics.

Prerequisite Subjects

Biochemistry1-5

Course Topics

1. Animal cell technology
2. Genetic engineering
3. Chemical genetics
4. Chemical Biology

Textbook

Introduce in the class.

Additional Reading

Biochemistry, D. Voet & J. G. Voet, 4th Edition.

Biochemsiry, J.M. Berg, L. Stryer, J.L. Tymoczko & G.L. Gatto, 8th Edition.

Grade Assessment

This course is evaluated by presentation, debate and report.

Notes

No requirements.

Contacting Faculty

We always accept your questions.

Biochemical Engineering (2.0credits) (生物化学工学)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Biomolecular Engineering	
Starts 1	Spring Semester ,every other year	
Lecturer	Hiroyuki HONDA Professor	Kazunori SHIMIZU Associate Professor

Course Purpose

Students learn the recent progress in the biotechnological field, particularly the biochemistry engineering field and bring an element of the necessary originality and the engineering sense as an engineer and a researcher. Especially, they aim for coming to be able to do the following things by learning this lecture.1) to understand the recent trend in the biochemical engineering field and can explain them.2) to learn the knowledge of the field concerned and can explain them

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Molecular and Bio-environmental Process (2.0credits) (分子生命環境プロセス)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Biomolecular Engineering		
Starts 1	Autumn Semester ,every other year		
Lecturer	Katsutoshi HORI Professor	Atuo SUZUKI Associate Professor	HajimeNAKATANI Lecturer

Course Purpose

Students learn methodology for applying microbial functions to removal and degradation of contaminants from waste, bioremediation, production and recovery of resources and energies, and green chemical production. Through the class, students improve abilities for investigation, presentation and discussion.

Prerequisite Subjects

Biochemistry, Microbiology, Bioprocess, Biotechnology

Course Topics

1. What are environmental microbes (EM)? 2. Functions and characteristics of EM 3. Analyses of EM 4. Evolution of EM and ecosystem formation 5. Chemical transformation by EM 6. Extremophile 7. Drastic change of earth environment and its relation to EM 8. Microbial degradation of toxic chemicals 9. Bioremediation I 10. Bioremediation II 11. Environmental monitoring and microbes 12. Application of microbe to food production I 13. Application of microbe to food production II 14. Biofuels I 15. Biofuels II

Textbook

Additional Reading

As needed

Grade Assessment

Submission of Report about environmental microbiology and applied microbiology.

Notes

Contacting Faculty

Advanced Biomolecular Engineering I (1.0credits) (生命分子工学特論)

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

Course Purpose

This course is intended to study the latest topics in various field of biomolecular engineering including molecular biochemistry and biosystems.

Top researchers are invited as lecturers to present their recent topics.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Advanced Biomolecular Engineering II (1.0credits) (生命分子工学特論)

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

Course Purpose

This course is intended to study the latest topics in various field of biomolecular engineering including molecular biochemistry and biosystems.

Top researchers are invited as lecturers to present their recent topics.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Experiment and Exercise	
Course Name	Biomolecular Engineering	
Starts 1	1 Spring Semester	
Lecturer	Yoshinobu BABA Professor	Takao YASUI Associate Professor

Course Purpose

The aim of this course is to gain an understanding of nanobio-, bioanalytical-, and analytical-related research topics as well as data analysis and theoretical interpretation via learning nanobio-, bioanalytical-, and analytical-related research articles.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Experiment and Exercise	
Course Name	Biomolecular Engineering	
Starts 1	1 Spring Semester	
Lecturer	Hiroshi MURAKAMI Professor	HAYASHI Gosuke Associate Professor

Course Purpose

The purpose of this class is to master various analytical and synthetic methods for biomolecules.

Prerequisite Subjects

Analytical Chemistry, Organic Chemistry, Physical Chemistry, Biochemistry, and Molecular Biology

Course Topics

1. Analytical methods for nucleic acids and proteins (electrophoresis, MALDI-TOF MS, HPLC, etc.)
2. Synthetic methods for nucleic acids and proteins (in vitro transcription, cell-free translation, E. coli overexpression, directed evolution, etc.)
3. Peptide synthesis (MALDI-TOF MS, HPLC, etc.)

Textbook

Additional Reading

Molecular Biology of the Gene, James D. Watson, Tania A. Baker, Stephen P. Bell, Alexander Gann, Michael Levine, Richard Losick ISBN-10: 080539592X ISBN-13: 978-0805395921

Grade Assessment

Your overall grade in the class will be decided based on the following:- Oral presentation: 60%- Q&A session: 40%

Notes

Contacting Faculty

You can come to our lab. Otherwise you may contact us by phone or email. Prof. Murakami (Phone: 052-789-3327; Email: murah@chembio.nagoya-u.ac.jp) Prof. Hayashi (Phone: 052-789-3302; Email: hayashi@chembio.nagoya-u.ac.jp)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Experiment and Exercise		
Course Name	Biomolecular Engineering		
Starts 1	1 Spring Semester		
Lecturer	Hiroyuki ASANUMA Professor	Hiromu KASHIDA Associate Professor	Yukiko KAMIYA Associate Professor
	Keiji MURAYAMA Assistant Professor		

Course Purpose

In this course, students will conduct experiments on their own research themes. Students will learn how to design, synthesize, and analyze biomolecules including nucleic acids and proteins and skills for making plan for research. The goal of this course are: 1) Collecting data according to their research project.2) Surveying literatures and collecting the information and knowledges of skills related their research. 3) Promoting their research through discussion about obtained research results and information.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Experiment and Exercise	
Course Name	Biomolecular Engineering	
Starts 1	1 Autumn Semester	
Lecturer	Yoshinobu BABA Professor	Takao YASUI Associate Professor

Course Purpose

The aim of this course is to gain an understanding of nanobio-, bioanalytical-, and analytical-related research topics as well as data analysis and theoretical interpretation via learning nanobio-, bioanalytical-, and analytical-related research articles.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Experiment and Exercise	
Course Name	Biomolecular Engineering	
Starts 1	1 Autumn Semester	
Lecturer	Hiroshi MURAKAMI Professor	HAYASHI Gosuke Associate Professor

Course Purpose

The purpose of this class is to master various analytical and synthetic methods for biomolecules.

Prerequisite Subjects

Analytical Chemistry, Organic Chemistry, Biochemistry, and Molecular Biology

Course Topics

1. Analytical methods for nucleic acids and proteins (electrophoresis, MALDI-TOF MS, HPLC, etc.)2. Synthetic methods for nucleic acids and proteins (in vitro transcription, cell-free translation, E. coli overexpression, directed evolution, etc.)3. Peptide synthesis (MALDI-TOF MS, HPLC, etc.)

Textbook

N/A

Additional Reading

Molecular Biology of the Gene, James D. Watson, Tania A. Baker, Stephen P. Bell, Alexander Gann, Michael Levine, Richard Losick ISBN-10: 080539592X ISBN-13: 978-0805395921

Grade Assessment

Your overall grade in the class will be decided based on the following:- Oral presentation: 60%- Q&A session: 40%

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Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Experiment and Exercise		
Course Name	Biomolecular Engineering		
Starts 1	1 Autumn Semester		
Lecturer	Hiroyuki ASANUMA Professor	Hiromu KASHIDA Associate Professor	Yukiko KAMIYA Associate Professor
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- 3) Promoting their research through discussion about obtained research results and information.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Experiment and Exercise	
Course Name	Biomolecular Engineering	
Starts 1	2 Spring Semester	
Lecturer	Yoshinobu BABA Professor	Takao YASUI Associate Professor

Course Purpose

The aim of this course is to gain an understanding of nanobio-, bioanalytical-, and analytical-related research topics as well as data analysis and theoretical interpretation via learning nanobio-, bioanalytical-, and analytical-related research articles.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Experiment and Exercise	
Course Name	Biomolecular Engineering	
Starts 1	2 Spring Semester	
Lecturer	Hiroshi MURAKAMI Professor	HAYASHI Gosuke Associate Professor

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Prerequisite Subjects

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Textbook

Additional Reading

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Grade Assessment

Your overall grade in the class will be decided based on the following:- Oral presentation: 60%- Q&A session: 40%

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Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Experiment and Exercise		
Course Name	Biomolecular Engineering		
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Lecturer	Hiroyuki ASANUMA Professor	Hiromu KASHIDA Associate Professor	Yukiko KAMIYA Associate Professor
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Course Purpose

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- 2) Surveying literatures and collecting the information and knowledges of skills related their research.
- 3) Promoting their research through discussion about obtained research results and information.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Experiment and Exercise	
Course Name	Biomolecular Engineering	
Starts 1	2 Autumn Semester	
Lecturer	Yoshinobu BABA Professor	Takao YASUI Associate Professor

Course Purpose

The aim of this course is to gain an understanding of nanobio-, bioanalytical-, and analytical-related research topics as well as data analysis and theoretical interpretation via learning nanobio-, bioanalytical-, and analytical-related research articles.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Course Type	Specialized Courses	
Division at course	Master's Course	
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Course Name	Biomolecular Engineering	
Starts 1	2 Autumn Semester	
Lecturer	Hiroshi MURAKAMI Professor	HAYASHI Gosuke Associate Professor

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Prerequisite Subjects

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Course Topics

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Textbook

N/A

Additional Reading

Molecular Biology of the Gene,James D. Watson, Tania A. Baker, Stephen P. Bell, Alexander Gann, Michael Levine, Richard LosickISBN-10: 080539592XISBN-13: 978-0805395921

Grade Assessment

Your overall grade in the class will be decided based on the following:- Oral presentation: 60%- Q&A session: 40%

Notes

Contacting Faculty

You can come to our lab. Otherwise you may contact us by phone or email.Prof. Murakami (Phone: 052-789-3327; Email: murah@chembio.nagoya-u.ac.jp)Prof. Hayashi (Phone: 052-789-3302; Email: hayashi@chembio.nagoya-u.ac.jp)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Experiment and Exercise		
Course Name	Biomolecular Engineering		
Starts 1	2 Autumn Semester		
Lecturer	Hiroyuki ASANUMA Professor	Hiromu KASHIDA Associate Professor	Yukiko KAMIYA Associate Professor
	Keiji MURAYAMA Assistant Professor		

Course Purpose

In this course, students will conduct experiments on their own research themes. Students will learn how to design, synthesize, and analyze biomolecules including nucleic acids and proteins and skills for making plan for research. The goal of this course are:

- 1) Collecting data according to their research project.
- 2) Surveying literatures and collecting the information and knowledges of skills related their research.
- 3) Promoting their research through discussion about obtained research results and information.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Experiment and Exercise	
Course Name	Biomolecular Engineering	
Starts 1	1 Spring Semester	
Lecturer	KIYONAKA Shigeki Professor	Hidenori KANEOKA Assistant Professor

Course Purpose

The purpose of this class is to acquire the skill for making a plan for research project in the important issue in chemical genetics field and to obtain the basic skills in chemical genetics experiments.

The goal by learning this class is to obtain the following ability.

1. To obtain experimental skill required for chemical genetics field.
2. To survey related papers, and plan the research project.
3. To promote research and report and discuss the results.

Review literature and collect data according to weekly research plan.

Prerequisite Subjects

Chemistry and Biotechnology Laboratory 1-4, Graduation Thesis A, B.

Course Topics

1. Survey of related papers, and planning the research project. 2. Data collection using experimental skill obtained. 3. Report of the results and discussion.

Textbook

Introduce in the class.

Additional Reading

Introduce in the class.

Grade Assessment

Grade will be decided based on the following: presentation, oral examination.

Notes

No requirements.

Contacting Faculty

contact: kiyonaka@chembio.nagoya-u.ac.jp Phone 052-789-4275

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Experiment and Exercise	
Course Name	Biomolecular Engineering	
Starts 1	1 Spring Semester	
Lecturer	Hiroyuki HONDA Professor	Kazunori SHIMIZU Associate Professor

Course Purpose

The purpose of this course is to understand technical basics in biotechnology fields and to learn engineering sense from a biotechnological standpoint. By learning this lecture, the goal is to be able to: 1. Select recent academic papers in basics and applications in the field of biotechnology. 2. Understand recent research methods. 3. Understand and analyze recent topics on the future development.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Experiment and Exercise		
Course Name	Biomolecular Engineering		
Starts 1	1 Spring Semester		
Lecturer	Katsutoshi HORI Professor	Atuo SUZUKI Associate Professor	HajimeNAKATANI Lecturer
	Masahito ISHIKAWA Assistant Professor		

Course Purpose

The purpose of this course is to acquire experimental skills for engineering bacteria and proteins through various experiments and exercises. Achievement objective 1. Students can conduct various experiments for functional analysis of bacteria and proteins, and can evaluate the resulting data. 2. Students can insert or delete target gene to or from genome or plasmid, and evaluate resulting change in phenotypes. 3. Students can design, express, and purify recombinant proteins.

Prerequisite Subjects

Biochemistry (1, 2, 3, 4, 5) with Exercises

Course Topics

1. Genetic recombination 2. Recombinant protein expression 3. Protein purification and purity evaluation, 4. Western Blotting, 5. Confocal laser scanning microscopy, 6. Flow cytometry, 7. Immunoprecipitation and pull-down assay, 8. Circular dichroism spectroscopy, 9. Protein crystallography Pre-learning about the experiment methods before each class. After a series of experiments, give an oral presentation about the experiment and submit a report.

Textbook

None of textbook. Distribute recent papers as needed.

Additional Reading

We introduce articles or textbooks as appropriate as the seminar progresses.

Grade Assessment

Achievement score is evaluated by reports(40%), presentations(40%) and oral examinations(20%). Passing score is over 60 out of 100 points.

Notes

No course requirements.

Contacting Faculty

Ask anything at any working time.

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Experiment and Exercise	
Course Name	Biomolecular Engineering	
Starts 1	1 Autumn Semester	
Lecturer	KIYONAKA Shigeki Professor	Hidenori KANEOKA Assistant Professor

Course Purpose

The purpose of this class is to acquire the skill for making a plan for research project in the important issue in chemical genetics field and to obtain the basic skills in chemical genetics experiments.

The goal by learning this class is to obtain the following ability.

1. To obtain experimental skill required for chemical genetics field.
2. To survey related papers, and plan the research project.
3. To promote research and report and discuss the results.

Prerequisite Subjects

Chemistry and Biotechnology Laboratory 1-4, Graduation Thesis A, B.

Course Topics

1. Survey of related papers, and planning the research project.
2. Data collection using experimental skill obtained.
3. Report of the results and discussion.

Review literature and collect data according to weekly research plan.

Textbook

Introduce in the class.

Additional Reading

Introduce in the class.

Grade Assessment

Grade will be decided based on the following: presentation, oral examination.

Notes

No requirements.

Contacting Faculty

contact: kiyonaka@chembio.nagoya-u.ac.jp Phone 052-789-4275

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Experiment and Exercise	
Course Name	Biomolecular Engineering	
Starts 1	1 Autumn Semester	
Lecturer	Hiroyuki HONDA Professor	Kazunori SHIMIZU Associate Professor

Course Purpose

The purpose of this course is to understand technical basics in biotechnology fields and to learn engineering sense from a biotechnological standpoint. By learning this lecture, the goal is to be able to: 1. Select recent academic papers in basics and applications in the field of biotechnology. 2. Understand recent research methods. 3. Understand and analyze recent topics on the future development.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Experiment and Exercise		
Course Name	Biomolecular Engineering		
Starts 1	1 Autumn Semester		
Lecturer	Katsutoshi HORI Professor	Atuo SUZUKI Associate Professor	HajimeNAKATANI Lecturer
	Masahito ISHIKAWA Assistant Professor		

Course Purpose

The purpose of this course is to acquire experimental skills for engineering bacteria and proteins through various experiments and exercises. Achievement objective 1. Students can conduct various experiments for functional analysis of bacteria and proteins, and can evaluate the resulting data. 2. Students can insert or delete target gene to or from genome or plasmid, and evaluate resulting change in phenotypes. 3. Students can design, express, and purify recombinant proteins.

Prerequisite Subjects

Biochemistry (1, 2, 3, 4, 5) with Exercises

Course Topics

1. Genetic recombination 2. Recombinant protein expression 3. Protein purification and purity evaluation, 4. Western Blotting, 5. Confocal laser scanning microscopy, 6. Flow cytometry, 7. Immunoprecipitation and pull-down assay, 8. Circular dichroism spectroscopy, 9. Protein crystallography Pre-learning about the experiment methods before each class. After a series of experiments, give an oral presentation about the experiment and submit a report.

Textbook

None of textbook. Distribute recent papers as needed.

Additional Reading

We introduce articles or textbooks as appropriate as the seminar progresses.

Grade Assessment

Achievement score is evaluated by reports(40%), presentations(40%) and oral examinations(20%). Passing score is over 60 out of 100 points.

Notes

No course requirements.

Contacting Faculty

Ask anything at any working time.

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Experiment and Exercise	
Course Name	Biomolecular Engineering	
Starts 1	2 Spring Semester	
Lecturer	KIYONAKA Shigeki Professor	Hidenori KANEOKA Assistant Professor

Course Purpose

The purpose of this class is to acquire the skill for making a plan for research project in the important issue in chemical genetics field and to obtain the basic skills in chemical genetics experiments.

The goal by learning this class is to obtain the following ability.

1. To obtain experimental skill required for chemical genetics field.
2. To survey related papers, and plan the research project.
3. To promote research and report and discuss the results.

Prerequisite Subjects

Chemistry and Biotechnology Laboratory 1-4, Graduation Thesis A, B.

Course Topics

1. Survey of related papers, and planning the research project.
2. Data collection using experimental skill obtained.
3. Report of the results and discussion.

Review literature and collect data according to weekly research plan.

Textbook

Introduce in the class.

Additional Reading

Introduce in the class.

Grade Assessment

Grade will be decided based on the presentation and oral examination.

Notes

No requirements.

Contacting Faculty

contact: kiyonaka@chembio.nagoya-u.ac.jp Phone 052-789-4275

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Experiment and Exercise	
Course Name	Biomolecular Engineering	
Starts 1	2 Spring Semester	
Lecturer	Hiroyuki HONDA Professor	Kazunori SHIMIZU Associate Professor

Course Purpose

The purpose of this course is to understand technical basics in biotechnology fields and to learn engineering sense from a biotechnological standpoint. By learning this lecture, the goal is to be able to: 1. Select recent academic papers in basics and applications in the field of biotechnology. 2. Understand recent research methods. 3. Understand and analyze recent topics on the future development.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Experiment and Exercise		
Course Name	Biomolecular Engineering		
Starts 1	2 Spring Semester		
Lecturer	Katsutoshi HORI Professor	Atuo SUZUKI Associate Professor	HajimeNAKATANI Lecturer
	Masahito ISHIKAWA Assistant Professor		

Course Purpose

The purpose of this course is to acquire experimental skills for engineering bacteria and proteins through various experiments and exercises. Achievement objective 1. Students can conduct various experiments for functional analysis of bacteria and proteins, and can evaluate the resulting data. 2. Students can insert or delete target gene to or from genome or plasmid, and evaluate resulting change in phenotypes. 3. Students can design, express, and purify recombinant proteins.

Prerequisite Subjects

Biochemistry (1, 2, 3, 4, 5) with Exercises

Course Topics

1. Genetic recombination 2. Recombinant protein expression 3. Protein purification and purity evaluation, 4. Western Blotting, 5. Confocal laser scanning microscopy, 6. Flow cytometry, 7. Immunoprecipitation and pull-down assay, 8. Circular dichroism spectroscopy, 9. Protein crystallography Pre-learning about the experiment methods before each class. After a series of experiments, give an oral presentation about the experiment and submit a report.

Textbook

None of textbook. Distribute recent papers as needed.

Additional Reading

We introduce articles or textbooks as appropriate as the seminar progresses.

Grade Assessment

Achievement score is evaluated by reports(40%), presentations(40%) and oral examinations(20%). Passing score is over 60 out of 100 points.

Notes

No course requirements.

Contacting Faculty

Ask anything at any working time.

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Experiment and Exercise	
Course Name	Biomolecular Engineering	
Starts 1	2 Autumn Semester	
Lecturer	KIYONAKA Shigeki Professor	Hidenori KANEOKA Assistant Professor

Course Purpose

The purpose of this class is to acquire the skill for making a plan for research project in the important issue in chemical genetics field and to obtain the basic skills in chemical genetics experiments.

The goal by learning this class is to obtain the following ability.

1. To obtain experimental skill required for chemical genetics field.
2. To survey related papers, and plan the research project.
3. To promote research and report and discuss the results.

Prerequisite Subjects

Chemistry and Biotechnology Laboratory 1-4, Graduation Thesis A, B.

Course Topics

1. Survey of related papers, and planning the research project.
2. Data collection using experimental skill obtained.
3. Report of the results and discussion.

Review literature and collect data according to weekly research plan.

Textbook

Introduce in the class.

Additional Reading

Introduce in the class.

Grade Assessment

Grade will be decided based on the presentation and oral examination.

Notes

No requirements.

Contacting Faculty

contact: kiyonaka@chembio.nagoya-u.ac.jp Phone 052-789-4275

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Experiment and Exercise	
Course Name	Biomolecular Engineering	
Starts 1	2 Autumn Semester	
Lecturer	Hiroyuki HONDA Professor	Kazunori SHIMIZU Associate Professor

Course Purpose

The purpose of this course is to understand technical basics in biotechnology fields and to learn engineering sense from a biotechnological standpoint. By learning this lecture, the goal is to be able to: 1. Select recent academic papers in basics and applications in the field of biotechnology. 2. Understand recent research methods. 3. Understand and analyze recent topics on the future development.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Experiment and Exercise		
Course Name	Biomolecular Engineering		
Starts 1	2 Autumn Semester		
Lecturer	Katsutoshi HORI Professor	Atuo SUZUKI Associate Professor	HajimeNAKATANI Lecturer
	Masahito ISHIKAWA Assistant Professor		

Course Purpose

The purpose of this course is to acquire experimental skills for engineering bacteria and proteins through various experiments and exercises. Achievement objective 1. Students can conduct various experiments for functional analysis of bacteria and proteins, and can evaluate the resulting data. 2. Students can insert or delete target gene to or from genome or plasmid, and evaluate resulting change in phenotypes. 3. Students can design, express, and purify recombinant proteins.

Prerequisite Subjects

Biochemistry (1, 2, 3, 4, 5) with Exercises

Course Topics

1. Genetic recombination 2. Recombinant protein expression 3. Protein purification and purity evaluation, 4. Western Blotting, 5. Confocal laser scanning microscopy, 6. Flow cytometry, 7. Immunoprecipitation and pull-down assay, 8. Circular dichroism spectroscopy, 9. Protein crystallography Pre-learning about the experiment methods before each class. After a series of experiments, give an oral presentation about the experiment and submit a report.

Textbook

None of textbook. Distribute recent papers as needed.

Additional Reading

We introduce articles or textbooks as appropriate as the seminar progresses.

Grade Assessment

Achievement score is evaluated by reports(40%), presentations(40%) and oral examinations(20%). Passing score is over 60 out of 100 points.

Notes

No course requirements.

Contacting Faculty

Ask anything at any working time.

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

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

documents that a lecturer (DP) introduces it and shows.

Additional Reading

documents that a lecturer (DP) introduces it and shows.

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

There are no prerequisites

Contacting Faculty

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

Research Internship 1 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	1 Spring and Autumn Semester
Lecturer	Hiroshi IKUTA 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

documents that the staff instructing the training in the company introduces it and shows

Additional Reading

documents that the staff instructing the training in the company introduces it and shows

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

The student that I subscribed for the training theme of the company, and acceptance was accepted.

Contacting Faculty

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

Research Internship 1 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	1 Spring and Autumn Semester
Lecturer	Hiroshi IKUTA 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

documents that the staff instructing the training in the company introduces it and shows

Additional Reading

documents that the staff instructing the training in the company introduces it and shows

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

The student that I subscribed for the training theme of the company, and acceptance was accepted.

Contacting Faculty

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

Research Internship 1 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	1 Spring and Autumn Semester
Lecturer	Hiroshi IKUTA 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

documents that the staff instructing the training in the company introduces it and shows

Additional Reading

documents that the staff instructing the training in the company introduces it and shows

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

The student that I subscribed for the training theme of the company, and acceptance was accepted.

Contacting Faculty

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

Research Internship 1 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	1 Spring and Autumn Semester
Lecturer	Hiroshi IKUTA 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

documents that the staff instructing the training in the company introduces it and shows

Additional Reading

documents that the staff instructing the training in the company introduces it and shows

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

The student that I subscribed for the training theme of the company, and acceptance was accepted.

Contacting Faculty

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

Research Internship 1 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	1 Spring and Autumn Semester
Lecturer	Hiroshi IKUTA 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

documents that the staff instructing the training in the company introduces it and shows

Additional Reading

documents that the staff instructing the training in the company introduces it and shows

Grade Assessment

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

Notes

The student that I subscribed for the training theme of the company, and acceptance was accepted.

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 review 2. Formulating the research plan 3. Analyzing the results and discussion 4. Presentation of the results After 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 review 2. Formulating the research plan 3. Analyzing the results and discussion 4. Presentation of the results After 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 review 2. Formulating the research plan 3. Analyzing the results and discussion 4. Presentation of the results After 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 review 2. Formulating the research plan 3. Analyzing the results and discussion 4. Presentation of the results After 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 review 2. Formulating the research plan 3. Analyzing the results and discussion 4. Presentation of the results After 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.

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	Tatsuya SUZUKI Professor		

Course Purpose

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

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

Prerequisite Subjects

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

Course Topics

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

Submission of the report after each class is mandatory.

Textbook

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

Additional Reading

Original lecture notes will be provided at each class.

Grade Assessment

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

Notes

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

Contacting Faculty

After each class student can ask in person.

Otherwise, contact to:

Pro. Suzuki

Ext. 2700, t_suzuki@nuem.nagoya-u.ac.jp

Seminar on medical engineering (2.0credits) (医工連携セミナー)

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Materials Process Engineering	Chemical Systems Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace 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	
Lecturer	Associated Faculty		

Course Purpose

In the coming decades with growing overage population, novel technologies and outstanding ideas for the new breakthrough strategy of tailor-made medical therapy is strongly required. For the establishment of such strategy, basic technologies that enable the detection and diagnosis of molecular dynamics should be investigated. In this class, we try to educate young researchers to step out to this new frontier by setting various types of classes held by very advanced researchers in medical engineering field in Nagoya University. The lecturers are invited from engineering faculty and medical faculty, and introduce the expected ideas and the most recent achievements in the aspect of medical engineering.

1. Explain the importance of medical engineering research
2. Explain the outline of medical engineering research in Nagoya University
3. Explain the potential engineering ability needed for committing in medical engineering field

Prerequisite Subjects

Clinical medicine, Molecular biology, Biological engineering, Biomechanics, Robotics, Medical engineering, Bioinformatics

Course Topics

In every lecture, different lectures invited from different fields (engineer, doctors, etc.) teach the most recent advances in the field of medical engineering.

The following viewpoint will be focused

1. Propose the engineering techniques needed in clinical research or treatment
2. Propose the analytical methods for clinical research or treatment
3. Introduce the engineering techniques with high potency for clinical research

The lecture is mostly presented by power point, and for some classes, handouts are provided.

Textbook

Not specified, but distributed handouts if necessary.

Additional Reading

It will be appointed if necessary.

Grade Assessment

Reports (80%) and interview (20%)

Notes

Not needed

Contacting Faculty

At lecture time

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	1 Spring and Autumn Semester
Lecturer	Syusaku NAGANO Associate Professor		

Course Purpose

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

Prerequisite Subjects

Knowledge of the subject areas.

Course Topics

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

Textbook

Distribute as appropriate.

Additional Reading

Distribute as appropriate.

Grade Assessment

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

proposals.

Notes

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

Contacting Faculty

Arranging the schedules by e-mail and etc.

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

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

Course Purpose

To research in advanced engineering, it is necessary to learn the latest research trends through practice. The purpose of this experiment is to find the research issues on one's own and conduct research experiments using the latest experimental equipment and molecular simulation technology.

Through this experiment, you will be able to understand the principles of the Raman spectrometer, ionization potential measurement, X-ray diffraction etc. and molecular simulation software and learn how to use them practically. The goal is to comprehensively acquire the knowledge, skills, and presentation techniques related to advanced experiments necessary for conducting the research that was the subject.

Prerequisite Subjects

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

Course Topics

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

Textbook

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

Additional Reading

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

Grade Assessment

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

Notes

No course requirements.

Contacting Faculty

Arranging the schedules by e-mail and etc.

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

Course Type	Comprehensive engineering courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Applied Physics	Materials Physics	Materials Design Innovation Engineering
	Materials Process Engineering	Chemical Systems Engineering	Electrical Engineering
	Electronics	Information and Communication Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	Department of Energy Engineering
	Department of Applied Energy	Civil and Environmental Engineering	Graduate Chemistry
	Graduate Chemistry	Automotive Engineering	Automotive Engineering
	Civil and Environmental 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 hesitation
- Grasp the characteristics of successful presentations
- Use techniques learned in class in their own presentation

Prerequisite Subjects

English language classes for Japanese students

Japanese language classes for international students

Course Topics

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

(8) Individual presentations

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

Textbook

Handouts will be distributed in class

Additional Reading

1The Japan Times

2:

Grade Assessment

Individual presentation: 50%

Active class participation: 50%

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

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

Notes

There are no requirements for taking this class.

Contacting Faculty

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

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	Yukio ISHIDA 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 report 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 understanding of the concepts is especially evaluated.

Summing up the all scores from (a) to (d) and the students with evaluation A, B, or C can pass this subject.

Notes

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

Contacting Faculty

Mainly accepted during each lecture. Other general questions are accepted by Professor Yukio Ishida.

<Contact> TEL: 052-747-6797, Email: ishida@nuem.nagoya-u.ac.jp

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

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

Course Purpose

This is a course to acquire basic skills to summarize research as a paper in English. By the end of the course, students will be able to ...

- explain the basic structure of science and technology research paper
- list essential components of each section of research paper
- type short multiple-paragraph essays with appropriate punctuation
- orally express logically structured opinion

Prerequisite Subjects

Various subjects relating to English

Course Topics

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

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

Textbook

None. Students will receive handouts in each class session.

Additional Reading

Glasman-Deal, H. (2010). Science Research Writing For Non-Native Speakers of English. Imperial College Press.

Swales, J.M. & Feak, C.B. (2012). Academic Writing for Graduate Students. The University of Michigan Press.

Wallwork, A. (2013). English for Academic Research: Grammar, Usage and Style. Springer.

Wallwork, A. (2016). English for Writing Research Papers. Springer.

Grade Assessment

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

Notes

There are no prerequisites

Contacting Faculty

Email address to be announced in the first class

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

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	Syusaku NAGANO Associate Professor		

Course Purpose

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

Prerequisite Subjects

Course Topics

Textbook

Distribute materials as appropriate.

Additional Reading

Grade Assessment

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

Notes

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

Contacting Faculty

the break after the lecture.

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

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	1 Autumn Semester
Lecturer	Syusaku NAGANO Associate Professor	Akitoshi EDAGAWA Visiting Professor	

Course Purpose

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

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Internship A (1.0credits) (学外実習 A)

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

Course Purpose

In the course of the internship program, students make research works concerning predetermined themes in research and developing sections of university-outsider research organization such as cooperating companies etc. 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 research organization activities, and to have the wide knowledge of the practical aspects of the scientific and engineering fields they are studying in the university.

Prerequisite Subjects

Each subject studied in Department of Chemistry and Biotechnology and also in Department of Biomolecular Engineering

Course Topics

Students' research contents are negotiated by agreement with the companies etc.

Textbook

Nothing in particular

Additional Reading

Nothing in particular

Grade Assessment

The achievement is evaluation by corporate leaders, oral presentations of research results, and reports

Notes

Course conditions and notes vary depending on the situation of each hosting company.

Contacting Faculty

Academic advisors and persons in charge of hosting companies etc.

International Cooperative Research Project U2 (2.0credits) (国際共同研究 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
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
Lecturer	Associated Faculty	Associated Faculty	Associated Faculty

Course Purpose

The purpose of this international project is to develop young researchers who have comprehensive and international abilities and can play an active role internationally.

Through this project, students will be able to

- 1) make an original research plan and perform it.
- 2) communicate and discuss with other foreign researchers in English fluently.
- 3) enhance their research and presentation skills.

Prerequisite Subjects

Basic engineering classes, English, Technical English

Course Topics

Experience R & D at overseas research institutes as follows.

- 1) Set a research theme and make a research plan based on discussions with overseas supervisors and conduct research.
- 2) Present your research results in English at your place of stay and discuss.
- 3) After returning to Japan, report the contents of research activities to the supervisor and receive comprehensive evaluation.

Textbook

Will be designated by the supervisor in the visiting university (or research group).

Additional Reading

Will be designated by the supervisor in the visiting university (or research group).

Grade Assessment

Receive the evaluation of the instructor in your stay regarding the theme setting, research ability, and discussion method at the joint research destination. After returning to Japan, submit and present a report to the supervisor of the University. If the above results are comprehensively evaluated and it is deemed that sufficient research achievement ability has been acquired, the credits will be awarded.

Notes

Credits will be given based on the period that the student studied at the visiting university (or research group).

[U2]2.0 credits: Period of students' stay: less than 20 days.

Contacting Faculty

Ask to the supervisors in Nagoya university and visiting research group.

International Cooperative Research Project U3 (3.0credits) (国際共同研究 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
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
Lecturer	Associated Faculty	Associated Faculty	Associated Faculty

Course Purpose

The purpose of this international project is to develop young researchers who have comprehensive and international abilities and can play an active role internationally. Through this project, students will be able to 1) make an original research plan and perform it. 2) communicate and discuss with other foreign researchers in English fluently. 3) enhance their research and presentation skills.

Prerequisite Subjects

Basic engineering classes, English, Technical English

Course Topics

Experience R & D at overseas research institutes as follows. 1) Set a research theme and make a research plan based on discussions with overseas supervisors and conduct research. 2) Present your research results in English at your place of stay and discuss. 3) After returning to Japan, report the contents of research activities to the supervisor and receive comprehensive evaluation.

Textbook

Will be designated by the supervisor in the visiting university (or research group).

Additional Reading

Will be designated by the supervisor in the visiting university (or research group).

Grade Assessment

Receive the evaluation of the instructor in your stay regarding the theme setting, research ability, and discussion method at the joint research destination. After returning to Japan, submit and present a report to the supervisor of the University. If the above results are comprehensively evaluated and it is deemed that sufficient research achievement ability has been acquired, the credits will be awarded.

Notes

The grading will be based on the evaluation of the supervisor at the joint research group, and the reports and presentations after their return to Japan. [U3] 3.0 credits: Period of students' stay: From 21 days to 40 days

Contacting Faculty

Ask to the supervisors in Nagoya university and visiting research group.

International Cooperative Research Project U4 (4.0credits) (国際共同研究 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
Starts 1	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
Lecturer	Associated Faculty	Associated Faculty	Associated Faculty

Course Purpose

The purpose of this international project is to develop young researchers who have comprehensive and international abilities and can play an active role internationally.

Through this project, students will be able to

- 1) make an original research plan and perform it.
- 2) communicate and discuss with other foreign researchers in English fluently.
- 3) enhance their research and presentation skills.

Prerequisite Subjects

Basic engineering classes, English, Technical English

Course Topics

Experience R & D at overseas research institutes as follows.

- 1) Set a research theme and make a research plan based on discussions with overseas supervisors and conduct research.
- 2) Present your research results in English at your place of stay and discuss.
- 3) After returning to Japan, report the contents of research activities to the supervisor and receive comprehensive evaluation.

Textbook

Will be designated by the supervisor in the visiting university (or research group).

Additional Reading

Will be designated by the supervisor in the visiting university (or research group).

Grade Assessment

Receive the evaluation of the instructor in your stay regarding the theme setting, research ability, and discussion method at the joint research destination. After returning to Japan, submit and present a report to the supervisor of the University. If the above results are comprehensively evaluated and it is deemed that sufficient research achievement ability has been acquired, the credits will be awarded.

Notes

Credits will be given based on the period that the student studied at the visiting university (or research group).

[U4]4.0 credits: Period of students' stay: more than 41 days.

Contacting Faculty

Ask to the supervisors in Nagoya university and visiting research group.

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

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

Course Purpose

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

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

Prerequisite Subjects

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

Course Topics

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

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

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

Textbook

Original lecture note will be provided.

Additional Reading

It will be announced in the class if necessary.

Grade Assessment

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

Notes

No particular requirement.

Contacting Faculty

Office hour: Wed. 13:00-14:00 @ Green Vehicle Material Research Building 1F

Mail to: o_shimizu@nuem.nagoya-u.ac.jp

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

Course Purpose

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

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

Prerequisite Subjects

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

Course Topics

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

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

Class is performed based on group activity.

Textbook

Original lecture note will be provided.

Additional Reading

It will be announced in the class if necessary.

Grade Assessment

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

Notes

No particular requirement

Contacting Faculty

Office hour:Wed.13:00-14:00 @Green Vehicle Material Research Building 1F

Mail to: o_shimizu@nuem.nagoya-u.ac.jp

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

Course Purpose

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

Prerequisite Subjects

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

Course Topics

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

Textbook

Original lecture note will be provided.

Additional Reading

It will be announced in the class if necessary.

Grade Assessment

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

Notes

No particular requirement

Contacting Faculty

Office hour:Wed.13:00-14:00 @Green Vehicle Material Research Building 1FMail to:
o_shimizu@nuem.nagoya-u.ac.jp

International research project U2 (2.0credits) (国際プロジェクト研究 U2)

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	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 will 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 research project U3 (3.0credits) (国際プロジェクト研究 U3)

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	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 will 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 research project U4 (4.0credits) (国際プロジェクト研究 U4)

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	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 will 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 literature 2. Designing research plan 3. Analysis and discussion of results 4. Brief summary and future prospects 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

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 discussion Grading 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.

Seminar on Biomolecular Chemistry 2A (2.0credits) (分子生命化学セミナー 2A)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Biomolecular Engineering	
Starts 1	1 Spring Semester	
Lecturer	Yoshinobu BABA Professor	Takao YASUI Associate Professor

Course Purpose

The aim of this course is to gain an understanding of nanobio-, bioanalytical-, and analytical-related research topics as well as a research plan-do-check-act (PDCA) cycles via learning nanobio-, bioanalytical-, and analytical-related research articles.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Seminar on Biomolecular Chemistry 2A (2.0credits) (分子生命化学セミナー 2A)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Biomolecular Engineering		
Starts 1	1 Spring Semester		
Lecturer	Hiroshi MURAKAMI Professor	HAYASHI Gosuke Associate Professor	FUJINO Tomoshige Assistant Professor

Course Purpose

The purpose of this class is to gain an understanding of analytical and synthetic methods for biomolecules by reading advanced textbooks and research reports published in scientific journals.

Prerequisite Subjects

Analytical Chemistry, Organic Chemistry, Biochemistry, and Molecular Biology

Course Topics

1. Reading and explaining advanced textbooks
2. Reviewing research articles
3. Research proposals

Textbook

N/A

Additional Reading

Text books will be announced in the beginning of the course.

Grade Assessment

Your overall grade in the class will be decided based on the following:- Oral presentation: 60%- Q&A session: 40%

Notes

Contacting Faculty

You may contact me after a lecture. Otherwise you may contact us by phone or email. Prof. Murakami (Phone: 052-789-3327; Email: murah@chembio.nagoya-u.ac.jp) Prof. Hayashi (Phone: 052-789-3302; Email: hayashi@chembio.nagoya-u.ac.jp)

Seminar on Biomolecular Chemistry 2A (2.0credits) (分子生命化学セミナー 2A)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Biomolecular Engineering		
Starts 1	1 Spring Semester		
Lecturer	Hiroyuki ASANUMA Professor	Hiromu KASHIDA Associate Professor	Yukiko KAMIYA Associate Professor
	Keiji MURAYAMA Assistant Professor		

Course Purpose

This course is intend to gain understanding of basic concepts and recent topics of biopolymers and biomaterials including, synthetic method, structure, properties, and functions through presentation and discussion in seminar. Students will be given opportunities to prepare presentations, introduce research papers in journal club, and present research progress.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Seminar on Biomolecular Chemistry 2B (2.0credits) (分子生命化学セミナー 2B)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Biomolecular Engineering	
Starts 1	1 Autumn Semester	
Lecturer	Yoshinobu BABA Professor	Takao YASUI Associate Professor

Course Purpose

The aim of this course is to gain an understanding of nanobio-, bioanalytical-, and analytical-related research topics as well as a research plan-do-check-act (PDCA) cycles via learning nanobio-, bioanalytical-, and analytical-related research articles.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Seminar on Biomolecular Chemistry 2B (2.0credits) (分子生命化学セミナー 2B)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Biomolecular Engineering		
Starts 1	1 Autumn Semester		
Lecturer	Hiroshi MURAKAMI Professor	HAYASHI Gosuke Associate Professor	FUJINO Tomoshige Assistant Professor

Course Purpose

The purpose of this class is to gain an understanding of analytical and synthetic methods for biomolecules by reading advanced textbooks and research reports published in scientific journals.

Prerequisite Subjects

Analytical Chemistry, Organic Chemistry, Biochemistry, and Molecular Biology

Course Topics

1. Reading and explaining advanced textbooks
2. Reviewing research articles
3. Research proposals

Textbook

Additional Reading

Text books will be announced in the beginning of the course.

Grade Assessment

Your overall grade in the class will be decided based on the following:- Oral presentation: 60%- Q&A session: 40%

Notes

Contacting Faculty

You may contact me after a lecture. Otherwise you may contact us by phone or email. Prof. Murakami (Phone: 052-789-3327; Email: murah@chembio.nagoya-u.ac.jp) Prof. Hayashi (Phone: 052-789-3302; Email: hayashi@chembio.nagoya-u.ac.jp)

Seminar on Biomolecular Chemistry 2B (2.0credits) (分子生命化学セミナー 2B)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Biomolecular Engineering		
Starts 1	1 Autumn Semester		
Lecturer	Hiroyuki ASANUMA Professor	Hiromu KASHIDA Associate Professor	Yukiko KAMIYA Associate Professor
	Keiji MURAYAMA Assistant Professor		

Course Purpose

This course is intend to gain understanding of basic concepts and recent topics of biopolymers and biomaterials including, synthetic method, structure, properties, and functions through presentation and discussion in seminar. Students will be given opportunities to prepare presentations, introduce research papers in journal club, and present research progress.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Seminar on Biomolecular Chemistry 2C (2.0credits) (分子生命化学セミナー-2C)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Biomolecular Engineering	
Starts 1	2 Spring Semester	
Lecturer	Yoshinobu BABA Professor	Takao YASUI Associate Professor

Course Purpose

The aim of this course is to gain an understanding of nanobio-, bioanalytical-, and analytical-related research topics as well as a research plan-do-check-act (PDCA) cycles via learning nanobio-, bioanalytical-, and analytical-related research articles.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Seminar on Biomolecular Chemistry 2C (2.0credits) (分子生命化学セミナー-2C)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Biomolecular Engineering		
Starts 1	2 Spring Semester		
Lecturer	Hiroshi MURAKAMI Professor	HAYASHI Gosuke Associate Professor	FUJINO Tomoshige Assistant Professor

Course Purpose

The purpose of this class is to gain an understanding of analytical and synthetic methods for biomolecules by reading advanced textbooks and research reports published in scientific journals.

Prerequisite Subjects

Analytical Chemistry, Organic Chemistry, Biochemistry, and Molecular Biology

Course Topics

1. Reading and explaining advanced textbooks
2. Reviewing research articles
3. Research proposals

Textbook

N/A

Additional Reading

Text books will be announced in the beginning of the course.

Grade Assessment

Your overall grade in the class will be decided based on the following:- Oral presentation: 60%- Q&A session: 40%

Notes

Contacting Faculty

You may contact me after a lecture. Otherwise you may contact us by phone or email. Prof. Murakami (Phone: 052-789-3327; Email: murah@chembio.nagoya-u.ac.jp) Prof. Hayashi (Phone: 052-789-3302; Email: hayashi@chembio.nagoya-u.ac.jp)

Seminar on Biomolecular Chemistry 2C (2.0credits) (分子生命化学セミナー -2C)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Biomolecular Engineering		
Starts 1	2 Spring Semester		
Lecturer	Hiroyuki ASANUMA Professor	Hiromu KASHIDA Associate Professor	Yukiko KAMIYA Associate Professor
	Keiji MURAYAMA Assistant Professor		

Course Purpose

This course is intend to gain understanding of basic concepts and recent topics of biopolymers and biomaterials including, synthetic method, structure, properties, and functions through presentation and discussion in seminar. Students will be given opportunities to prepare presentations, introduce research papers in journal club, and present research progress.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Seminar on Biomolecular Chemistry 2D (2.0credits) (分子生命化学セミナー 2D)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Biomolecular Engineering	
Starts 1	2 Autumn Semester	
Lecturer	Yoshinobu BABA Professor	Takao YASUI Associate Professor

Course Purpose

The aim of this course is to gain an understanding of nanobio-, bioanalytical-, and analytical-related research topics as well as a research plan-do-check-act (PDCA) cycles via learning nanobio-, bioanalytical-, and analytical-related research articles.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Seminar on Biomolecular Chemistry 2D (2.0credits) (分子生命化学セミナー 2D)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Biomolecular Engineering		
Starts 1	2 Autumn Semester		
Lecturer	Hiroshi MURAKAMI Professor	HAYASHI Gosuke Associate Professor	FUJINO Tomoshige Assistant Professor

Course Purpose

The purpose of this class is to gain an understanding of analytical and synthetic methods for biomolecules by reading advanced textbooks and research reports published in scientific journals.

Prerequisite Subjects

Analytical Chemistry, Organic Chemistry, Biochemistry, and Molecular Biology

Course Topics

1. Reading and explaining advanced textbooks
2. Reviewing research articles
3. Research proposals

Textbook

N/A

Additional Reading

Text books will be announced in the beginning of the course.

Grade Assessment

Your overall grade in the class will be decided based on the following:- Oral presentation: 60%- Q&A session: 40%

Notes

Contacting Faculty

You may contact me after a lecture. Otherwise you may contact us by phone or email. Prof. Murakami (Phone: 052-789-3327; Email: murah@chembio.nagoya-u.ac.jp) Prof. Hayashi (Phone: 052-789-3302; Email: hayashi@chembio.nagoya-u.ac.jp)

Seminar on Biomolecular Chemistry 2D (2.0credits) (分子生命化学セミナー 2D)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Biomolecular Engineering		
Starts 1	2 Autumn Semester		
Lecturer	Hiroyuki ASANUMA Professor	Hiromu KASHIDA Associate Professor	Yukiko KAMIYA Associate Professor
	Keiji MURAYAMA Assistant Professor		

Course Purpose

This course is intend to gain understanding of basic concepts and recent topics of biopolymers and biomaterials including, synthetic method, structure, properties, and functions through presentation and discussion in seminar. Students will be given opportunities to prepare presentations, introduce research papers in journal club, and present research progress.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Seminar on Biomolecular Chemistry 2E (2.0credits) (分子生命化学セミナー 2E)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Biomolecular Engineering	
Starts 1	3 Spring Semester	
Lecturer	Yoshinobu BABA Professor	Takao YASUI Associate Professor

Course Purpose

The aim of this course is to gain an understanding of nanobio-, bioanalytical-, and analytical-related research topics as well as a research plan-do-check-act (PDCA) cycles via learning nanobio-, bioanalytical-, and analytical-related research articles.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Seminar on Biomolecular Chemistry 2E (2.0credits) (分子生命化学セミナー 2E)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Biomolecular Engineering		
Starts 1	3 Spring Semester		
Lecturer	Hiroshi MURAKAMI Professor	HAYASHI Gosuke Associate Professor	FUJINO Tomoshige Assistant Professor

Course Purpose

The purpose of this class is to gain an understanding of analytical and synthetic methods for biomolecules by reading advanced textbooks and research reports published in scientific journals.

Prerequisite Subjects

Analytical Chemistry, Organic Chemistry, Biochemistry, and Molecular Biology

Course Topics

1. Reading and explaining advanced textbooks
2. Reviewing research articles
3. Research proposals

Textbook

N/A

Additional Reading

Text books will be announced in the beginning of the course.

Grade Assessment

Your overall grade in the class will be decided based on the following:- Oral presentation: 60%- Q&A session: 40%

Notes

Contacting Faculty

You may contact me after a lecture. Otherwise you may contact us by phone or email. Prof. Murakami (Phone: 052-789-3327; Email: murah@chembio.nagoya-u.ac.jp) Prof. Hayashi (Phone: 052-789-3302; Email: hayashi@chembio.nagoya-u.ac.jp)

Seminar on Biomolecular Chemistry 2E (2.0credits) (分子生命化学セミナー 2E)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Biomolecular Engineering		
Starts 1	3 Spring Semester		
Lecturer	Hiroyuki ASANUMA Professor	Hiromu KASHIDA Associate Professor	Yukiko KAMIYA Associate Professor
	Keiji MURAYAMA Assistant Professor		

Course Purpose

This course is intend to gain understanding of basic concepts and recent topics of biopolymers and biomaterials including, synthetic method, structure, properties, and functions through presentation and discussion in seminar. Students will be given opportunities to prepare presentations, introduce research papers in journal club, and present research progress.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Seminar on Biosystem Engineering 2A (2.0credits) (生命システム工学セミナー 2A)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Biomolecular Engineering	
Starts 1	1 Spring Semester	
Lecturer	KIYONAKA Shigeki Professor	Hidenori KANEOKA Assistant Professor

Course Purpose

The purpose of this seminar is to acquire advanced knowledge in the field of chemical genetics.

The goal by learning this class is to obtain the following ability.

1. To survey and select superior paper that leads to new concept or technology.
2. To summarize and present recent trends of the research.
3. To propose the direction of the research project.
4. To present and discuss research progress of own project.
5. Lead the free discussion.

Prerequisite Subjects

Biochemistry 1-5, Seminar on Biosystem Engineering 1A-1D, Advanced Experiments and Exercises in Biosystem Engineering 1-4

Course Topics

1. Journal club. 2. Research progress report. The course is proceeded with free discussion in the form of seminar.

Review literature and collect data according to weekly guidance.

Textbook

Introduce in the class.

Additional Reading

Introduce in the class.

Grade Assessment

Grade will be decided based on the presentation and oral examination.

Notes

No requirements.

Contacting Faculty

contact: kiyonaka@chembio.nagoya-u.ac.jp Phone 052-789-4275

Seminar on Biosystem Engineering 2A (2.0credits) (生命システム工学セミナー 2A)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Biomolecular Engineering	
Starts 1	1 Spring Semester	
Lecturer	Hiroyuki HONDA Professor	Kazunori SHIMIZU Associate Professor

Course Purpose

The purpose of this course is to introduce and analyze recent academic papers in biotechnology fields from the basic and applied aspects and to discuss future developments from a biotechnological standpoint. By learning this lecture, the goal is to be able to: 1. Select recent academic papers in basics and applications in the field of biotechnology. 2. Understand and explain the contents of them. 3. Propose future works relating to the papers introduced. 4. Explain the individual progress report and give an opinion on the future development.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Seminar on Biosystem Engineering 2A (2.0credits) (生命システム工学セミナー 2A)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Biomolecular Engineering		
Starts 1	1 Spring Semester		
Lecturer	Katsutoshi HORI Professor	Atuo SUZUKI Associate Professor	HajimeNAKATANI Lecturer
	Masahito ISHIKAWA Assistant Professor		

Course Purpose

Students brush up the skill for obtaining new references timely and for feedback to own research. Students brush up the skill for debating about the recent papers on various view points and evaluating the direction of the research.

Prerequisite Subjects

Fundamentals of Biosystem Engineering, Seminar on Biosystem Engineering (1A, 1B, 1C, 1D)

Course Topics

1. Article introduction 2. Presentation about progress in research You will introduce recent academic papers and report on your research progress in order, so be sure to prepare for your presentation before your turn.

Textbook

We introduce articles or textbooks as appropriate as the seminar progresses.

Additional Reading

We introduce articles or textbooks as appropriate as the seminar progresses.

Grade Assessment

Achievement score is evaluated by effort for preparation (20%), presentation (30%), response to questions (30%), and results of homework (20%).

Notes

No course requirements.

Contacting Faculty

Ask anything at any working time.

Seminar on Biosystem Engineering 2B (2.0credits) (生命システム工学セミナー 2B)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Biomolecular Engineering	
Starts 1	1 Autumn Semester	
Lecturer	KIYONAKA Shigeki Professor	Hidenori KANEOKA Assistant Professor

Course Purpose

The purpose of this seminar is to acquire advanced knowledge in the field of chemical genetics.

The goal by learning this class is to obtain the following ability.

1. To survey and select superior paper that leads to new concept or technology.
2. To summarize and present recent trends of the research.
3. To propose the direction of the research project.
4. To present and discuss research progress of own project.
5. Lead the free discussion.

Prerequisite Subjects

Biochemistry 1-5, Seminar on Biosystem Engineering 1A-1D, Advanced Experiments and Exercises in Biosystem Engineering 1-4

Course Topics

1. Journal club. 2. Research progress report. The course is proceeded with free discussion in the form of seminar.

Review literature and collect data according to weekly guidance.

Textbook

Introduce in the class.

Additional Reading

Introduce in the class.

Grade Assessment

Grade will be decided based on the presentation and oral examination.

Notes

No requirements.

Contacting Faculty

contact: kiyonaka@chembio.nagoya-u.ac.jp Phone 052-789-4275

Seminar on Biosystem Engineering 2B (2.0credits) (生命システム工学セミナー 2B)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Biomolecular Engineering	
Starts 1	1 Autumn Semester	
Lecturer	Hiroyuki HONDA Professor	Kazunori SHIMIZU Associate Professor

Course Purpose

The purpose of this course is to introduce and analyze recent academic papers in biotechnology fields from the basic and applied aspects and to discuss future developments from a biotechnological standpoint. By learning this lecture, the goal is to be able to: 1. Select recent academic papers in basics and applications in the field of biotechnology. 2. Understand and explain the contents of them. 3. Propose future works relating to the papers introduced. 4. Explain the individual progress report and give an opinion on the future development.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Seminar on Biosystem Engineering 2B (2.0credits) (生命システム工学セミナー 2B)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Biomolecular Engineering		
Starts 1	1 Autumn Semester		
Lecturer	Katsutoshi HORI Professor	Atuo SUZUKI Associate Professor	HajimeNAKATANI Lecturer
	Masahito ISHIKAWA Assistant Professor		

Course Purpose

Students brush up the skill for obtaining new references timely and for feedback to own research. Students brush up the skill for debating about the recent papers on various view points and evaluating the direction of the research.

Prerequisite Subjects

Fundamentals of Biosystem Engineering, Seminar on Biosystem Engineering (1A, 1B, 1C, 1D, 2A)

Course Topics

1. Article introduction 2. Presentation about progress in research You will introduce recent academic papers and report on your research progress in order, so be sure to prepare for your presentation before your turn.

Textbook

We introduce articles or textbooks as appropriate as the seminar progresses.

Additional Reading

We introduce articles or textbooks as appropriate as the seminar progresses.

Grade Assessment

Achievement score is evaluated by effort for preparation (20%), presentation (30%), response to questions (30%), and results of homework (20%).

Notes

No course requirements.

Contacting Faculty

Ask anything at any working time.

Seminar on Biosystem Engineering 2C (2.0credits) (生命システム工学セミナー 2C)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Biomolecular Engineering	
Starts 1	2 Spring Semester	
Lecturer	KIYONAKA Shigeki Professor	Hidenori KANEOKA Assistant Professor

Course Purpose

The purpose of this seminar is to acquire advanced knowledge in the field of chemical genetics.

The goal by learning this class is to obtain the following ability.

1. To survey and select superior paper that leads to new concept or technology.
2. To summarize and present recent trends of the research.
3. To propose the direction of the research project.
4. To present and discuss research progress of own project.
5. Lead the free discussion.

Prerequisite Subjects

Biochemistry 1-5, Seminar on Biosystem Engineering 1A-1D, Advanced Experiments and Exercises in Biosystem Engineering 1-4

Course Topics

1. Journal club. 2. Research progress report. The course is proceeded with free discussion in the form of seminar.

Review literature and collect data according to weekly guidance.

Textbook

Introduce in the class.

Additional Reading

Introduce in the class.

Grade Assessment

Grade will be decided based on the presentation and oral examination.

Notes

No requirements.

Contacting Faculty

contact: kiyonaka@chembio.nagoya-u.ac.jp Phone 052-789-4275

Seminar on Biosystem Engineering 2C (2.0credits) (生命システム工学セミナー 2C)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Biomolecular Engineering	
Starts 1	2 Spring Semester	
Lecturer	Hiroyuki HONDA Professor	Kazunori SHIMIZU Associate Professor

Course Purpose

The purpose of this course is to introduce and analyze recent academic papers in biotechnology fields from the basic and applied aspects and to discuss future developments from a biotechnological standpoint. By learning this lecture, the goal is to be able to: 1. Select recent academic papers in basics and applications in the field of biotechnology. 2. Understand and explain the contents of them. 3. Propose future works relating to the papers introduced. 4. Explain the individual progress report and give an opinion on the future development.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Seminar on Biosystem Engineering 2C (2.0credits) (生命システム工学セミナー 2C)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Biomolecular Engineering		
Starts 1	2 Spring Semester		
Lecturer	Katsutoshi HORI Professor	Atuo SUZUKI Associate Professor	HajimeNAKATANI Lecturer
	Masahito ISHIKAWA Assistant Professor		

Course Purpose

Students brush up the skill for obtaining new references timely and for feedback to own research. Students brush up the skill for debating about the recent papers on various view points and evaluating the direction of the research.

Prerequisite Subjects

Fundamentals of Biosystem Engineering, Seminar on Biosystem Engineering (1A, 1B, 1C, 1D, 2A, 2B)

Course Topics

1. Article introduction 2. Presentation about progress in research You will introduce recent academic papers and report on your research progress in order, so be sure to prepare for your presentation before your turn.

Textbook

We introduce articles or textbooks as appropriate as the seminar progresses.

Additional Reading

We introduce articles or textbooks as appropriate as the seminar progresses.

Grade Assessment

Achievement score is evaluated by effort for preparation (20%), presentation (30%), response to questions (30%), and results of homework (20%).

Notes

No course requirements.

Contacting Faculty

Ask anything at any working time.

Seminar on Biosystem Engineering 2D (2.0credits) (生命システム工学セミナー 2D)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Biomolecular Engineering	
Starts 1	2 Autumn Semester	
Lecturer	KIYONAKA Shigeki Professor	Hidenori KANEOKA Assistant Professor

Course Purpose

The purpose of this seminar is to acquire advanced knowledge in the field of chemical genetics.

The goal by learning this class is to obtain the following ability.

1. To survey and select superior paper that leads to new concept or technology.
2. To summarize and present recent trends of the research.
3. To propose the direction of the research project.
4. To present and discuss research progress of own project.
5. Lead the free discussion.

Prerequisite Subjects

Biochemistry 1-5, Seminar on Biosystem Engineering 1A-1D, Advanced Experiments and Exercises in Biosystem Engineering 1-4

Course Topics

1. Journal club. 2. Research progress report. The course is proceeded with free discussion in the form of seminar.

Review literature and collect data according to weekly guidance.

Textbook

Introduce in the class.

Additional Reading

Introduce in the class.

Grade Assessment

Grade will be decided based on the presentation and oral examination.

Notes

No requirements.

Contacting Faculty

contact: kiyonaka@chembio.nagoya-u.ac.jp Phone 052-789-4275

Seminar on Biosystem Engineering 2D (2.0credits) (生命システム工学セミナー 2D)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Biomolecular Engineering	
Starts 1	2 Autumn Semester	
Lecturer	Hiroyuki HONDA Professor	Kazunori SHIMIZU Associate Professor

Course Purpose

The purpose of this course is to introduce and analyze recent academic papers in biotechnology fields from the basic and applied aspects and to discuss future developments from a biotechnological standpoint. By learning this lecture, the goal is to be able to: 1. Select recent academic papers in basics and applications in the field of biotechnology. 2. Understand and explain the contents of them. 3. Propose future works relating to the papers introduced. 4. Explain the individual progress report and give an opinion on the future development.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Seminar on Biosystem Engineering 2D (2.0credits) (生命システム工学セミナー 2D)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Biomolecular Engineering		
Starts 1	2 Autumn Semester		
Lecturer	Katsutoshi HORI Professor	Atuo SUZUKI Associate Professor	HajimeNAKATANI Lecturer
	Masahito ISHIKAWA Assistant Professor		

Course Purpose

Students brush up the skill for obtaining new references timely and for feedback to own research. Students brush up the skill for debating about the recent papers on various view points and evaluating the direction of the research.

Prerequisite Subjects

Fundamentals of Biosystem Engineering, Seminar on Biosystem Engineering (1A, 1B, 1C, 1D, 2A, 2B, 2C)

Course Topics

1. Article introduction 2. Presentation about progress in research You will introduce recent academic papers and report on your research progress in order, so be sure to prepare for your presentation before your turn.

Textbook

We introduce articles or textbooks as appropriate as the seminar progresses.

Additional Reading

We introduce articles or textbooks as appropriate as the seminar progresses.

Grade Assessment

Achievement score is evaluated by effort for preparation (20%), presentation (30%), response to questions (30%), and results of homework (20%).

Notes

No course requirements.

Contacting Faculty

Ask anything at any working time.

Seminar on Biosystem Engineering 2E (2.0credits) (生命システム工学セミナー 2E)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Biomolecular Engineering	
Starts 1	3 Spring Semester	
Lecturer	KIYONAKA Shigeki Professor	Hidenori KANEOKA Assistant Professor

Course Purpose

The purpose of this seminar is to acquire advanced knowledge in the field of chemical genetics.

The goal by learning this class is to obtain the following ability.

1. To survey and select superior paper that leads to new concept or technology.
2. To summarize and present recent trends of the research.
3. To propose the direction of the research project.
4. To present and discuss research progress of own project.
5. Lead the free discussion.

Prerequisite Subjects

Biochemistry 1-5, Seminar on Biosystem Engineering 1A-1D, Advanced Experiments and Exercises in Biosystem Engineering 1-4

Course Topics

1. Journal club. 2. Research progress report. The course is proceeded with free discussion in the form of seminar.

Review literature and collect data according to weekly guidance.

Textbook

Introduce in the class.

Additional Reading

Introduce in the class.

Grade Assessment

Grade will be decided based on the presentation and oral examination.

Notes

No requirements.

Contacting Faculty

contact: kiyonaka@chembio.nagoya-u.ac.jp Phone 052-789-4275

Seminar on Biosystem Engineering 2E (2.0credits) (生命システム工学セミナー 2E)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Biomolecular Engineering	
Starts 1	3 Spring Semester	
Lecturer	Hiroyuki HONDA Professor	Kazunori SHIMIZU Associate Professor

Course Purpose

The purpose of this course is to introduce and analyze recent academic papers in biotechnology fields from the basic and applied aspects and to discuss future developments from a biotechnological standpoint. By learning this lecture, the goal is to be able to: 1. Select recent academic papers in basics and applications in the field of biotechnology. 2. Understand and explain the contents of them. 3. Propose future works relating to the papers introduced. 4. Explain the individual progress report and give an opinion on the future development.

Prerequisite Subjects

Course Topics

Textbook

Additional Reading

Grade Assessment

Notes

Contacting Faculty

Seminar on Biosystem Engineering 2E (2.0credits) (生命システム工学セミナー 2E)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Biomolecular Engineering		
Starts 1	3 Spring Semester		
Lecturer	Katsutoshi HORI Professor	Atuo SUZUKI Associate Professor	HajimeNAKATANI Lecturer
	Masahito ISHIKAWA Assistant Professor		

Course Purpose

Students brush up the skill for obtaining new references timely and for feedback to own research. Students brush up the skill for debating about the recent papers on various view points and evaluating the direction of the research.

Prerequisite Subjects

Fundamentals of Biosystem Engineering, Seminar on Biosystem Engineering (1A, 1B, 1C, 1D, 2A, 2B, 2C, 2D)

Course Topics

1. Article introduction 2. Presentation about progress in research You will introduce recent academic papers and report on your research progress in order, so be sure to prepare for your presentation before your turn.

Textbook

We introduce articles or textbooks as appropriate as the seminar progresses.

Additional Reading

We introduce articles or textbooks as appropriate as the seminar progresses.

Grade Assessment

Achievement score is evaluated by effort for preparation (20%), presentation (30%), response to questions (30%), and results of homework (20%).

Notes

No course requirements.

Contacting Faculty

Ask anything at any working time.

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	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

Nothing particularly needed

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	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

Nothing particularly needed

Contacting Faculty

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

Seminar on medical engineering (2.0credits) (医工連携セミナー)

Course Type	Comprehensive engineering courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Molecular and Macromolecular Chemistry	Materials Chemistry	Biomolecular Engineering
	Materials Process Engineering	Chemical Systems Engineering	Mechanical Systems Engineering
	Micro-Nano Mechanical Science and Engineering	Aerospace Engineering	
Starts 1	Spring Semester	Spring Semester	Spring Semester
	Spring Semester	Spring Semester	Spring Semester
	Spring Semester	Spring Semester	
Lecturer	Associated Faculty		

Course Purpose

In the coming decades with growing overage population, novel technologies and outstanding ideas for the new breakthrough strategy of tailor-made medical therapy is strongly required. For the establishment of such strategy, basic technologies that enable the detection and diagnosis of molecular dynamics should be investigated. In this class, we try to educate young researchers to step out to this new frontier by setting various types of classes held by very advanced researchers in medical engineering field in Nagoya University. The lecturers are invited from engineering faculty and medical faculty, and introduce the expected ideas and the most recent achievements in the aspect of medical engineering.

Prerequisite Subjects

Clinical medicine, Molecular biology, Biological engineering, Biomechanics, Robotics, Medical engineering, Bioinformatics

Course Topics

In every lecture, different lectures invited from different fields (engineer, doctors, etc.) teach the most recent advances in the field of medical engineering. The lecture is mostly presented by power point, and for some classes, handouts are provided.

Textbook

Not specified, but distributed handouts if necessary.

Additional Reading

It will be appointed if necessary.

Grade Assessment

Reports (80%) and interview (20%)

Notes

Not needed

Contacting Faculty

At lecture time

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	1 Spring and Autumn Semester
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
Lecturer	Hiroshi IKUTA 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

not specified.

Additional Reading

not specified.

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

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	1 Spring and Autumn Semester
Lecturer	Hiroshi IKUTA 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

not specified.

Additional Reading

not specified.

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

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	1 Spring and Autumn Semester
Lecturer	Hiroshi IKUTA 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

not specified.

Additional Reading

not specified.

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

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	1 Spring and Autumn Semester
Lecturer	Hiroshi IKUTA 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

not specified.

Additional Reading

not specified.

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

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	1 Spring and Autumn Semester
Lecturer	Hiroshi IKUTA 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

not specified.

Additional Reading

not specified.

Grade Assessment

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

Notes

Contacting Faculty

The questions will be answered by the direct supervisors as needed at the internship.

Laboratory Visit 1 U2 (2.0credits) (研究室ローテーション 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	Chemical Systems Engineering
	Electrical Engineering	Electronics	Information and Communication Engineering
	Mechanical Systems Engineering	Micro-Nano Mechanical Science and Engineering	Aerospace 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
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 review 2. Formulating the research plan 3. Analyzing the results and discussion 4. Presentation of the results After 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 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	Chemical Systems Engineering
	Electrical Engineering	Electronics	Information and Communication Engineering
	Mechanical Systems Engineering	Micro-Nano Mechanical Science and Engineering	Aerospace 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
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 review 2. Formulating the research plan 3. Analyzing the results and discussion 4. Presentation of the results After 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 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	Chemical Systems Engineering
	Electrical Engineering	Electronics	Information and Communication Engineering
	Mechanical Systems Engineering	Micro-Nano Mechanical Science and Engineering	Aerospace 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
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 review 2. Formulating the research plan 3. Analyzing the results and discussion 4. Presentation of the results After 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 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	Chemical Systems Engineering
	Electrical Engineering	Electronics	Information and Communication Engineering
	Mechanical Systems Engineering	Micro-Nano Mechanical Science and Engineering	Aerospace 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
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 review 2. Formulating the research plan 3. Analyzing the results and discussion 4. Presentation of the results After 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 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	Chemical Systems Engineering
	Electrical Engineering	Electronics	Information and Communication Engineering
	Mechanical Systems Engineering	Micro-Nano Mechanical Science and Engineering	Aerospace 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
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 review 2. Formulating the research plan 3. Analyzing the results and discussion 4. Presentation of the results After 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.

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	1 Spring and Autumn Semester
Lecturer	Hiroshi IKUTA 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

Teaching and Instruction Exercise 1 (1.0credits) (実験指導体験実習1)

documents that a lecturer (DP) introduces it and shows.

Additional Reading

documents that a lecturer (DP) introduces it and shows.

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

There are no prerequisites

Contacting Faculty

A lecturer (DP) and this 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	1 Spring and Autumn Semester
Lecturer	Syusaku NAGANO Associate Professor		

Course Purpose

The purpose of this course is to provide guidance to semester students for advanced science and engineering experiments at the Venture Business Laboratory. Through this research guidance, students will be able to play a comprehensive role as a researcher / educator and instructor in the field in charge of Raman spectroscopy, ionization potential measurement, X-ray diffraction measurement, and molecular simulation, and will be able to provide research guidance. Useful for practical training as a research leader.

Prerequisite Subjects

Knowledge of the field in charge selected from the fields of Raman spectroscopy, ionization potential measurement, X-ray diffraction measurement, and molecular simulation.

Course Topics

In the student experiment, the instructor students provide guidance to attendant students on subject research and original research from the field of Raman spectroscopy, ionization potential measurement, X-ray diffraction measurement, and molecular simulation with the professional teacher. Together with the attendant students, they perform practical use these equipment and software and get the results. They experience the leadership of the research, providing research guidance, report preparation guidance, and presentation guidance.

Textbook

Required documents is distributed.

Additional Reading

Teaching and Instruction Exercise 2 (1.0credits) (実験指導体験実習2)

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 understanding in one field from Raman spectroscopy, ionization potential measurement, X-ray diffraction measurement, and molecular simulation.

Contacting Faculty

Arranging the schedules by e-mail and etc.