

## Frontier in Civil Engineering (2.0credits) (土木工学のフロンティア)

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Course Type	Basic Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Spring Semester
Lecturer	Associated Faculty	

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### Course Purpose

The aim of the lecture is to comprehensively examine the framework of civil engineering through the introductions of various research topics, projects and so on which the staff of civil engineering have investigated in recent years.

After completing this course, students will be able to:

- 1.explain various recent issues in civil engineering fields, and
- 2.establish a comprehensive perspective in civil engineering.

### Prerequisite Subjects

As this is a cross-disciplinary course within the field of civil engineering, no background course is specified.

### Course Topics

1. Guidance
2. Frontier of Structural Engineering
3. Frontier of Material Engineering
4. Frontier of Coastal Engineering
5. Frontier of River Engineering
6. Frontier of Geotechnical Engineering
7. Frontier of Urban and Transportation Planning

A report must be submitted in each class.

### Textbook

No textbook is specified, but references will be introduced and lecture materials will be distributed as the lecture progresses.

### Additional Reading

To be introduced as necessary in the course of the lecture.

### Grade Assessment

All reports will be evaluated comprehensively, and the criteria for passing the course will be the ability to logically consider and explain various problems in the field of civil engineering based on the knowledge obtained through the lectures. If the student is able to handle more difficult issues, the grade will be reflected accordingly.

### Notes

No prerequisite

The class will be opened by the online-system (Teams, Zoom, or on-demand).

Out of class, students can ask questions by "message" function of NUCT.

the opinion exchange between students will be done by "message" function of NUCT.

### Contacting Faculty

Students are encouraged to ask questions in the class.

Students can ask the other question to the teacher by e-mail

Contact faculty

Kentaro NAKAI (nakai@civil.nagoya-u.ac.jp)

Course Type	Basic Courses
Division at course	Master's Course
Class Format	Lecture
Course Name	Civil and Environmental Engineering
Starts 1	1 Spring Semester
Lecturer	Associated Faculty

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### Course Purpose

The aim of the lecture is to comprehensively examine the framework of civil engineering through the introductions of various projects and so on which the engineers working in the frontier of civil engineering fields.

After completing this course, students will be able to:

- 1.explain planning, design, construction and maintenance of infrastructure in Japan, as well as overseas, and
- 2.explain various issues in civil engineering fields.

### Prerequisite Subjects

As this is a cross-disciplinary course within the field of civil engineering, no background course is specified.

### Course Topics

1. Guidance
2. Lectures by seven outside lecturers
3. Q&A session organized by students in each lecture

A report must be submitted in each class.

### Textbook

Textbooks will be recommended at the right time.

### Additional Reading

Reference books will be recommended at the right time.

### Grade Assessment

All reports and contribution to discussion will be evaluated comprehensively, and the criteria for passing the course will be the ability to logically consider and explain various problems in the field of civil engineering based on the knowledge obtained through the lectures. If the student is able to handle more difficult issues, the grade will be reflected accordingly.

### Notes

No prerequisite

This class will be held face-to-face.

If this class will be held by remote teaching, the online-system (Teams, Zoom, or on-demand) will be used. students will be able to ask questions by "message" function of NUCT. the opinion exchange between students will be done by "message" function of NUCT.

### Contacting Faculty

Students are encouraged to ask questions in the class.

Out of class, students can ask questions by "message" function of NUCT.

Contact faculty

Kentaro NAKAI (nakai@civil.nagoya-u.ac.jp)

## Project in Civil Engineering B (2.0credits) (土木工学総合プロジェクトB)

Course Type	Basic Courses
Division at course	Master's Course
Class Format	Lecture
Course Name	Civil and Environmental Engineering
Starts 1	1 Autumn Semester
Lecturer	Associated Faculty

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### Course Purpose

The aim of the lecture is to comprehensively examine the framework of civil engineering through investigating certain problems and proposing countermeasures in civil engineering fields.

After completing this course, students will be able to:

- 1.explain various issues in civil engineering fields in Japan, as well as overseas, and
- 2.acquire a comprehensive methodology for executing projects in infrastructure development.

### Prerequisite Subjects

Frontier in Civil Engineering  
Project in Civil Engineering A

### Course Topics

Students are divided into several working groups. Each group will select a certain problem related to civil infrastructure, investigate the problem, and propose countermeasures.

1. Guidance
2. Presentation from all students
3. Discussion in each working group
4. Presentation from each working group, discussion
5. Evaluation of proposals from each working group, discussion
6. Final presentation from each working group, discussion

An answer to homework must be submitted in each class.

### Textbook

Textbooks will be recommended at the right time.

### Additional Reading

Reference books will be recommended at the right time.

### Grade Assessment

All reports, oral presentation and contribution to discussion will be evaluated comprehensively, and the criteria for passing the course will be the ability to logically consider and explain various problems in the field of civil engineering based on the knowledge obtained through the lectures. If the student is able to handle more difficult issues, the grade will be reflected accordingly.

### Notes

No prerequisite

### Contacting Faculty

Students are encouraged to ask questions in the class.

Course Type	Basic Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	Autumn Semester ,every other year	2 Autumn Semester
Lecturer	Kiichiro HAYASHI Professor	Miho IRYO(ASANO) Associate Professor

### Course Purpose

The objective of this lecture is to learn the basic academic knowledge and the ability to solve the issues related to civil and environmental engineering for social infrastructure development in developing countries.

The goal of this lecture is that the students will understand the basics and applied skills of analysis methods of the issues related to sustainable development, environmental management and international cooperation in developing countries and then learn the comprehensive way of thinking to tackle of the issues

### Prerequisite Subjects

Civil Engineering and Policies for Developing Countries II

### Course Topics

- 1.Development
- 2.Development and agriculture
- 3.Development and industrialization
- 4.Sustainable development
- 5.MDGs and SDGs
- 6.Environment and resource issues in developing countries
- 7.International environmental management(international treaty, international organization)
- 8.International cooperation

To review the contents of the lecture to understand specialized topics.

### Textbook

Documents will be provided at the lecture if needed. And some references will be provided if needed.

### Additional Reading

It will be assigned in the class if necessary.

### Grade Assessment

Evaluation is based on essay exam (20%) and final examination (80%).

The C grade is the minimum requirement for passing this lecture.

The success criteria is to understand the basics and applied skills of analysis methods of the issues related to sustainable development, environmental management and international cooperation in developing countries.

It employs the course registration withdrawal system.

### Notes

no requirement

The lecture will be provided by on-line tool (such as teams). However there is a plan to visit an organization located outside of the campus. Some of the slot will be conducted by using two slots, namely, the third and fourth lecture time slots. The detailed will be presented at the first day of the guidance.

Question will be accepted in the class and after class. A discussion time will be provided in some slots of this class.

### Contacting Faculty

In the class and/or by e-mail.

e-mail: maruhaya98--(at)imass.nagoya-u.ac.jp

Course Type	Basic Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	Autumn Semester ,every other year	1 Autumn Semester
Lecturer	Associated Faculty	

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### Course Purpose

The objectives of this course are (1) to study the fundamental knowledge on planning, design, construction and maintenance of infrastructure in Japan, as well as developing countries; (2) to survey various issues in civil engineering, including the environmental problems and recent development of regional disaster mitigation activities.

After completing this course, students will be able to:

- 1.explain planning, design, construction and maintenance of infrastructure in Japan, as well as developing countries, and
- 2.explain various issues in civil engineering fields.

### Prerequisite Subjects

As this is a cross-disciplinary course within the field of civil engineering, no background course is specified.

### Course Topics

1. Introduction to disaster risk assessment
2. Water resources and river basin management
3. Coastal zone management
4. Infrastructure development under aid programs
5. Infrastructure projects in developing countries

A report for each lecture must be submitted at the following class.

### Textbook

No textbook is specified, but references will be introduced and lecture materials will be distributed as the lecture progresses.

### Additional Reading

To be introduced as necessary in the course of the lecture.

### Grade Assessment

All reports will be evaluated comprehensively, and the criteria for passing the course will be the ability to logically consider and explain various problems in infrastructure development in Japan and developing countries, based on the knowledge gained through the lectures. If the student is able to handle more difficult problems, the grade will be reflected accordingly.

### Notes

No course requirements are specified.

### Contacting Faculty

Students are encouraged to ask questions in the class.

Course Type	Basic Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Spring Semester
Lecturer	Miho IRYO(ASANO) Associate Professor	CHUN Sohyun Lecturer

### Course Purpose

International communication skills are indispensable to propose policies that address environmental issues in the international communities. This lecture aims to improve international communication skills through analysis, policy proposals and discussions on environmental issues.

The objective of this lecture is to acquire the following knowledge and skills.

1. Understand and apply effective presentation and discussion techniques in English.
2. Understand the environmental issues in various countries and the differences in how environmental issues are perceived by different standpoints.
3. Based on opinions from other perspectives, they can explain their points logically and persuade others.

### Prerequisite Subjects

Not specified because the class intends to learn how to discuss with people with a diverse background.

### Course Topics

1. Presentation and discussion method

Students learn how to structure presentations, create slides, and discuss in order to effectively convey their opinions to others.

2. Group discussion and presentation on environmental issues in home country

Explain environmental issues in their home countries, summarize common issues and areas of interest in each country, and give presentations.

3. Group discussion and role play on environmental issues and consensus building

To resolve environmental issues, it is necessary to build consensus among various stakeholders. In this part students will make a role-play to understand opinions from different positions and consensus building processes.

4. Group debate

Make a debate on a given topic related to environmental issues.

5. Discussion and presentation on environmental issues of interest for each group

Discuss environmental issues which students got interest through above classes and propose countermeasures.

All classes will be conducted in English. At the end of each class, an outline of the next class will be given. Based on the outline, students are required to collect necessary materials and prepare for discussion before the class.

### Textbook

Handouts will be distributed at each class.

### Additional Reading

Reference literature will be introduced as needed.

### Grade Assessment

Evaluation is based on contribution to group discussions (40%), presentation skills at group presentation, role play and debate (40%), and report related to the contents of the discussion (20%). The evaluation will be made with the rubric distributed in the first class.

Students will pass if they will be able to explain their arguments logically and clearly, and to discuss environmental issues from multiple perspectives.

## English Communication in Environmental Issues (2.0credits) (環境コミュニケーション)

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Attendance of more than 80% lectures is necessary to have credits.

### Notes

No course conditions are imposed.

This course will be held by combination of online (using Teams or Zoom in real time) and on-site classes. If there are any changes, the information will be announced via NUCT.

### Contacting Faculty

If you have any questions, please ask the instructor by e-mail (iryoy(at)nagoya-u.jp) or make an appointment by e-mail before coming to the room.



## Sustainability and Environmental Studies (2.0credits) (持続可能性と環境学)

Course Type	Basic Courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	1 Autumn Semester	1 Autumn Semester	
Lecturer	Hiroki tanikawa Professor	Miho IRYO(ASANO) Associate Professor	AnatolyZINCENKO Associate Professor

### Course Purpose

This course aims to deepen the understanding about "sustainable development", which is one of the central concepts in the environmental studies, through lectures highlighting activities and approaches in various fields.

The objective of this course is to acquire the following knowledge and skills.

1. Understand and be able to explain the concept of "Sustainability" in context of environmental studies from three perspectives: 1) Society and/or social sciences, 2) Observation and analysis by natural sciences, and 3) Urban and spatial perspective.
2. Be able to explain "Sustainability" using the concept of "Safety".

### Prerequisite Subjects

Sustainable City Studies, etc.

### Course Topics

The lectures are to be given by several lecturers that may include external guest speakers. Sustainability covers broad areas. It is therefore inevitable that the course consists of various topics.

### Contents

1. Orientation
2. Lectures given by lectures from various fields
  - 1) Sustainable Development and Disaster Risk Reduction
  - 2) How can we adapt to water-related disaster?
  - 3) Global Change Monitoring by Remote Sensing
  - 4) Natural Disasters and the Society
  - 5) Sustainable Transport Systems
  - 6) Road Traffic System for the Sustainable Society
  - 7) Toward Environmentally Sustainable Transport (EST)
  - 8) Sustainable Material Use and Low-carbonization Society
  - 9) Green Chemistry and Sustainability
3. Wrap-Up Discussion

### Textbook

No textbook is used, but handouts will be distributed for each class.

### Additional Reading

Reference materials will be introduced during each lecture.

### Grade Assessment

Evaluation is carried out based on assignments (50%) and final report (50%). Credits will not be given to those with lower than 70% attendance of lectures.

### Notes

No specific requirements.

The class will be conducted as a remote class (interactive communication class)

\* If there is a change in the class format, students will be notified by the NUCT class site.

#### Contacting Faculty

Question regarding the class can be asked using the "message" function of NUCT.

Communication between students regarding class is possible using the "message" function of NUCT.

In case of any problems with NUCT, contact the coordinator Anatoly Zinchenko  
(zinchenko@urban.env.nagoya-u.ac.jp)

## Seminar on Structural Engineering 1A (2.0credits) (構造工学セミナー1A)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	1 Spring Semester	1 Autumn Semester	
Lecturer	Junji KATO Professor	NISHIGUCHI Koji Lecturer	Hiroya HOSHIBA Assistant Professor

### Course Purpose

To understand basic theory of finite element method and continuum mechanics.

Performance targets:

- 1) To understand finite element analysis and to be able to make the source code by yourself
- 2) To understand nonlinear finite element analysis and to be able to make the source code by yourself

### Prerequisite Subjects

Computational Mechanics, Structural Mechanics, Applied Structural Mechanics, Strengths of Structures in Ultimate States, etc.

### Course Topics

#### 1. Finite Element Method

- Basic concept of principle of virtual work
- Discretization method
- Newton-Raphson method
- Nonlinear structural analysis and its solution method

Several reports will be given in the class.

### Textbook

Finite Element Procedures (K.J. Bathe) and handout will be given.

### Additional Reading

Reference books are introduced at the first lecture.

### Grade Assessment

Required to understand the basic knowledge of continuum mechanics and finite element method.

The goal attainment level is evaluated by both results of attendance and attitude of learning in this class.

60 points or more are accepted for 100 full marks.

### Notes

No special requirement is necessary.

Class embodiments and tools used: The seminar is interactive online class using Zoom.

### Contacting Faculty

Questions are welcome during the seminar.

The lecturer in charge

Lecturer: Koji Nishiguchi

[https://profs.provost.nagoya-u.ac.jp/html/100011123\\_en.html](https://profs.provost.nagoya-u.ac.jp/html/100011123_en.html)

## Seminar on Structural Engineering 1B (2.0credits) (構造工学セミナー1B)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	1 Autumn Semester	1 Spring Semester	
Lecturer	Junji KATO Professor	NISHIGUCHI Koji Lecturer	Hiroya HOSHIBA Assistant Professor

### Course Purpose

To understand basic theory of finite element method and continuum mechanics.

Performance targets:

- 1) To understand finite element analysis and to be able to make the source code by yourself
- 2) To understand nonlinear finite element analysis and to be able to make the source code by yourself

### Prerequisite Subjects

Computational Mechanics, Structural Mechanics, Applied Structural Mechanics, Strengths of Structures in Ultimate States, etc.

### Course Topics

#### 1. Finite Element Method

- Basic concept of principle of virtual work
- Discretization method
- Newton-Raphson method
- Nonlinear structural analysis and its solution method

Several reports will be given in the class.

### Textbook

Finite Element Procedures (K.J. Bathe) and handout will be given.

### Additional Reading

Reference books are introduced at the first lecture.

### Grade Assessment

Required to understand the basic knowledge of continuum mechanics and finite element method.

The goal attainment level is evaluated by both results of attendance and attitude of learning in this class.

60 points or more are accepted for 100 full marks

### Notes

No special requirement is necessary.

Class embodiments and tools used: The seminar is interactive online class using Zoom.

### Contacting Faculty

Questions are welcome during the the seminar.

The lecturer in charge

Lecturer: Koji Nishiguchi

[https://profs.provost.nagoya-u.ac.jp/html/100011123\\_en.html](https://profs.provost.nagoya-u.ac.jp/html/100011123_en.html)

## Seminar on Structural Engineering 1C (2.0credits) (構造工学セミナー1C)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	2 Spring Semester	2 Autumn Semester	
Lecturer	Junji KATO Professor	NISHIGUCHI Koji Lecturer	Hiroya HOSHIBA Assistant Professor

### Course Purpose

To understand basic theory of finite element method and continuum mechanics.

Performance targets:

- 1) To understand finite element analysis and to be able to make the source code by yourself
- 2) To understand nonlinear finite element analysis and to be able to make the source code by yourself

### Prerequisite Subjects

Computational Mechanics, Structural Mechanics, Applied Structural Mechanics, Strengths of Structures in Ultimate States, etc.

### Course Topics

#### 1. Finite Element Method

- Basic concept of principle of virtual work
- Discretization method
- Newton-Raphson method
- Nonlinear structural analysis and its solution method

Several reports will be given in the class.

### Textbook

Finite Element Procedures (K.J. Bathe) and handout will be given.

### Additional Reading

Reference books are introduced at the first lecture.

### Grade Assessment

Required to understand the basic knowledge of continuum mechanics and finite element method.

The goal attainment level is evaluated by both results of attendance and attitude of learning in this class.

60 points or more are accepted for 100 full marks

### Notes

No special requirement is necessary.

Class embodiments and tools used: The seminar is interactive online class using Zoom.

### Contacting Faculty

Questions are welcome during the seminar.

The lecturer in charge

Lecturer: Koji Nishiguchi

[https://profs.provost.nagoya-u.ac.jp/html/100011123\\_en.html](https://profs.provost.nagoya-u.ac.jp/html/100011123_en.html)

## Seminar on Structural Engineering 1D (2.0credits) (構造工学セミナー1D)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	2 Autumn Semester	2 Spring Semester	
Lecturer	Junji KATO Professor	NISHIGUCHI Koji Lecturer	Hiroya HOSHIBA Assistant Professor

### Course Purpose

To understand basic theory of finite element method and continuum mechanics.

Performance targets:

- 1) To understand finite element analysis and to be able to make the source code by yourself
- 2) To understand nonlinear finite element analysis and to be able to make the source code by yourself

### Prerequisite Subjects

Computational Mechanics, Structural Mechanics, Applied Structural Mechanics, Strengths of Structures in Ultimate States, etc.

### Course Topics

#### 1. Finite Element Method

- Basic concept of principle of virtual work
- Discretization method
- Newton-Raphson method
- Nonlinear structural analysis and its solution method

Several reports will be given in the class.

### Textbook

Finite Element Procedures (K.J. Bathe) and handout will be given.

### Additional Reading

Reference books are introduced at the first lecture.

### Grade Assessment

Required to understand the basic knowledge of continuum mechanics and finite element method.

The goal attainment level is evaluated by both results of attendance and attitude of learning in this class.

60 points or more are accepted for 100 full marks

### Notes

No special requirement is necessary.

Class embodiments and tools used: The seminar is interactive online class using Zoom.

### Contacting Faculty

Questions are welcome during the seminar.

The lecturer in charge

Lecturer: Koji Nishiguchi

[https://profs.provost.nagoya-u.ac.jp/html/100011123\\_en.html](https://profs.provost.nagoya-u.ac.jp/html/100011123_en.html)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Autumn Semester
Lecturer	Hikaru NAKAMURA Professor	Taito Miura Associate Professor

### Course Purpose

The purpose of these practices is to acquire basic and applied knowledge for understanding the properties of cement, cement paste and concrete and the mechanisms of cement hydration using text book written in English. Furthermore, the participants would be able to get into the total power such as gathering information, relevant technique investigation and presentation skills as going through the presentation.

After completing this class, students will be able to:

1. Explain basic knowledge of cement chemistry
2. Literature survey of cement chemistry

### Prerequisite Subjects

Advanced Concrete Structure, Advanced Course in Lifecycle Design of Civil Structures, Exercise in Inspection of Civil Structures

### Course Topics

1. Property of Cement  
Type of cement  
Crystal structure of cement
2. Property of Cement paste  
Hydration process of each cement type  
Micro-structure of cement hydrates

Before class, please prepare next class and literature survey to related part. After class, please confirm related literature.

### Textbook

Cement Chemistry 2nd edition H.F.W. Taylor, Thomas Telford

### Additional Reading

Reference books will be recommended at the right time

### Grade Assessment

Considering the results of presentations and Oral examinations, the student who can understand and explain the fundamental knowledge of cement chemistry will be accepted. If the student can understand and explain further highly professional knowledge, the score will be reflected with accompanying the knowledge.

### Notes

\*There is no requirement of the course.

\*This lecture is planning to consist of online (Zoom) and face to face lectures. The detail information and schedule will be informed through NUCT.

Students who have a question on this class can contact to Taito Miura (t.miura(at)civil.nagoya-u.ac.jp).

### Contacting Faculty

Welcome to come to room directly anytime and question by e-mail t.miura(at)civil.nagoya-u.ac.jp

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Autumn Semester	1 Spring Semester
Lecturer	Hikaru NAKAMURA Professor	Taito Miura Associate Professor

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Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Spring Semester	2 Autumn Semester
Lecturer	Hikaru NAKAMURA Professor	Taito Miura Associate Professor

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Division at course	Master's Course	
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Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Autumn Semester	2 Spring Semester
Lecturer	Hikaru NAKAMURA Professor	Taito Miura Associate Professor

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### Contacting Faculty

Welcome to come to room directly anytime and question by e-mail t.miura(at)civil.nagoya-u.ac.jp

## Seminar on Conservation Engineering of River Basins 1A (2.0credits) (流域保全学セミナー1A)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Autumn Semester
Lecturer	Yuji Toda Professor	Ryota TSUBAKI Associate Professor

### Course Purpose

Basic and advanced research on fluvial hydraulics and hydrology and its relation to the ecosystem will be reviewed and discussed. Research methods will also be reviewed and discussed.

The objective of this course is to acquire the skills to understand the trends in research on conservation engineering of river basins and the methods to conduct hydraulics, hydrological and ecosystem researches.

### Prerequisite Subjects

Hydrology and River Engineering, Open-channel hydraulics, Fundamental of Hydrodynamics with Exercises, Human activities and environment

### Course Topics

1. Paper reviewing method
2. Fluvial hydraulics and hydrology and its relation to the ecosystem
3. Measurement and modeling of river morphology and hydraulics
4. Measurements for ecosystem

Documents and experiment preparation is required prior to the seminar. Data analysis and report submission are asked following the seminar.

### Textbook

Directed as needed

### Additional Reading

Directed as needed

### Grade Assessment

Presentation and report will be used for grading. To acquire basic skills of research review or fundamental methods for research is the criteria to pass. Advanced skills for reviewing and research will be accounted for the grade.

### Notes

No course requirements are specified.

- The class will be given by physical lecture or online in the on-demand format and/or the real-time format using Teams/Zoom (will be determined based on the participants' capability). Details will be announced on NUCT.

- If you have any questions, please contact to the lecturer via e-mail or "Messages" of NUCT.

- If you want to exchange information among students, please use "Message" of NUCT.

### Contacting Faculty

Discuss during the seminar or asking by e-mail.

## Seminar on Conservation Engineering of River Basins 1B (2.0credits) (流域保全学セミナー1B)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Autumn Semester	1 Spring Semester
Lecturer	Yuji Toda Professor	Ryota TSUBAKI Associate Professor

### Course Purpose

Basic and advanced research on fluvial hydraulics and hydrology and its relation to the ecosystem will be reviewed and discussed. Research methods will also be reviewed and discussed.

The objective of this course is to acquire the skills to understand the trends in research on conservation engineering of river basins and the methods to conduct hydraulics, hydrological and ecosystem researches.

### Prerequisite Subjects

Hydrology and River Engineering, Open-channel hydraulics, Fundamental of Hydrodynamics with Exercises, Human activities and environment

### Course Topics

1. Paper reviewing method
2. Fluvial hydraulics and hydrology and its relation to the ecosystem
3. Measurement and modeling of river morphology and hydraulics
4. Measurements for ecosystem

Documents and experiment preparation is required prior to the seminar. Data analysis and report submission are asked following the seminar.

### Textbook

Directed as needed

### Additional Reading

Directed as needed

### Grade Assessment

Presentation and report will be used for grading. To acquire basic skills of research review or fundamental methods for research is the criteria to pass. Advanced skills for reviewing and research will be accounted for the grade.

### Notes

No course requirements are specified.

- The class will be given by physical lecture or online in the on-demand format and/or the real-time format using Teams/Zoom (will be determined based on the participants' capability). Details will be announced on NUCT.

- If you have any questions, please contact to the lecturer via e-mail or "Messages" of NUCT.

- If you want to exchange information among students, please use "Message" of NUCT.

### Contacting Faculty

Discuss during the seminar or asking by e-mail.

## Seminar on Conservation Engineering of River Basins 1C (2.0credits) (流域保全学セミナー1C)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Spring Semester	2 Autumn Semester
Lecturer	Yuji Toda Professor	Ryota TSUBAKI Associate Professor

### Course Purpose

Basic and advanced research on fluvial hydraulics and hydrology and its relation to the ecosystem will be reviewed and discussed. Research methods will also be reviewed and discussed.

The objective of this course is to acquire the skills to understand the trends in research on conservation engineering of river basins and the methods to conduct hydraulics, hydrological and ecosystem researches.

### Prerequisite Subjects

Hydrology and River Engineering, Open-channel hydraulics, Fundamental of Hydrodynamics with Exercises, Human activities and environment

### Course Topics

1. Paper reviewing method
2. Fluvial hydraulics and hydrology and its relation to the ecosystem
3. Measurement and modeling of river morphology and hydraulics
4. Measurements for ecosystem

Documents and experiment preparation is required prior to the seminar. Data analysis and report submission are asked following the seminar.

### Textbook

Directed as needed

### Additional Reading

Directed as needed

### Grade Assessment

Presentation and report will be used for grading. To acquire basic skills of research review or fundamental methods for research is the criteria to pass. Advanced skills for reviewing and research will be accounted for the grade.

### Notes

No course requirements are specified.

- The class will be given by physical lecture or online in the on-demand format and/or the real-time format using Teams/Zoom (will be determined based on the participants' capability). Details will be announced on NUCT.

- If you have any questions, please contact to the lecturer via e-mail or "Messages" of NUCT.

- If you want to exchange information among students, please use "Message" of NUCT.

### Contacting Faculty

Discuss during the seminar or asking by e-mail.

## Seminar on Conservation Engineering of River Basins 1D (2.0credits) (流域保全学セミナー1D)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Autumn Semester	2 Spring Semester
Lecturer	Yuji Toda Professor	Ryota TSUBAKI Associate Professor

### Course Purpose

Basic and advanced research on fluvial hydraulics and hydrology and its relation to the ecosystem will be reviewed and discussed. Research methods will also be reviewed and discussed.

The objective of this course is to acquire the skills to understand the trends in research on conservation engineering of river basins and the methods to conduct hydraulics, hydrological and ecosystem researches.

### Prerequisite Subjects

Hydrology and River Engineering, Open-channel hydraulics, Fundamental of Hydrodynamics with Exercises, Human activities and environment

### Course Topics

1. Paper reviewing method
2. Fluvial hydraulics and hydrology and its relation to the ecosystem
3. Measurement and modeling of river morphology and hydraulics
4. Measurements for ecosystem

Documents and experiment preparation is required prior to the seminar. Data analysis and report submission are asked following the seminar.

### Textbook

Directed as needed

### Additional Reading

Directed as needed

### Grade Assessment

Presentation and report will be used for grading. To acquire basic skills of research review or fundamental methods for research is the criteria to pass. Advanced skills for reviewing and research will be accounted for the grade.

### Notes

No course requirements are specified.

- The class will be given by physical lecture or online in the on-demand format and/or the real-time format using Teams/Zoom (will be determined based on the participants' capability). Details will be announced on NUCT.

- If you have any questions, please contact to the lecturer via e-mail or "Messages" of NUCT.

- If you want to exchange information among students, please use "Message" of NUCT.

### Contacting Faculty

Discuss during the seminar or asking by e-mail.

## Seminar on Coastal and Maritime Engineering 1A (2.0credits) (海岸・海洋工学セミナー1A)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	1 Spring Semester	1 Autumn Semester	
Lecturer	norimi mizutani Professor	Tomoaki NAKAMURA Associate Professor	YonghwanCHO Assistant Professor

### Course Purpose

The aim of this course is to review and discuss refereed journal papers in order to understand physical processes on coastal and ocean engineering.

Course objectives:

Students will be able to

1. explain what theoretical, experimental, and numerical methods used in coastal and ocean engineering are
2. understand state-of-the-art research in coastal and ocean engineering

### Prerequisite Subjects

Advanced Fluvial and Coastal Hydrodynamics, Advanced Coastal and Offshore Engineering, Advanced Work in Coastal and Offshore Engineering

### Course Topics

Presentation and discussion on a refereed journal paper on coastal and ocean engineering

Students are required to read and understand a journal paper before the lecture, and prepare presentation materials summarizing the paper.

After the lecture, students are required to summarize answers to questions and review the contents of the paper.

### Textbook

Students will select refereed journal papers closely related to their research topic

### Additional Reading

Directed as needed

### Grade Assessment

Your final grade will be calculated according to the presentation and discussion. To pass, students must understand the basics of the selected journal papers on coastal and ocean engineering.

### Notes

No prerequisite

- The class will be given in the real-time online format using Teams and Slack.

### Contacting Faculty

Norimi Mizutani (ext. 4630, mizutani@civil.nagoya-u.ac.jp), Tomoaki Nakamura (ext. 4632, tnakamura@nagoya-u.jp), Yong-Hwan Cho (ext. 4634, yhcho@civil.nagoya-u.ac.jp)

## Seminar on Coastal and Maritime Engineering 1B (2.0credits) (海岸・海洋工学セミナー1B)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	1 Autumn Semester	1 Spring Semester	
Lecturer	norimi mizutani Professor	Tomoaki NAKAMURA Associate Professor	YonghwanCHO Assistant Professor

### Course Purpose

The aim of this course is to review and discuss refereed journal papers in order to understand physical processes on coastal and ocean engineering.

Course objectives:

Students will be able to

1. explain what theoretical, experimental, and numerical methods used in coastal and ocean engineering are
2. understand state-of-the-art research in coastal and ocean engineering

### Prerequisite Subjects

Advanced Fluvial and Coastal Hydrodynamics, Advanced Coastal and Offshore Engineering, Advanced Work in Coastal and Offshore Engineering

### Course Topics

Presentation and discussion on a refereed journal paper on coastal and ocean engineering

Students are required to read and understand a journal paper before the lecture, and prepare presentation materials summarizing the paper.

After the lecture, students are required to summarize answers to questions and review the contents of the paper.

### Textbook

Students will select refereed journal papers closely related to their research topic

### Additional Reading

Directed as needed

### Grade Assessment

Your final grade will be calculated according to the presentation and discussion. To pass, students must understand the basics of the selected journal papers on coastal and ocean engineering.

### Notes

No prerequisite

- The class will be given in the real-time online format using Teams and Slack.

### Contacting Faculty

Norimi Mizutani (ext. 4630, mizutani@civil.nagoya-u.ac.jp), Tomoaki Nakamura (ext. 4632, tnakamura@nagoya-u.jp), Yong-Hwan Cho (ext. 4634, yhcho@civil.nagoya-u.ac.jp)



## Seminar on Coastal and Maritime Engineering 1C (2.0credits) (海岸・海洋工学セミナー1C)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	2 Spring Semester	2 Autumn Semester	
Lecturer	norimi mizutani Professor	Tomoaki NAKAMURA Associate Professor	YonghwanCHO Assistant Professor

### Course Purpose

The aim of this course is to review and discuss refereed journal papers in order to understand physical processes on coastal and ocean engineering.

Course objectives:

Students will be able to

1. explain what theoretical, experimental, and numerical methods used in coastal and ocean engineering are
2. understand state-of-the-art research in coastal and ocean engineering

### Prerequisite Subjects

Advanced Fluvial and Coastal Hydrodynamics, Advanced Coastal and Offshore Engineering, Advanced Work in Coastal and Offshore Engineering

### Course Topics

Presentation and discussion on a refereed journal paper on coastal and ocean engineering

Students are required to read and understand a journal paper before the lecture, and prepare presentation materials summarizing the paper.

After the lecture, students are required to summarize answers to questions and review the contents of the paper.

### Textbook

Students will select refereed journal papers closely related to their research topic

### Additional Reading

Directed as needed

### Grade Assessment

Your final grade will be calculated according to the presentation and discussion. To pass, students must understand the basics of the selected journal papers on coastal and ocean engineering.

### Notes

No prerequisite

- The class will be given in the real-time online format using Teams and Slack.

### Contacting Faculty

Norimi Mizutani (ext. 4630, mizutani@civil.nagoya-u.ac.jp), Tomoaki Nakamura (ext. 4632, tnakamura@nagoya-u.jp), Yong-Hwan Cho (ext. 4634, yhcho@civil.nagoya-u.ac.jp)

## Seminar on Coastal and Maritime Engineering 1D (2.0credits) (海岸・海洋工学セミナー1D)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	2 Autumn Semester	2 Spring Semester	
Lecturer	norimi mizutani Professor	Tomoaki NAKAMURA Associate Professor	YonghwanCHO Assistant Professor

### Course Purpose

The aim of this course is to review and discuss refereed journal papers in order to understand physical processes on coastal and ocean engineering.

Course objectives:

Students will be able to

1. explain what theoretical, experimental, and numerical methods used in coastal and ocean engineering are
2. understand state-of-the-art research in coastal and ocean engineering

### Prerequisite Subjects

Advanced Fluvial and Coastal Hydrodynamics, Advanced Coastal and Offshore Engineering, Advanced Work in Coastal and Offshore Engineering

### Course Topics

Presentation and discussion on a refereed journal paper on coastal and ocean engineering

Students are required to read and understand a journal paper before the lecture, and prepare presentation materials summarizing the paper.

After the lecture, students are required to summarize answers to questions and review the contents of the paper.

### Textbook

Students will select refereed journal papers closely related to their research topic

### Additional Reading

Directed as needed

### Grade Assessment

Your final grade will be calculated according to the presentation and discussion. To pass, students must understand the basics of the selected journal papers on coastal and ocean engineering.

### Notes

No prerequisite

- The class will be given in the real-time online format using Teams and Slack.

### Contacting Faculty

Norimi Mizutani (ext. 4630, mizutani@civil.nagoya-u.ac.jp), Tomoaki Nakamura (ext. 4632, tnakamura@nagoya-u.jp), Yong-Hwan Cho (ext. 4634, yhcho@civil.nagoya-u.ac.jp)

## Seminar on Geomaterial Engineering1A (2.0credits) (地盤材料工学セミナー1A)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Autumn Semester
Lecturer	Masaki NAKANO Professor	SAKAITakayuki Assistant Professor

### Course Purpose

This course introduces the latest knowledge of geotechnical engineering and geotechnical material engineering in order to acquire knowledge of advanced specialized fields based on engineering basics and related boundary areas with the aim of training comprehensive and applied skills, problem excavation and solution skills. The aim of this course is to understand research trends, related research areas, and social trends, to discuss measures for extracting and solving issues, and to understand the relationship with basic science as well as to acquire the reading comprehension skills and presentation skills necessary for conducting and developing research. The aim of this course is to understand research trends, related research areas, and social trends, to discuss measures for extracting and solving issues, and to understand the relationship with basic science as well as to acquire the reading comprehension skills and presentation skills necessary for conducting and developing research.

The goals of this course are to

- (1) Understand and explain theoretical, experimental, and numerical research methods in geotechnical engineering and geotechnical material engineering.
- (2) Understand domestic and overseas research trends in related fields.

### Prerequisite Subjects

Advanced Geotechnical Engineering, Advanced Mechanics of Geomaterials, Advanced Soil Dynamics, Advanced Continuum Mechanics, Advanced Numerical Analysis, Advanced Work in Soil Mechanics and Geotechnical Engineering

### Course Topics

1. Mechanical behavior of basic materials used in soil mechanics and geotechnical engineering  
Learning mainly about the mechanical behavior of typical sand, clay, and intermediate soils, and the description using elastoplastic constitutive models
2. Mechanical behavior of special soil and problematic soil  
Understanding and modeling the mechanical behavior of soil materials having weathering, expansive, and friable properties.
3. Effective use of generated soil and disaster waste  
Measurement to make effective usage of construction waste soil and recovered soil from disaster waste as soil material
4. Features of overseas earth materials  
Understanding the characteristics of soil generated during construction overseas and soil materials causing geological disasters.
5. Ground material improvement technology  
Understanding techniques for strengthening and stabilizing difficult-to-handle ground materials with solidified materials and short discrete fibers.

You must prepare and review materials/handouts used in seminar. In addition, you will be required to submit several report assignments, so submit them.

### Textbook

The related papers will be selected and distributed as appropriate as the seminar progresses.

### Additional Reading

References will be introduced as necessary.

### Grade Assessment

The degree of achievement of goals is comprehensively evaluated by making presentations at seminar, answering questions, contributing to discussions, and reporting on issues. The contributions are those that answer the questions and those that summarize the contents of the literature. Acceptance criteria are to be able to logically consider and discuss based on the knowledge obtained through the class, such as the extraction and resolution of various problems in geomaterials engineering.

### Notes

No course requirements are required.

Lecture is held by ONLINE by using Zoom or Teams.

Ask questions to lecturer using E-mail.

Exchange opinions between students regarding the class using the NUCT function "Message".

### Contacting Faculty

Welcome questions during and after this seminar. Each member also accepts questions at the room and by e-mail at any time.

Masaki NAKANO: Ex.4622, nakano (at) civil.nagoya-u.ac.jp

Takayuki Sakai: Ex.2734t-sakai (at) civil.nagoya-u.ac.jp

Please replace (at) with @.

## Seminar on Geomaterial Engineering1B (2.0credits) (地盤材料工学セミナー1B)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Autumn Semester	1 Spring Semester
Lecturer	Masaki NAKANO Professor	SAKAITakayuki Assistant Professor

### Course Purpose

This course introduces the latest knowledge of geotechnical engineering and geotechnical material engineering in order to acquire knowledge of advanced specialized fields based on engineering basics and related boundary areas with the aim of training comprehensive and applied skills, problem excavation and solution skills. The aim of this course is to understand research trends, related research areas, and social trends, to discuss measures for extracting and solving issues, and to understand the relationship with basic science as well as to acquire the reading comprehension skills and presentation skills necessary for conducting and developing research. The aim of this course is to understand research trends, related research areas, and social trends, to discuss measures for extracting and solving issues, and to understand the relationship with basic science as well as to acquire the reading comprehension skills and presentation skills necessary for conducting and developing research.

The goals of this course are to

- (1) Understand and explain theoretical, experimental, and numerical research methods in geotechnical engineering and geotechnical material engineering.
- (2) Understand domestic and overseas research trends in related fields.

### Prerequisite Subjects

Advanced Geotechnical Engineering, Advanced Mechanics of Geomaterials, Advanced Soil Dynamics, Advanced Continuum Mechanics, Advanced Numerical Analysis, Advanced Work in Soil Mechanics and Geotechnical Engineering

### Course Topics

1. Mechanical behavior of basic materials used in soil mechanics and geotechnical engineering  
Learning mainly about the mechanical behavior of typical sand, clay, and intermediate soils, and the description using elastoplastic constitutive models
2. Mechanical behavior of special soil and problematic soil  
Understanding and modeling the mechanical behavior of soil materials having weathering, expansive, and friable properties.
3. Effective use of generated soil and disaster waste  
Measurement to make effective usage of construction waste soil and recovered soil from disaster waste as soil material
4. Features of overseas earth materials  
Understanding the characteristics of soil generated during construction overseas and soil materials causing geological disasters.
5. Ground material improvement technology  
Understanding techniques for strengthening and stabilizing difficult-to-handle ground materials with solidified materials and short discrete fibers.

You must prepare and review materials/handouts used in seminar. In addition, you will be required to submit several report assignments, so submit them.

### Textbook

The related papers will be selected and distributed as appropriate as the seminar progresses.

### Additional Reading

References will be introduced as necessary.

### Grade Assessment

The degree of achievement of goals is comprehensively evaluated by making presentations at seminar, answering questions, contributing to discussions, and reporting on issues. The contributions are those that answer the questions and those that summarize the contents of the literature. Acceptance criteria are to be able to logically consider and discuss based on the knowledge obtained through the class, such as the extraction and resolution of various problems in geomaterials engineering.

### Notes

No course requirements are required.

Lecture is held by ONLINE by using Zoom or Teams.

Ask questions to lecturer using E-mail.

Exchange opinions between students regarding the class using the NUCT function "Message".

### Contacting Faculty

Welcome questions during and after this seminar. Each member also accepts questions at the room and by e-mail at any time.

Masaki NAKANO: Ex.4622, nakano (at) civil.nagoya-u.ac.jp

Takayuki Sakai: Ex.2734t-sakai (at) civil.nagoya-u.ac.jp

Please replace (at) with @.

## Seminar on Geomaterial Engineering1C (2.0credits) (地盤材料工学セミナー1C)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Spring Semester	2 Autumn Semester
Lecturer	Masaki NAKANO Professor	SAKAITakayuki Assistant Professor

### Course Purpose

This course introduces the latest knowledge of geotechnical engineering and geotechnical material engineering in order to acquire knowledge of advanced specialized fields based on engineering basics and related boundary areas with the aim of training comprehensive and applied skills, problem excavation and solution skills. The aim of this course is to understand research trends, related research areas, and social trends, to discuss measures for extracting and solving issues, and to understand the relationship with basic science as well as to acquire the reading comprehension skills and presentation skills necessary for conducting and developing research. The aim of this course is to understand research trends, related research areas, and social trends, to discuss measures for extracting and solving issues, and to understand the relationship with basic science as well as to acquire the reading comprehension skills and presentation skills necessary for conducting and developing research.

The goals of this course are to

- (1) Understand and explain theoretical, experimental, and numerical research methods in geotechnical engineering and geotechnical material engineering.
- (2) Understand domestic and overseas research trends in related fields.

### Prerequisite Subjects

Advanced Geotechnical Engineering, Advanced Mechanics of Geomaterials, Advanced Soil Dynamics, Advanced Continuum Mechanics, Advanced Numerical Analysis, Advanced Work in Soil Mechanics and Geotechnical Engineering

### Course Topics

1. Mechanical behavior of basic materials used in soil mechanics and geotechnical engineering  
Learning mainly about the mechanical behavior of typical sand, clay, and intermediate soils, and the description using elastoplastic constitutive models
2. Mechanical behavior of special soil and problematic soil  
Understanding and modeling the mechanical behavior of soil materials having weathering, expansive, and friable properties.
3. Effective use of generated soil and disaster waste  
Measurement to make effective usage of construction waste soil and recovered soil from disaster waste as soil material
4. Features of overseas earth materials  
Understanding the characteristics of soil generated during construction overseas and soil materials causing geological disasters.
5. Ground material improvement technology  
Understanding techniques for strengthening and stabilizing difficult-to-handle ground materials with solidified materials and short discrete fibers.

You must prepare and review materials/handouts used in seminar. In addition, you will be required to submit several report assignments, so submit them.

### Textbook

The related papers will be selected and distributed as appropriate as the seminar progresses.

### Additional Reading

References will be introduced as necessary.

### Grade Assessment

The degree of achievement of goals is comprehensively evaluated by making presentations at seminar, answering questions, contributing to discussions, and reporting on issues. The contributions are those that answer the questions and those that summarize the contents of the literature. Acceptance criteria are to be able to logically consider and discuss based on the knowledge obtained through the class, such as the extraction and resolution of various problems in geomaterials engineering.

### Notes

No course requirements are required.

Lecture is held by ONLINE by using Zoom or Teams.

Ask questions to lecturer using E-mail.

Exchange opinions between students regarding the class using the NUCT function "Message".

### Contacting Faculty

Welcome questions during and after this seminar. Each member also accepts questions at the room and by e-mail at any time.

Masaki NAKANO: Ex.4622, nakano (at) civil.nagoya-u.ac.jp

Takayuki Sakai: Ex.2734t-sakai (at) civil.nagoya-u.ac.jp

Please replace (at) with @.



## Seminar on Geomaterial Engineering1D (2.0credits) (地盤材料工学セミナー1D)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Autumn Semester	2 Spring Semester
Lecturer	Masaki NAKANO Professor	SAKAITakayuki Assistant Professor

### Course Purpose

This course introduces the latest knowledge of geotechnical engineering and geotechnical material engineering in order to acquire knowledge of advanced specialized fields based on engineering basics and related boundary areas with the aim of training comprehensive and applied skills, problem excavation and solution skills. The aim of this course is to understand research trends, related research areas, and social trends, to discuss measures for extracting and solving issues, and to understand the relationship with basic science as well as to acquire the reading comprehension skills and presentation skills necessary for conducting and developing research. The aim of this course is to understand research trends, related research areas, and social trends, to discuss measures for extracting and solving issues, and to understand the relationship with basic science as well as to acquire the reading comprehension skills and presentation skills necessary for conducting and developing research.

The goals of this course are to

- (1) Understand and explain theoretical, experimental, and numerical research methods in geotechnical engineering and geotechnical material engineering.
- (2) Understand domestic and overseas research trends in related fields.

### Prerequisite Subjects

Advanced Geotechnical Engineering, Advanced Mechanics of Geomaterials, Advanced Soil Dynamics, Advanced Continuum Mechanics, Advanced Numerical Analysis, Advanced Work in Soil Mechanics and Geotechnical Engineering

### Course Topics

1. Mechanical behavior of basic materials used in soil mechanics and geotechnical engineering  
Learning mainly about the mechanical behavior of typical sand, clay, and intermediate soils, and the description using elastoplastic constitutive models
2. Mechanical behavior of special soil and problematic soil  
Understanding and modeling the mechanical behavior of soil materials having weathering, expansive, and friable properties.
3. Effective use of generated soil and disaster waste  
Measurement to make effective usage of construction waste soil and recovered soil from disaster waste as soil material
4. Features of overseas earth materials  
Understanding the characteristics of soil generated during construction overseas and soil materials causing geological disasters.
5. Ground material improvement technology  
Understanding techniques for strengthening and stabilizing difficult-to-handle ground materials with solidified materials and short discrete fibers.

You must prepare and review materials/handouts used in seminar. In addition, you will be required to submit several report assignments, so submit them.

### Textbook

The related papers will be selected and distributed as appropriate as the seminar progresses.

### Additional Reading

References will be introduced as necessary.

### Grade Assessment

The degree of achievement of goals is comprehensively evaluated by making presentations at seminar, answering questions, contributing to discussions, and reporting on issues. The contributions are those that answer the questions and those that summarize the contents of the literature. Acceptance criteria are to be able to logically consider and discuss based on the knowledge obtained through the class, such as the extraction and resolution of various problems in geomaterials engineering.

### Notes

No course requirements are required.

Lecture is held by ONLINE by using Zoom or Teams.

Ask questions to lecturer using E-mail.

Exchange opinions between students regarding the class using the NUCT function "Message".

### Contacting Faculty

Welcome questions during and after this seminar. Each member also accepts questions at the room and by e-mail at any time.

Masaki NAKANO: Ex.4622, nakano (at) civil.nagoya-u.ac.jp

Takayuki Sakai: Ex.2734t-sakai (at) civil.nagoya-u.ac.jp

Please replace (at) with @.

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	1 Spring Semester	1 Autumn Semester	
Lecturer	Toshihiro NODA Professor Tomohiro TOYODA Assistant Professor	Kentaro NAKAI Associate Professor	YOSHIKAWA Takahiro Assistant Professor

### Course Purpose

The purpose of this seminar is to acquire the basics of geotechnical engineering, seismic engineering, and geo-disaster prevention engineering related to the safety of ground and soil structures, and to understand effective design principles and ground countermeasures. It also aims to acquire reading comprehension skills and presentation skills necessary for conducting and developing research.

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

1. Understand and explain theoretical, experimental, and numerical research methods in geotechnical engineering, seismic engineering, and geo-disaster prevention engineering.
2. Understand and explain domestic and overseas research trends in related fields.

### Prerequisite Subjects

Advanced Geotechnical Engineering, Advanced Mechanics of Geomaterials, Advanced Soil Dynamics, Advanced Continuum Mechanics, Advanced Numerical Analysis, Advanced Work in Soil Mechanics and Geotechnical Engineering

### Course Topics

1. Fundamentals of soft ground mechanics
2. Deformation and stability of ground structure
3. Design method of ground and structure in soft ground
4. Design of ground reinforcement and improvement method
5. Basics of seismic engineering
6. How to create input ground motion for design
7. Seismic response analysis and seismic safety evaluation

Materials used in lectures must be prepared and reviewed. In addition, students will be required to submit several report assignments.

### Textbook

Printed documents will be distributed.

### Additional Reading

References will be introduced as necessary.

### Grade Assessment

Comprehensively evaluate the achievement of goals by making presentations at seminars, answering questions, contributing to discussions, and issue reports. Contributions include statements that answer questions and summarize the contents of the literature. Acceptance criteria are to be able to logically consider and argue based on the knowledge obtained through lectures, such as extracting and solving various problems in geotechnical engineering, seismic engineering, and geological disaster prevention engineering.

### Notes

Not required.

In principle, this lecture will be provided online using Zoom or Microsoft Teams.

Contacting Faculty

Questions during and after the lecture are welcome. E-mail questions are also accepted at any time.

Toshihiro NODA, Ext: 3833, E-mail: noda(at)nagoya-u.jp, Bldg. 9 Rm. 317

Kentaro NAKAI, Ext: 5203, E-mail: nakai(at)civil.nagoya-u.ac.jp, Bldg. 9 Rm. 313

Takahiro YOSHIKAWA, Ext: 3834, E-mail: yoshikawa(at)civil.nagoya-u.ac.jp, Bldg. 9 Rm. 315

Please replace (at) with @.

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	1 Autumn Semester	1 Spring Semester	
Lecturer	Toshihiro NODA Professor Tomohiro TOYODA Assistant Professor	Kentaro NAKAI Associate Professor	YOSHIKAWA Takahiro Assistant Professor

### Course Purpose

The purpose of this seminar is to acquire the basics of geotechnical engineering, seismic engineering, and geo-disaster prevention engineering related to the safety of ground and soil structures, and to understand effective design principles and ground countermeasures. It also aims to acquire reading comprehension skills and presentation skills necessary for conducting and developing research.

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

1. Understand and explain theoretical, experimental, and numerical research methods in geotechnical engineering, seismic engineering, and geo-disaster prevention engineering.
2. Understand and explain domestic and overseas research trends in related fields.

### Prerequisite Subjects

Advanced Geotechnical Engineering, Advanced Mechanics of Geomaterials, Advanced Soil Dynamics, Advanced Continuum Mechanics, Advanced Numerical Analysis, Advanced Work in Soil Mechanics and Geotechnical Engineering

### Course Topics

1. Fundamentals of soft ground mechanics
2. Deformation and stability of ground structure
3. Design method of ground and structure in soft ground
4. Design of ground reinforcement and improvement method
5. Basics of seismic engineering
6. How to create input ground motion for design
7. Seismic response analysis and seismic safety evaluation

Materials used in lectures must be prepared and reviewed. In addition, students will be required to submit several report assignments.

### Textbook

Printed documents will be distributed.

### Additional Reading

References will be introduced as necessary.

### Grade Assessment

Comprehensively evaluate the achievement of goals by making presentations at seminars, answering questions, contributing to discussions, and issue reports. Contributions include statements that answer questions and summarize the contents of the literature. Acceptance criteria are to be able to logically consider and argue based on the knowledge obtained through lectures, such as extracting and solving various problems in geotechnical engineering, seismic engineering, and geological disaster prevention engineering.

### Notes

Not required.

In principle, this lecture will be provided online using Zoom or Microsoft Teams.

Contacting Faculty

Questions during and after the lecture are welcome. E-mail questions are also accepted at any time.

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Takahiro YOSHIKAWA, Ext: 3834, E-mail: yoshikawa(at)civil.nagoya-u.ac.jp, Bldg. 9 Rm. 315

Please replace (at) with @.

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	2 Spring Semester	2 Autumn Semester	
Lecturer	Toshihiro NODA Professor Tomohiro TOYODA Assistant Professor	Kentaro NAKAI Associate Professor	YOSHIKAWA Takahiro Assistant Professor

### Course Purpose

The purpose of this seminar is to acquire the basics of geotechnical engineering, seismic engineering, and geo-disaster prevention engineering related to the safety of ground and soil structures, and to understand effective design principles and ground countermeasures. It also aims to acquire reading comprehension skills and presentation skills necessary for conducting and developing research.

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

1. Understand and explain theoretical, experimental, and numerical research methods in geotechnical engineering, seismic engineering, and geo-disaster prevention engineering.
2. Understand and explain domestic and overseas research trends in related fields.

### Prerequisite Subjects

Advanced Geotechnical Engineering, Advanced Mechanics of Geomaterials, Advanced Soil Dynamics, Advanced Continuum Mechanics, Advanced Numerical Analysis, Advanced Work in Soil Mechanics and Geotechnical Engineering

### Course Topics

1. Fundamentals of soft ground mechanics
2. Deformation and stability of ground structure
3. Design method of ground and structure in soft ground
4. Design of ground reinforcement and improvement method
5. Basics of seismic engineering
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Materials used in lectures must be prepared and reviewed. In addition, students will be required to submit several report assignments.

### Textbook

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### Additional Reading

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### Grade Assessment

Comprehensively evaluate the achievement of goals by making presentations at seminars, answering questions, contributing to discussions, and issue reports. Contributions include statements that answer questions and summarize the contents of the literature. Acceptance criteria are to be able to logically consider and argue based on the knowledge obtained through lectures, such as extracting and solving various problems in geotechnical engineering, seismic engineering, and geological disaster prevention engineering.

### Notes

Not required.

In principle, this lecture will be provided online using Zoom or Microsoft Teams.

Contacting Faculty

Questions during and after the lecture are welcome. E-mail questions are also accepted at any time.

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Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	2 Autumn Semester	2 Spring Semester	
Lecturer	Toshihiro NODA Professor Tomohiro TOYODA Assistant Professor	Kentaro NAKAI Associate Professor	YOSHIKAWA Takahiro Assistant Professor

### Course Purpose

The purpose of this seminar is to acquire the basics of geotechnical engineering, seismic engineering, and geo-disaster prevention engineering related to the safety of ground and soil structures, and to understand effective design principles and ground countermeasures. It also aims to acquire reading comprehension skills and presentation skills necessary for conducting and developing research.

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

1. Understand and explain theoretical, experimental, and numerical research methods in geotechnical engineering, seismic engineering, and geo-disaster prevention engineering.
2. Understand and explain domestic and overseas research trends in related fields.

### Prerequisite Subjects

Advanced Geotechnical Engineering, Advanced Mechanics of Geomaterials, Advanced Soil Dynamics, Advanced Continuum Mechanics, Advanced Numerical Analysis, Advanced Work in Soil Mechanics and Geotechnical Engineering

### Course Topics

1. Fundamentals of soft ground mechanics
2. Deformation and stability of ground structure
3. Design method of ground and structure in soft ground
4. Design of ground reinforcement and improvement method
5. Basics of seismic engineering
6. How to create input ground motion for design
7. Seismic response analysis and seismic safety evaluation

Materials used in lectures must be prepared and reviewed. In addition, students will be required to submit several report assignments.

### Textbook

Printed documents will be distributed.

### Additional Reading

References will be introduced as necessary.

### Grade Assessment

Comprehensively evaluate the achievement of goals by making presentations at seminars, answering questions, contributing to discussions, and issue reports. Contributions include statements that answer questions and summarize the contents of the literature. Acceptance criteria are to be able to logically consider and argue based on the knowledge obtained through lectures, such as extracting and solving various problems in geotechnical engineering, seismic engineering, and geological disaster prevention engineering.

### Notes

Not required.

In principle, this lecture will be provided online using Zoom or Microsoft Teams.

### Contacting Faculty

Questions during and after the lecture are welcome. E-mail questions are also accepted at any time.

Toshihiro NODA, Ext: 3833, E-mail: noda(at)nagoya-u.jp, Bldg. 9 Rm. 317

Kentaro NAKAI, Ext: 5203, E-mail: nakai(at)civil.nagoya-u.ac.jp, Bldg. 9 Rm. 313

Takahiro YOSHIKAWA, Ext: 3834, E-mail: yoshikawa(at)civil.nagoya-u.ac.jp, Bldg. 9 Rm. 315

Please replace (at) with @.

## Seminar on Maintenance of Civil Structures 1A (2.0credits) (社会基盤維持管理学セミナー1A)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	1 Spring Semester	1 Autumn Semester	
Lecturer	KazuoTATEISHI Professor	Takeshi HANJI Associate Professor	Masaru Shimizu Assistant Professor

### Course Purpose

Through case studies in Japan and other countries, this seminar aims to acquire a wide range of knowledge on the basic design concept and safety evaluation of infrastructures, and to discuss design concept, maintenance, and long-term management method for infrastructures.

After completing this course, students will be able to:

1. understand design concepts of civil structures, and
2. improve skills on reading comprehension and presentation.

### Prerequisite Subjects

Advanced Course in Lifecycle Design of Civil Structures  
Advanced Steel Structures  
Advanced Concrete Structures  
Exercise in Inspection of Civil Structures

### Course Topics

Reading and discussing some literature on history, design and maintenance of infrastructures.

Students need to prepare the next seminar to understand basic parts and also actively join in the discussion throughout the seminar.

### Textbook

Textbooks will be determined by the supervisors.

### Additional Reading

Reference books will be determined by the supervisors.

### Grade Assessment

Evaluation will be comprehensively based on presentation and discussion among students, etc.  
Requirements to pass are to be able to actively participate in the activities at the seminar.

### Notes

No requirements.

This seminar is planning to be face-to-face type, but depending on the situation of COVID-19, it may be changed to online (Zoom or Teams) type. In this case, the information on the online seminar will be informed through NUCT.

Students who have a question on this class can contact to Takeshi HANJI (hanji(at)civil.nagoya-u.ac.jp).

### Contacting Faculty

Students are encouraged to ask questions anytime.

## Seminar on Maintenance of Civil Structures 1B (2.0credits) (社会基盤維持管理学セミナー1B)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	1 Autumn Semester	1 Spring Semester	
Lecturer	KazuoTATEISHI Professor	Takeshi HANJI Associate Professor	Masaru Shimizu Assistant Professor

### Course Purpose

Through case studies in Japan and other countries, this seminar aims to acquire a wide range of knowledge on the basic design concept and safety evaluation of infrastructures, and to discuss design concept, maintenance, and long-term management method for infrastructures.

After completing this course, students will be able to:

- 1.understand design concepts of civil structures, and
- 2.improve skills on reading comprehension and presentation.

### Prerequisite Subjects

Advanced Course in Lifecycle Design of Civil Structures  
Advanced Steel Structures  
Advanced Concrete Structures  
Exercise in Inspection of Civil Structures

### Course Topics

Reading and discussing some literature on history, design and maintenance of infrastructures.

Students need to prepare the next seminar to understand basic parts and also actively join in the discussion throughout the seminar.

### Textbook

Textbooks will be determined by the supervisors.

### Additional Reading

Reference books will be determined by the supervisors.

### Grade Assessment

Evaluation will be comprehensively based on presentation and discussion among students, etc.  
Requirements to pass are to be able to actively participate in the activities at the seminar.

### Notes

No requirements.

This seminar is planning to be face-to-face type, but depending on the situation of COVID-19, it may be changed to online (Zoom or Teams) type. In this case, the information on the online seminar will be informed through NUCT.

Students who have a question on this class can contact to Takeshi HANJI (hanji(at)civil.nagoya-u.ac.jp).

### Contacting Faculty

Students are encouraged to ask questions anytime.

## Seminar on Maintenance of Civil Structures 1C (2.0credits) (社会基盤維持管理学セミナー1C)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	2 Spring Semester	2 Autumn Semester	
Lecturer	KazuoTATEISHI Professor	Takeshi HANJI Associate Professor	Masaru Shimizu Assistant Professor

### Course Purpose

Through case studies in Japan and other countries, this seminar aims to acquire a wide range of knowledge on the basic design concept and safety evaluation of infrastructures, and to discuss design concept, maintenance, and long-term management method for infrastructures.

After completing this course, students will be able to:

1. understand design concepts of civil structures, and
2. improve skills on reading comprehension and presentation.

### Prerequisite Subjects

Advanced Course in Lifecycle Design of Civil Structures  
Advanced Steel Structures  
Advanced Concrete Structures  
Exercise in Inspection of Civil Structures

### Course Topics

Reading and discussing some literature on history, design and maintenance of infrastructures.

Students need to prepare the next seminar to understand basic parts and also actively join in the discussion throughout the seminar.

### Textbook

Textbooks will be determined by the supervisors.

### Additional Reading

Reference books will be determined by the supervisors.

### Grade Assessment

Evaluation will be comprehensively based on presentation and discussion among students, etc.  
Requirements to pass are to be able to actively participate in the activities at the seminar.

### Notes

No requirements.

This seminar is planning to be face-to-face type, but depending on the situation of COVID-19, it may be changed to online (Zoom or Teams) type. In this case, the information on the online seminar will be informed through NUCT.

Students who have a question on this class can contact to Takeshi HANJI (hanji(at)civil.nagoya-u.ac.jp).

### Contacting Faculty

Students are encouraged to ask questions anytime.

## Seminar on Maintenance of Civil Structures 1D (2.0credits) (社会基盤維持管理学セミナー1D)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	2 Autumn Semester	2 Spring Semester	
Lecturer	KazuoTATEISHI Professor	Takeshi HANJI Associate Professor	Masaru Shimizu Assistant Professor

### Course Purpose

Through case studies in Japan and other countries, this seminar aims to acquire a wide range of knowledge on the basic design concept and safety evaluation of infrastructures, and to discuss design concept, maintenance, and long-term management method for infrastructures.

After completing this course, students will be able to:

- 1.understand design concepts of civil structures, and
- 2.improve skills on reading comprehension and presentation.

### Prerequisite Subjects

Advanced Course in Lifecycle Design of Civil Structures  
Advanced Steel Structures  
Advanced Concrete Structures  
Exercise in Inspection of Civil Structures

### Course Topics

Reading and discussing some literature on history, design and maintenance of infrastructures.

Students need to prepare the next seminar to understand basic parts and also actively join in the discussion throughout the seminar.

### Textbook

Textbooks will be determined by the supervisors.

### Additional Reading

Reference books will be determined by the supervisors.

### Grade Assessment

Evaluation will be comprehensively based on presentation and discussion among students, etc.  
Requirements to pass are to be able to actively participate in the activities at the seminar.

### Notes

No requirements.

This seminar is planning to be face-to-face type, but depending on the situation of COVID-19, it may be changed to online (Zoom or Teams) type. In this case, the information on the online seminar will be informed through NUCT.

Students who have a question on this class can contact to Takeshi HANJI (hanji(at)civil.nagoya-u.ac.jp).

### Contacting Faculty

Students are encouraged to ask questions anytime.

## Land Design Seminar 1A (2.0credits) (国土デザイン学セミナー1A)

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Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Autumn Semester
Lecturer	NAKAMURASHinichiro Associate Professor	

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### Course Purpose

Students cultivate a capacity for understanding and expressiveness related to methodologies to create cultural, safe and secure regional and infrastructure design under the climate change and the aging society, in which technologies, institutions and policy measures are discussed within the scope of regional design, economy and public policy analysis.

### Prerequisite Subjects

Urban and Regional Planning

### Course Topics

Students review and collect the relevant advanced and recent literatures related to methodologies to create cultural, safe and secure region and infrastructure. The results are presented and discussed together with students and the supervisor. In each lecture, one or two students will give a presentation, and the student prepare the presentation in advance.

### Textbook

None.

### Additional Reading

Intergovernmental Panel on Climate Change(IPCC): Fifth Assessment Report (AR5), 2014,  
<http://www.ipcc.ch/index.html>.Maggie Black, Jannet KingThe: Atlas of Water: Mapping the World's Most Critical Resource, University of California Press(2009)

### Grade Assessment

Students are evaluated based on their presentation and discussion skills and their ability to present and discuss in the seminar. Students will be required to have an appropriate understanding of the main points of each literature and be able to provide an accurate summary.Attendance at each seminar is a requirement for receiving credit.

### Notes

No course requirements are required.If you take this course, please inform the instructor.The class will be conducted off-line or remotely using Zoom.The URL of Zoom will be informed to the students by e-mail.All questions and exchanges will take during the lectures.

### Contacting Faculty

Sending e-mail or visiting the supervisor's office.E-mail: [shinichiro@civil.nagoya-u.ac.jp](mailto:shinichiro@civil.nagoya-u.ac.jp)Office: Room 305, Engineering Building No.9

## Land Design Seminar 1B (2.0credits) (国土デザイン学セミナー1B)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Autumn Semester	1 Spring Semester
Lecturer	NAKAMURASHinichiro Associate Professor	

### Course Purpose

Students cultivate a capacity for understanding and expressiveness related to methodologies to create cultural, safe and secure regional and infrastructure design under the climate change and the aging society, in which technologies, institutions and policy measures are discussed within the scope of regional design, economy and public policy analysis. The goal of this lecture is for students to be able to accurately grasp the main points of academic papers and to be able to concisely summarize their contents.

### Prerequisite Subjects

Urban and Regional Planning

### Course Topics

Students review and collect the relevant advanced and recent literatures related to methodologies to create cultural, safe and secure region and infrastructure. The results are presented and discussed together with students and the supervisor. In each lecture, one or two students will give a presentation, and the student prepare the presentation in advance.

### Textbook

The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body for assessing the science related to climate change: <https://www.ipcc.ch/>

### Additional Reading

Intergovernmental Panel on Climate Change(IPCC): Fifth Assessment Report (AR5), 2014, <http://www.ipcc.ch/index.html>.

Maggie Black, Jannet KingThe: Atlas of Water: Mapping the World's Most Critical Resource, University of California Press(2009)

### Grade Assessment

Students are evaluated based on their presentation and discussion skills and their ability to present and discuss in the seminar. Students will be required to have an appropriate understanding of the main points of each literature and be able to provide an accurate summary.

Attendance at each seminar is a requirement for receiving credit.

### Notes

No course requirements are required.

If you take this course, please inform the instructor.

The class will be conducted off-line or remotely using Zoom.

The URL of Zoom will be informed to the students by e-mail.

All questions and exchanges will take during the lectures.

### Contacting Faculty

Sending e-mail or visiting the supervisor's office.

E-mail: [shinichiro@civil.nagoya-u.ac.jp](mailto:shinichiro@civil.nagoya-u.ac.jp)

Office: Room 305, Engineering Building No.9



## Land Design Seminar 1C (2.0credits) (国土デザイン学セミナー1C)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Spring Semester	2 Autumn Semester
Lecturer	NAKAMURASHinichiro Associate Professor	

### Course Purpose

Students cultivate a capacity for understanding and expressiveness related to methodologies to create cultural, safe and secure regional and infrastructure design under the climate change and the aging society, in which technologies, institutions and policy measures are discussed within the scope of regional design, economy and public policy analysis. The goal of this lecture is for students to be able to accurately grasp the main points of academic papers and to be able to concisely summarize their contents.

### Prerequisite Subjects

Urban and Regional Planning

### Course Topics

Students review and collect the relevant advanced and recent literatures related to methodologies to create cultural, safe and secure region and infrastructure. The results are presented and discussed together with students and the supervisor. In each lecture, one or two students will give a presentation, and the student prepare the presentation in advance.

### Textbook

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### Additional Reading

Intergovernmental Panel on Climate Change(IPCC): Fifth Assessment Report (AR5), 2014, <http://www.ipcc.ch/index.html>. Maggie Black, Jannet King: The Atlas of Water: Mapping the World's Most Critical Resource, University of California Press(2009)

### Grade Assessment

Students are evaluated based on their presentation and discussion skills and their ability to present and discuss in the seminar. Students will be required to have an appropriate understanding of the main points of each literature and be able to provide an accurate summary. Attendance at each seminar is a requirement for receiving credit.

### Notes

No course requirements are required. If you take this course, please inform the instructor. The class will be conducted off-line or remotely using Zoom. The URL of Zoom will be informed to the students by e-mail. All questions and exchanges will take during the lectures.

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## Land Design Seminar 1D (2.0credits) (国土デザイン学セミナー1D)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Autumn Semester	2 Spring Semester
Lecturer	NAKAMURASHinichiro Associate Professor	

### Course Purpose

Students cultivate a capacity for understanding and expressiveness related to methodologies to create cultural, safe and secure regional and infrastructure design under the climate change and the aging society, in which technologies, institutions and policy measures are discussed within the scope of regional design, economy and public policy analysis. The goal of this lecture is for students to be able to accurately grasp the main points of academic papers and to be able to concisely summarize their contents.

### Prerequisite Subjects

Urban and Regional Planning

### Course Topics

Students review and collect the relevant advanced and recent literatures related to methodologies to create cultural, safe and secure region and infrastructure. The results are presented and discussed together with students and the supervisor. In each lecture, one or two students will give a presentation, and the student prepare the presentation in advance.

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The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body for assessing the science related to climate change: <https://www.ipcc.ch/>

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Maggie Black, Jannet King: The Atlas of Water: Mapping the World's Most Critical Resource, University of California Press(2009)

### Grade Assessment

Students are evaluated based on their presentation and discussion skills and their ability to present and discuss in the seminar. Students will be required to have an appropriate understanding of the main points of each literature and be able to provide an accurate summary.

Attendance at each seminar is a requirement for receiving credit.

### Notes

No course requirements are required.

If you take this course, please inform the instructor.

The class will be conducted off-line or remotely using Zoom.

The URL of Zoom will be informed to the students by e-mail.

All questions and exchanges will take during the lectures.

### Contacting Faculty

Sending e-mail or visiting the supervisor's office.

E-mail: [shinichiro@civil.nagoya-u.ac.jp](mailto:shinichiro@civil.nagoya-u.ac.jp)

Office: Room 305, Engineering Building No.9

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Autumn Semester
Lecturer	ArataKATAYAMA Professor	KASAI Takuya Assistant Professor

### Course Purpose

In this class, the students learn how the soil and groundwater pollution occurs and how the pollutants migrate in soil and groundwater, the modelling, the bioremediation technologies and microbial behavior, external electron transfer of microorganisms, waste treatment and management.

Students should be able to explain at least one of the following issues with comprehensive understanding:

- 1.Mechanism of soil and groundwater pollution: 2.Fate of pollutants in soil and groundwater:
- 3.Bioremediation technologies and microorganisms: 4.External electron transfer and its microbial system:
- 5.Other physical and chemical remediation/recycle technologies and their assessment.

### Prerequisite Subjects

Human activities and the environment, Environmental geotechnology, Sanitary engineering, Social environmental conservation, Soil Science, Hydrology, Microbiology, Chemistry, Mathematics and etc.

### Course Topics

Seminar on the fundamental phenomena in relation to the pollution of soil and ground water: mechanism and modelling of pollutant behavior, bioremediation technologies and microbial behavior, external electron transfer and its microbial system, waste management and environmental risk assessment and etc.

Individual students are requested to read at least five papers related to the topic selected, to understand the multiple approaches by different research groups, and to present the summary of the papers.

The students are also requested to present their own study with comprehensive understanding of the significance and future prospects. The students are requested to finish the preparation of the documents showing the contents of presentation prior to the class and to distribute them to the participants in the class. For the presentation from other students during the class, the active participation in discussion is expected.

### Textbook

One of the following issues is presented by students with comprehensive understanding by reading more than five recently-published papers:1. Mechanism of soil and groundwater pollution:2. Fate of pollutants in soil and groundwater:3. Bioremediation technologies and microorganisms, 4. External electron transfer and its microbial system, 5. hazardous waste treatment, 6. others. The students are also requested to prepare the documents that summarize their own study.

### Additional Reading

The presenter provide the documents in relation with the issue introduced.

### Grade Assessment

Understanding level, presentation ability, participation to the discussion: Higher than 60 points in 100 as full mark is passed.The grade evaluation is carried out based on the comprehensiveness of understanding on the issue selected for the presentation, on the ability to explain the issue, and on the contribution to the discussion in every issues.

### Notes

There is no pre-requirement for the registration.

Since, students are requested to participate in the discussions, the class will be carried out face-to-face.

Absence is not allowed unless it is difficult to participate face-to-face for unavoidable reasons.

### Contacting Faculty

## Seminar on Conservation of Geoenvironment 1A (2.0credits) (地圏環境保全学セミナー1A)

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The class is carried out by the student presentation and the questions. Therefore, the time for questions are provided and the discussion is carried out extensively.

Email addresses:

Prof. Arata Katayama: a-katayama<a>imass.nagoya-u.ac.jp

Assist. Prof. Takuya Kasai: kasai.takuya<a>imass.nagoya-u.ac.jp

Please replace <a> with @ before sending your email.

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Autumn Semester	1 Spring Semester
Lecturer	ArataKATAYAMA Professor	KASAI Takuya Assistant Professor

### Course Purpose

In this class, the students learn how the soil and groundwater pollution occurs and how the pollutants migrate in soil and groundwater, the modelling, the bioremediation technologies and microbial behavior, external electron transfer of microorganisms, waste treatment and management.

Students should be able to explain at least one of the following issues with comprehensive understanding:

- 1.Mechanism of soil and groundwater pollution: 2.Fate of pollutants in soil and groundwater:
- 3.Bioremediation technologies and microorganisms: 4.External electron transfer and its microbial system:
- 5.Other physical and chemical remediation/recycle technologies and their assessment.

### Prerequisite Subjects

Human activities and the environment, Environmental geotechnology, Sanitary engineering, Social environmental conservation, Soil Science, Hydrology, Microbiology, Chemistry, Mathematics, Seminar on Conservation of Geoenvironment 1A and etc.

### Course Topics

Seminar on the fundamental phenomena in relation to the pollution of soil and ground water: mechanism and modelling of pollutant behavior, bioremediation technologies and microbial behavior, external electron transfer and its microbial system, waste management and environmental risk assessment and etc.

Individual students are requested to read at least five papers related to the topic selected, to understand the multiple approaches by different research groups, and to present the summary of the papers. The students are also requested to present their own study with comprehensive understanding of the significance and future prospects. The students are requested to finish the preparation of the documents showing the contents of presentation prior to the class and to distribute them to the participants in the class. For the presentation from other students during the class, the active participation in discussion is expected.

### Textbook

One of the following issues is presented by students with comprehensive understanding by reading more than five recently-published papers:1. Mechanism of soil and groundwater pollution:2. Fate of pollutants in soil and groundwater:3. Bioremediation technologies and microorganisms, 4. External electron transfer and its microbial system, 5. hazardous waste treatment, 6. others. The students are also requested to prepare the documents that summarize their own study.

### Additional Reading

The presenter provide the documents in relation with the issue introduced.

### Grade Assessment

Understanding level, presentation ability, participation to the discussion: Higher than 60 points in 100 as full mark is passed.

The grade evaluation is carried out based on the comprehensiveness of understanding on the issue selected for the presentation, on the ability to explain the issue, and on the contribution to the discussion in every issues.

### Notes

There is no pre-requirement for the registration.

Since, students are requested to participate in the discussions, the class will be carried out face-to-face.

Absence is not allowed unless it is difficult to participate face-to-face for unavoidable reasons.

### Contacting Faculty

The class is carried out by the student presentation and the questions. Therefore, the time for questions are provided and the discussion is carried out extensively.

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Spring Semester	2 Autumn Semester
Lecturer	ArataKATAYAMA Professor	KASAI Takuya Assistant Professor

### Course Purpose

In this class, the students learn how the soil and groundwater pollution occurs and how the pollutants migrate in soil and groundwater, the modelling, the bioremediation technologies and microbial behavior, external electron transfer of microorganisms, waste treatment and management.

Students should be able to explain at least one of the following issues with comprehensive understanding:

- 1.Mechanism of soil and groundwater pollution: 2.Fate of pollutants in soil and groundwater:
- 3.Bioremediation technologies and microorganisms: 4.External electron transfer and its microbial system:
- 5.Other physical and chemical remediation/recycle technologies and their assessment.

### Prerequisite Subjects

Human activities and the environment, Environmental geotechnology, Sanitary engineering, Social environmental conservation, Soil Science, Hydrology, Microbiology, Chemistry, Mathematics, Seminar on Conservation of Geoenvironment 1A, 1B and etc.

### Course Topics

Seminar on the fundamental phenomena in relation to the pollution of soil and ground water: mechanism and modelling of pollutant behavior, bioremediation technologies and microbial behavior, external electron transfer and its microbial system, waste management and environmental risk assessment and etc.

Individual students are requested to read at least five papers related to the topic selected, to understand the multiple approaches by different research groups, and to present the summary of the papers. The students are also requested to present their own study with comprehensive understanding of the significance and future prospects. The students are requested to finish the preparation of the documents showing the contents of presentation prior to the class and to distribute them to the participants in the class. For the presentation from other students during the class, the active participation in discussion is expected.

### Textbook

One of the following issues is presented by students with comprehensive understanding by reading more than five recently-published papers:1. Mechanism of soil and groundwater pollution:2. Fate of pollutants in soil and groundwater:3. Bioremediation technologies and microorganisms, 4. External electron transfer and its microbial system, 5. hazardous waste treatment, 6. others. The students are also requested to prepare the documents that summarize their own study.

### Additional Reading

The presenter provide the documents in relation with the issue introduced.

### Grade Assessment

Understanding level, presentation ability, participation to the discussion: Higher than 60 points in 100 as full mark is passed.

The grade evaluation is carried out based on the comprehensiveness of understanding on the issue selected for the presentation, on the ability to explain the issue, and on the contribution to the discussion in every issues.

### Notes

There is no pre-requirement for the registration.

Since, students are requested to participate in the discussions, the class will be carried out face-to-face.

Absence is not allowed unless it is difficult to participate face-to-face for unavoidable reasons.

### Contacting Faculty

The class is carried out by the student presentation and the questions. Therefore, the time for questions are provided and the discussion is carried out extensively.



Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Autumn Semester	2 Spring Semester
Lecturer	ArataKATAYAMA Professor	KASAI Takuya Assistant Professor

### Course Purpose

In this class, the students learn how the soil and groundwater pollution occurs and how the pollutants migrate in soil and groundwater, the modelling, the bioremediation technologies and microbial behavior, external electron transfer of microorganisms, waste treatment and management.

Students should be able to explain at least one of the following issues with comprehensive understanding:

- 1.Mechanism of soil and groundwater pollution: 2.Fate of pollutants in soil and groundwater:
- 3.Bioremediation technologies and microorganisms: 4.External electron transfer and its microbial system:
- 5.Other physical and chemical remediation/recycle technologies and their assessment.

### Prerequisite Subjects

Human activities and the environment, Environmental geotechnology, Sanitary engineering, Social environmental conservation, Soil Science, Hydrology, Microbiology, Chemistry, Mathematics, Seminar on Conservation of Geoenvironment 1A, 1B, 1C and etc.

### Course Topics

Seminar on the fundamental phenomena in relation to the pollution of soil and ground water: mechanism and modelling of pollutant behavior, bioremediation technologies and microbial behavior, external electron transfer and its microbial system, waste management and environmental risk assessment and etc.

Individual students are requested to read at least five papers related to the topic selected, to understand the multiple approaches by different research groups, and to present the summary of the papers. The students are also requested to present their own study with comprehensive understanding of the significance and future prospects. The students are requested to finish the preparation of the documents showing the contents of presentation prior to the class and to distribute them to the participants in the class. For the presentation from other students during the class, the active participation in discussion is expected.

### Textbook

One of the following issues is presented by students with comprehensive understanding by reading more than five recently-published papers:1. Mechanism of soil and groundwater pollution:2. Fate of pollutants in soil and groundwater:3. Bioremediation technologies and microorganisms, 4. External electron transfer and its microbial system, 5. hazardous waste treatment, 6. others. The students are also requested to prepare the documents that summarize their own study.

### Additional Reading

The presenter provide the documents in relation with the issue introduced.

### Grade Assessment

Understanding level, presentation ability, participation to the discussion: Higher than 60 points in 100 as full mark is passed.

The grade evaluation is carried out based on the comprehensiveness of understanding on the issue selected for the presentation, on the ability to explain the issue, and on the contribution to the discussion in every issues.

### Notes

There is no pre-requirement for the registration.

Since, students are requested to participate in the discussions, the class will be carried out face-to-face.

Absence is not allowed unless it is difficult to participate face-to-face for unavoidable reasons.

### Contacting Faculty

The class is carried out by the student presentation and the questions. Therefore, the time for questions are provided and the discussion is carried out extensively.

## Global Environmental Cooperation Seminar1A (2.0credits) (国際環境協力セミナー1A)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Autumn Semester
Lecturer	Kiichiro HAYASHI Professor	

### Course Purpose

The objective of the seminar is to study institutions, policies and assessment methods on sustainable development issues in global and local scales. The seminar will develop the basic and applied skills of students to collect and review relevant literatures and to present the results and findings from their own perspectives, in a comprehensive manner.

The goal of this lecture is that the students will study, analyze and present selected topics by themselves.

### Prerequisite Subjects

Civil Engineering and Policies for Developing Countries I,II, Human activities and the environment, Urban Environmental Systems Engineering

### Course Topics

Students are required to study institutions and policies and assessment methods on sustainable development issues from the perspective of environmental system engineering, environmental policy study and environmental economics. Students are required to collect articles and do study by themselves and present and discuss the results of findings with teachers. Also if there is a student who needs English communication, the seminar will be conducted in English.

The students will do self-study on selected topics outside of this seminar.

### Textbook

Reference documents will be provided if needed.

### Additional Reading

Reference documents will be provided if needed.

### Grade Assessment

Grading will be made taking into consideration understanding level, presentation ability, participation to the discussion, etc.

The C grade is the minimum requirement for passing this lecture.

The success criteria is to study, analyze and present selected topics by themselves on institutions, policies and assessment methods on sustainable development issues in global and local scales

### Notes

no requirement

On site and on line lecture will be provided by teams, zoom, etc.

Questions to teacher will be by NUCT message function.

### Contacting Faculty

After the seminar and/or by e-mail.

The exchange of opinions among students will be conducted by NUCT message function.

## Global Environmental Cooperation Seminar1B (2.0credits) (国際環境協力セミナー1B)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Autumn Semester	1 Spring Semester
Lecturer	Kiichiro HAYASHI Professor	

### Course Purpose

The objective of the seminar is to study institutions, policies and assessment methods on sustainable development issues in global and local scales. The seminar will develop the basic and applied skills of students to collect and review relevant literatures and to present the results and findings from their own perspectives, in a comprehensive manner.

The goal of this lecture is that the students will study, analyze and present a selected topic by themselves.

### Prerequisite Subjects

Civil Engineering and Policies for Developing Countries I, II, Human activities and the environment, Urban Environmental Systems Engineering, Global Environmental Cooperation Seminar1A

### Course Topics

Students are required to study institutions and policies and assessment methods on sustainable development issues from the perspective of environmental system engineering, environmental policy study and environmental economics. Students are required to collect articles and do study by themselves and present and discuss the results of findings with teachers. Also if there is a student who needs English communication, the seminar will be conducted in English.

The students will do self-study on selected topics outside of this seminar.

### Textbook

Reference documents will be provided if needed.

### Additional Reading

Reference documents will be provided if needed.

### Grade Assessment

Grading will be made taking into consideration understanding level, presentation ability, and participation to the discussion, etc.

The C grade is the minimum requirement for passing this lecture.

The success criteria is to study, analyze and present selected topics by themselves on institutions, policies and assessment methods on sustainable development issues in global and local scales

### Notes

no requirement

On site and on line lecture will be provided by teams, zoom, etc.

Questions to teacher will be by NUCT message function.

### Contacting Faculty

After the seminar and/or by e-mail.

The exchange of opinions among students will be conducted by NUCT message function.

## Global Environmental Cooperation Seminar1C (2.0credits) (国際環境協力セミナー1C)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Spring Semester	2 Autumn Semester
Lecturer	Kiichiro HAYASHI Professor	

### Course Purpose

The objective of the seminar is to study institutions, policies and assessment methods on sustainable development issues in global and local scales. The seminar will develop the basic and applied skills of students to collect and review relevant literatures and to present the results and findings from their own perspectives, in a comprehensive manner.

The goal of this lecture is that the students will study, analyze and present a selected topic by themselves.

### Prerequisite Subjects

Civil Engineering and Policies for Developing Countries I, II, Human activities and the environment, Urban Environmental Systems Engineering, Global Environmental Cooperation Seminar1A,1B

### Course Topics

Students are required to study institutions and policies and assessment methods on sustainable development issues from the perspective of environmental system engineering, environmental policy study and environmental economics. Students are required to collect articles and do study by themselves and present and discuss the results of findings with teachers. Also if there is a student who needs English communication, the seminar will be conducted in English.

The students will do self-study on selected topics outside this seminar.

### Textbook

Reference documents will be provided if needed.

### Additional Reading

Reference documents will be provided if needed.

### Grade Assessment

Grading will be made taking into consideration understanding level, presentation ability, and participation to the discussion, etc.

The C grade is the minimum requirement for passing this lecture.

The success criteria is to study, analyze and present selected topics by themselves on institutions, policies and assessment methods on sustainable development issues in global and local scales

### Notes

no requirement

On site and on line lecture will be provided by teams, zoom, etc.

Questions to teacher will be by NUCT message function.

### Contacting Faculty

After the seminar and/or by e-mail.

The exchange of opinions among students will be conducted by NUCT message function.

## Global Environmental Cooperation Seminar1D (2.0credits) (国際環境協力セミナー1D)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Autumn Semester	2 Spring Semester
Lecturer	Kiichiro HAYASHI Professor	

### Course Purpose

The objective of the seminar is to study institutions, policies and assessment methods on sustainable development issues in global and local scales. The seminar will develop the basic and applied skills of students to collect and review relevant literatures and to present the results and findings from their own perspectives, in a comprehensive manner.

The goal of this lecture is that the students will study, analyze and present a selected topic by themselves.

### Prerequisite Subjects

Civil Engineering and Policies for Developing Countries I, II, Human activities and the environment, Urban Environmental Systems Engineering, Global Environmental Cooperation Seminar1A,1B,1C

### Course Topics

Students are required to study institutions and policies and assessment methods on sustainable development issues from the perspective of environmental system engineering, environmental policy study and environmental economics. Students are required to collect articles and do study by themselves and present and discuss the results of findings with teachers. Also if there is a student who needs English communication, the seminar will be conducted in English.

The students will do self-study on selected topics outside this seminar.

### Textbook

Reference documents will be provided if needed.

### Additional Reading

Reference documents will be provided if needed.

### Grade Assessment

Grading will be made taking into consideration understanding level, presentation ability, and participation to the discussion, etc.

The C grade is the minimum requirement for passing this lecture.

The success criteria is to study, analyze and present selected topics by themselves on institutions, policies and assessment methods on sustainable development issues in global and local scales

### Notes

no requirement

On site and on line lecture will be provided by teams, zoom, etc.

Questions to teacher will be by NUCT message function.

### Contacting Faculty

After the seminar and/or by e-mail.

The exchange of opinions among students will be conducted by NUCT message function.

## Seminar on Environmental Ecology System1A (2.0credits) (環境エコロジーシステムセミナー1A)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Autumn Semester
Lecturer	Toshiyuki YAMAMOTO Professor	Tomio MIWA Associate Professor

### Course Purpose

Learn travel behavior analysis, transportation planning, transport and environment dynamics, etc. in order to understand policies for environmental sustainability and related issues.

The purpose of this class is to obtain the knowledge and ability to discuss issues concerned with environmentally sustainable transport such as travel behavior analysis, transportation planning, and transport environment dynamics.

### Prerequisite Subjects

History of City and Civilization, Probability and Statistics, Spatial Planning, Transportation Planning, Infrastructure Planning, Urban and National Land Planning

### Course Topics

Discuss on methodological issues concerned with environmentally sustainable transport such as travel behavior analysis, transportation planning, transport environment dynamics, etc. with the aid of reading advanced English literature.

Presentation team reads the assigned part and prepare the presentation. Questioning team also reads the part and prepare the questions to the presentation team.

### Textbook

To be announced

### Additional Reading

Introduced according to the process of the lecture.

### Grade Assessment

Understanding of issues on environmentally sustainable transport such as travel behavior analysis, transportation planning, and transport environment dynamics.

Presentation and active participation to the class (including questions and comments to presentations of other groups) are evaluated and 60 of 100 points are required to pass.

### Notes

Not required.

Class is conducted through online as on-demand.

URL is informed by email.

If you have any questions about this class, please contact Yamamoto (yamamoto(at)civil.nagoya-u.ac.jp) or Miwa (miwa(at)nagoya-u.jp).

(please exchange "(at)" to "@")

### Contacting Faculty

Students can ask questions to professors at any time during classes.

Questions during off-class hours can be asked via e-mail: yamamoto(at)civil.nagoya-u.ac.jp and miwa(at)nagoya-u.jp

## Seminar on Environmental Ecology System1B (2.0credits) (環境エコロジーシステムセミナー1B)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Autumn Semester	1 Spring Semester
Lecturer	Toshiyuki YAMAMOTO Professor	Tomio MIWA Associate Professor

### Course Purpose

Learn travel behavior analysis, transportation planning, transport and environment dynamics, etc. in order to understand policies for environmental sustainability and related issues.

The purpose of this class is to obtain the knowledge and ability to discuss issues concerned with environmentally sustainable transport such as travel behavior analysis, transportation planning, and transport environment dynamics.

### Prerequisite Subjects

History of City and Civilization, Probability and Statistics, Spatial Planning, Transportation Planning, Infrastructure Planning, Urban and National Land Planning

### Course Topics

Discuss on methodological issues concerned with environmentally sustainable transport such as travel behavior analysis, transportation planning, transport environment dynamics, etc. with the aid of reading advanced English literature.

Presentation team reads the assigned part and prepare the presentation. Questioning team also reads the part and prepare the questions to the presentation team.

### Textbook

To be announced

### Additional Reading

Introduced according to the process of the lecture.

### Grade Assessment

Understanding of issues on environmentally sustainable transport such as travel behavior analysis, transportation planning, and transport environment dynamics.

Presentation and active participation to the class (including questions and comments to presentations of other groups) are evaluated and 60 of 100 points are required to pass.

### Notes

Not required

Class is conducted through online as on-demand.

URL is informed by email.

If you have any questions about this class, please contact Yamamoto (yamamoto(at)civil.nagoya-u.ac.jp) or Miwa (miwa(at)nagoya-u.jp).

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### Contacting Faculty

Students can ask questions to professors at any time during classes.

Questions during off-class hours can be asked via e-mail: yamamoto(at)civil.nagoya-u.ac.jp and miwa(at)nagoya-u.jp



## Seminar on Environmental Ecology System1C (2.0credits) (環境エコロジーシステムセミナー1C)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Spring Semester	2 Autumn Semester
Lecturer	Toshiyuki YAMAMOTO Professor	Tomio MIWA Associate Professor

### Course Purpose

Learn travel behavior analysis, transportation planning, transport and environment dynamics, etc. in order to understand policies for environmental sustainability and related issues.

The purpose of this class is to obtain the knowledge and ability to discuss issues concerned with environmentally sustainable transport such as travel behavior analysis, transportation planning, and transport environment dynamics.

### Prerequisite Subjects

History of City and Civilization, Probability and Statistics, Spatial Planning, Transportation Planning, Infrastructure Planning, Urban and National Land Planning

### Course Topics

Discuss on methodological issues concerned with environmentally sustainable transport such as travel behavior analysis, transportation planning, transport environment dynamics, etc. with the aid of reading advanced English literature.

Presentation team reads the assigned part and prepare the presentation. Questioning team also reads the part and prepare the questions to the presentation team.

### Textbook

To be announced

### Additional Reading

Introduced according to the process of the lecture.

### Grade Assessment

Understanding of issues on environmentally sustainable transport such as travel behavior analysis, transportation planning, and transport environment dynamics.

Presentation and active participation to the class (including questions and comments to presentations of other groups) are evaluated and 60 of 100 points are required to pass.

### Notes

Not required

Class is conducted through online as on-demand.

URL is informed by email.

If you have any questions about this class, please contact Yamamoto (yamamoto(at)civil.nagoya-u.ac.jp) or Miwa (miwa(at)nagoya-u.jp).

(please exchange "(at)" to "@")

### Contacting Faculty

Students can ask questions to professors at any time during classes.

Questions during off-class hours can be asked via e-mail: yamamoto(at)civil.nagoya-u.ac.jp and miwa(at)nagoya-u.jp

## Seminar on Environmental Ecology System1D (2.0credits) (環境エコロジーシステムセミナー1D)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Autumn Semester	2 Spring Semester
Lecturer	Toshiyuki YAMAMOTO Professor	Tomio MIWA Associate Professor

### Course Purpose

Learn travel behavior analysis, transportation planning, transport and environment dynamics, etc. in order to understand policies for environmental sustainability and related issues.

The purpose of this class is to obtain the knowledge and ability to discuss issues concerned with environmentally sustainable transport such as travel behavior analysis, transportation planning, and transport environment dynamics.

### Prerequisite Subjects

History of City and Civilization, Probability and Statistics, Spatial Planning, Transportation Planning, Infrastructure Planning, Urban and National Land Planning

### Course Topics

Discuss on methodological issues concerned with environmentally sustainable transport such as travel behavior analysis, transportation planning, transport environment dynamics, etc. with the aid of reading advanced English literature.

Presentation team reads the assigned part and prepare the presentation. Questioning team also reads the part and prepare the questions to the presentation team.

### Textbook

To be announced

### Additional Reading

To be introduced

### Grade Assessment

Understanding of issues on environmentally sustainable transport such as travel behavior analysis, transportation planning, and transport environment dynamics.

Presentation and active participation to the class (including questions and comments to presentations of other groups) are evaluated and 60 of 100 points are required to pass.

### Notes

Not required

Class is conducted through online as on-demand.

URL is informed by email.

If you have any questions about this class, please contact Yamamoto (yamamoto(at)civil.nagoya-u.ac.jp) or Miwa (miwa(at)nagoya-u.jp).

(please exchange "(at)" to "@")

### Contacting Faculty

Students can ask questions to professors at any time during classes.

Questions during off-class hours can be asked via e-mail: yamamoto(at)civil.nagoya-u.ac.jp and miwa(at)nagoya-u.jp

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

#### 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

#### 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	Lecture		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	1 Autumn Semester	1 Autumn Semester	
Lecturer	Hikaru NAKAMURA Professor	Takeshi HANJI Associate Professor	NISHIGUCHI Koji Lecturer

### Course Purpose

It is the objective of this course to study design method and maintenance of bridge structures in the context of lifecycle management of civil structures. After completing this course, students will be able to:

List different types of structural design methods and explain their differences,

Explain typical design flow of bridge structures, and

Understand current conditions of existing bridges and describe maintenance systems of bridges in Japan.

### Prerequisite Subjects

Advanced Structural Mechanics

Advanced Steel Structures

Advanced Concrete Structures

Exercise in Inspection of Civil Structures

### Course Topics

(1) To study fundamental theory of reliability-based structural design and to understand structural reliability and different design methods such as the allowable stress method and the limit state design method.

(2) To understand a typical flow of structural design which includes structural planning, selection of structural systems, verification of required performances, lifecycle cost analysis, and maintenance plan, by studying design examples of steel and concrete structures.

(3) To understand current conditions of existing bridges in Japan and to study efficient maintenance systems of bridge structures.

Before each class, students need to prepare next class to understand basic parts. After class, the assignments must be completed and submitted by the deadline.

### Textbook

Handouts will be distributed in the class.

### Additional Reading

Reference books will be recommended at the right time.

### Grade Assessment

Evaluation will be comprehensively based on the result of homework assignments and final exam.

Requirements to pass are to be able to correctly understand and explain the basic concepts and terms of bridge design theory and maintenance. Further application of skills and knowledge will be accounted for the grade accordingly.

### Notes

No requirements

This course is planning to consist of live-online (Zoom or Teams) lectures. The detail information and schedule of the exercise will be informed through NUCT.

Students who have a question on this class can contact to Takeshi HANJI (hanji(at)civil.nagoya-u.ac.jp).

### Contacting Faculty

Students are encouraged to ask questions in the class.

## Advanced Fluvial and Coastal Hydrodynamics (2.0credits) (水圏力学特論)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Spring Semester
Lecturer	Tomoaki NAKAMURA Associate Professor	Ryota TSUBAKI Associate Professor

### Course Purpose

The goal of this course is to understand the physical processes in rivers and oceans. This class will provide advanced theories and technologies applied in the management of rivers and coasts based on the relevant courses in undergraduate school.

The objectives of this lecture are

1. to derive/understand/explain the basic equations describing fluvial hydrodynamics
2. to derive/understand/explain the basic equations describing coastal hydrodynamics

### Prerequisite Subjects

Fundamentals of Hydrodynamics with Exercises, Open Channel Hydraulics, Coastal and Maritime Hydrodynamics, Hydrology and River Engineering, Coastal and Ocean Engineering, River and Coastal Environmental Engineering

### Course Topics

1. Outline of the course
2. Governing equations for incompressible viscous fluid flow
3. Shallow water equations
4. Flow resistances in open-channel flow
5. Long wave theory
6. Shallow water wave theory
7. Wave-averaged conservation equations

Reading the corresponding part of the distributed documents prior to the lecture is needed. Reports are asked to submit during the exercise.

### Textbook

Printed documents as needed

### Additional Reading

Directed as needed

### Grade Assessment

Your final grade will be calculated according to reports. To pass, students must understand the basics of theories in river and coastal engineering.

### Notes

No course requirements are specified.

- The class will be given online in the on-demand format and/or the real-time format using Teams/Zoom. Details will be announced on NUCT.
- If you have any questions, please contact to the lecturer via e-mail or "Messages" of NUCT.
- If you want to exchange information among students, please use "Message" of NUCT.

### Contacting Faculty

Visiting the faculties' office or asking by e-mail.

Contact:

Ryota Tsubaki (rtsubaki(at)civil.nagoya-u.ac.jp)



Tomoaki Nakamura (tnakamura(at)nagoya-u.jp)

## Advanced Geotechnical Engineering (2.0credits) (地盤工学特論)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Autumn Semester	1 Autumn Semester
Lecturer	Toshihiro NODA Professor	Kentaro NAKAI Associate Professor

### Course Purpose

This lecture aim to learn how the basic knowledge learned in soil mechanics and geomechanics are applying to actual geoen지니어ing, and to understand its theoretical background. Specifically, the purpose is to learn about settlement and failure (bearing capacity) problems in soft ground, as well as how to deal with uncertainties in the actual field of geoen지니어ing such as the safety factor method and reliability design.

From this lecture, the goal is to be able to:

1. Understand and explain about the current status and issues of geotechnical engineering.
2. Understand the prediction method for the ultimate load using observations during construction on soft clayey ground.
3. Understand how the consolidation settlement and time can be predicted using the observational method (Asaoka method).
4. Understand the bearing capacity analysis method by RPFEM.
5. Understand the consolidation settlement prediction method based on Biot's multidimensional consolidation theory.

### Prerequisite Subjects

Soil Mechanics, Soil and Foundation Engineering, Geotechnical Engineering  
Advanced Continuum Mechanics, Advanced Work in Soil Mechanics and Geotechnical Engineering

### Course Topics

- 1Introduction to geotechnical engineering
- 2Multi-dimensional consolidation analysis
- 3Observational method for predicting consolidation settlement (Asaoka method)
- 4Mean effective stress and bearing capacity
- 5Undrained bearing capacity ( $u=0$  circular slip surface analysis)

There will be several report assignments to deepen student's understanding of the lecture.

### Textbook

Printed documents will be distributed.

### Additional Reading

References will be introduced as necessary.

### Grade Assessment

Evaluate the level of achievement for the achievement target through report assignments and final exams. A score of 60 or more out of 100 is a passing score.

### Notes

Online lectures using Zoom or TEAMS.

Please contact Prof. Nakai (nakai@civil.nagoya-u.ac.jp) if you cannot attend the lecture due to the time difference or internet connection problem.

### Contacting Faculty

Questions during and after the lecture are welcome. E-mail questions are also accepted at any time.

Toshihiro NODA, Ext: 3833, E-mail: noda@nagoya-u.jp, Bldg. 9 Rm. 317



Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Autumn Semester	1 Autumn Semester
Lecturer	Takayuki MORIKAWA Professor	Toshiyuki YAMAMOTO Professor

### Course Purpose

Understand the meanings and objectives of infrastructure and learn the infrastructure planning methods. The goals of the class are to be able to explain the public economy, and solve the problems to derive the appropriate results by applying the evaluation methods and decision methods considering the uncertainty.

### Prerequisite Subjects

Infrastructure Planning

### Course Topics

1. Public economics 1 (social welfare and Pareto optimum)
2. Public economics 2 (consumer's behavior and demand curve)
3. Public economics 3 (producer's behavior and market equilibrium)
4. Public economics 4 (market failure)
5. Public economics 5 (externality)
6. Public economics 6 (public goods 1)
7. Public economics 7 (public goods 2)
8. Introduction to decision making in infrastructure planning
9. Evaluation and decision making 1 (cost-benefit analysis and value of non-market goods)
10. Evaluation and decision making 2 (evaluation methods of non-market goods and utility function)
11. Evaluation and decision making 3 (value of travel time saving and project evaluation)
12. Evaluation and decision making 4 (social welfare function and analytic hierarchy process)
13. Decision making under uncertainty 1 (expected utility theory)
14. Decision making under uncertainty 2 (Bayesian decision making and value of information)
15. Decision making under uncertainty 3 (game theory and dilemma problem)

Prepare for the class beforehand and understand the meanings of technical terms.

### Textbook

Materials are provided at classes.  
The materials must be downloaded.

### Additional Reading

Introduced according to the process of the lecture.

### Grade Assessment

Examination and report (it may be changed) on public economy and evaluation and decision making on public investment including uncertainty. 60 of 100 points are required to pass

### Notes

Not required.  
Class is conducted through online as on-demand and using Teams or Zoom.  
URL is informed through NUCT [Announcements].

### Contacting Faculty

Ask questions in the class. There are no fixed schedules for office hour. Make an appointment by e-mail or tel.  
Morikawa: tel 3564, email morikawa@nagoya-u.jp



## Sustainable City Studies (2.0credits) (サステナブル都市学)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Spring Semester
Lecturer	Hiroki tanikawa Professor	Heinz Schandl Visiting Professor

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### Course Purpose

Students will learn policies and plans and technological and institutional measures to realize low carbon cities with a view to integrating climatic change mitigation in urban development.

### Prerequisite Subjects

Environmental Systems Analysis and Planning

### Course Topics

1. Global Climatic System
2. Mechanisms of Global Warming
3. Climatic Change and Human History
4. Economy, Energy and Environment and IPCC AR:
5. Industrial Ecology, Circular economy
6. Human Activities and Energy in Cities:
7. Urban Forms, Land Use and Energy:
8. Material and Energy metabolism in cities
9. Material and Energy metabolism of buildings and districts
10. Sound Material Cycle Society, Circular Economy
11. Metal resource and sustainability
12. Stock-type Society and sustainability
13. Infrastructure and Climate Change Adaptation
14. Discussion 1
15. Discussion 2

There are additional overtime studies regarding each lecture.

### Textbook

to be distributed in class

### Additional Reading

to be distributed in class

### Grade Assessment

Evaluation is carried out by reports. Each report should be written based on understanding the contents of each class. Each report will be evaluated by each lecturer. Students with over 60 points out of 100 points will be passed. All classes are in English.

### Notes

Not designated.

### Online Lecture

Out of class, students can ask questions by the "message" function of NUCT.  
the opinion exchange between students will be done by the "message" function of NUCT.

### Contacting Faculty

Contact to Prof.Tanikawa

Email tanikawa@nagoya-u.jp

## Advanced Numerical Analysis (2.0credits) (数值解析特論)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	1 Spring Semester	1 Spring Semester	
Lecturer	Tomio MIWA Associate Professor NISHIGUCHI Koji Lecturer	Kentaro NAKAI Associate Professor	Tomoaki NAKAMURA Associate Professor

### Course Purpose

It is important to acquire an advanced knowledge of numerical analysis and skills for utilizing it. This course provides basic theories of numerical analyzing techniques which are often used in the civil engineering field. The goal is to understand and apply numerical optimization method, finite element method, approximate analysis of ordinary differential equation and finite difference method for computational fluid dynamics simulation through the lecture and practical work.

### Prerequisite Subjects

Since the lectures in this course are based on the fundamental knowledge on mathematics and information processing, no background course is specified.

### Course Topics

1. Finite element method
2. Optimization problem
3. Finite difference method
4. Approximate analysis of ordinary differential equation

Reports will be assigned by each lecturer.

### Textbook

Lecture materials will be provided.

### Additional Reading

Reference book is introduced as needed.

### Grade Assessment

Knowledge and skill of basic theories of numerical analyzing techniques obtained through the course will be evaluated by reports. If the fundamental knowledge is acquired and the data can be analyzed properly, the credit is earned. Higher score will be given as higher knowledge and skills are acquired.

### Notes

Not required.

Classes will be conducted remotely (online) and will use Teams or Zoom.

Details will be explained at the time of the first lecture.

### Contacting Faculty

Asking by e-mail or message function of NUCT.

Contact:

Kentaro Nakai (nakai@civil.nagoya-u.ac.jp)

Koji Nishiguchi (kojinishiguchi@civil.nagoya-u.ac.jp)

Tomoaki Nakamura (tnakamura@nagoya-u.jp)

Tomio Miwa (miwa@nagoya-u.jp)

## Advanced Steel Structures (2.0credits) (鋼構造工学特論)

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Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Spring Semester
Lecturer	KazuoTATEISHI Professor	

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### Course Purpose

Deterioration and its prediction method for steel structures are lectured. The goals of this course are to understand the following issues,

- 1)importance of maintenance of infrastructures.
- 2)deterioration in steel structures.
- 3)calculation method for remaining life of steel members based on fracture mechanics.
- 4)fatigue and corrosion in steel members.
- 5)inspection method for steel structures.

### Prerequisite Subjects

Advanced Course in Lifecycle Design of Civil Structures  
Advanced Concrete Structures  
Exercise in Inspection of Civil Structures

### Course Topics

- 1)Importance of maintenance and difficulties.
- 2)Experiences of damage in steel structures and repair/retrofitting methods.
- 3)Fatigue and preventing method.
- 4)Linear fracture mechanics and its application.
- 5)Corrosion and preventing method.
- 6)Inspection method for steel structures.

Students are requested to read the handouts before each class.

### Textbook

Handouts will be delivered.

### Additional Reading

Reference books will be determined by the lecturer.

### Grade Assessment

Passing score is 60% or more. The score is evaluated by reports on each goals.

### Notes

No prerequisite.

The classes are held in face-to-face style.

### Contacting Faculty

Students are encouraged to ask questions anytime.



## Advanced Concrete Structures (2.0credits) (コンクリート構造工学特論)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Spring Semester
Lecturer	Hikaru NAKAMURA Professor	Taito Miura Associate Professor

### Course Purpose

The objective is to learn advanced knowledge of the design, construction and maintenance of concrete structures, to acquire applied skills that make use of the knowledge in practice.

After completing this class, students will be able to:

1. Confirm basic knowledge of RC structures
2. Understand nonlinear analysis of concrete
3. Understand time dependent behavior of concrete
4. Understand construction for quality control

### Prerequisite Subjects

Advanced Structural Mechanics, Advanced Course in Lifecycle Design of Civil Structures, Exercise in Inspection of Civil Structures, Advanced Numerical Analysis

### Course Topics

1. Basic knowledge of design of concrete structures
2. Outline of nonlinear structural analysis for concrete structures
3. Outline of diffusion analysis for concrete structures
4. Volume change and cracking of concrete
5. Quality control of concrete
6. Proposal of design and construction concepts for Quality control

Before class, please prepare next class to understand basic part. After class, the assignments must be completed and submitted by the deadline.

### Textbook

Prints are distributed

### Additional Reading

Reference books will be recommended at the right time

### Grade Assessment

(Assessment method) 60% or more are accepted by the result of midterm exam (50%) and final exam (50%).

(Assessment criteria)

Acceptance criteria are to be able to understand the nonlinear analysis of concrete, time dependent behavior of concrete, construction for quality control, and to be able to make report and presentation.

### Notes

\*No course requirements are required.

\*This lecture is planning to consist of online (Zoom) and face to face lectures. The detail information and schedule will be informed through NUCT.

Students who have a question on this class can contact to Hikaru Nakmaura ([hikaru\(at\)cc.nagoya-u.ac.jp](mailto:hikaru(at)cc.nagoya-u.ac.jp)).

Contacting Faculty

Welcome to come to room directly anytime and question by e-mail hikaru(at)cc.nagoya-u.ac.jp

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Spring Semester
Lecturer	Yuji Toda Professor	

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### Course Purpose

aim of this class: to obtain the comprehensive understanding of the theoretical background and the recent technologies for river and river basin management.

The attainment target is to get the fundamental knowledge of river basin managements and to acquire the understanding of new technologies of river engineering and fluvial hydraulics

### Prerequisite Subjects

Hydrology and river engineering, open channel hydraulics

### Course Topics

1. Outline of river and river basin management
2. Sediment Transport
3. Fluvial Hydraulics
4. Eco-Hydraulics

to check the achievements, several assignments will be give in the class

### Textbook

Reference materials are distributed

### Additional Reading

Reference materials are distributed

### Grade Assessment

Report: 100%. The criterion for passing is to understand the basic understanding of the river management and river flow analysis.

### Notes

No requirement for registration of the class (The completion of Hydrology and river engineering, open channel hydraulics are highly recommended).

The class will be provided by on-line (online soft: Zoom).

The announcement and the PPT slides of the class will be distributed by NUCT.

### Contacting Faculty

Questions after the class or via e-mail are welcome

E-mail: ytoda###cc.nagoya-u.ac.jp

(replace ### with @)

## Advanced Mechanics of Geomaterials (2.0credits) (地盤材料力学特論)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Spring Semester
Lecturer	Masaki NAKANO Professor	

### Course Purpose

The aim of this course is to acquire the basics and applications of geomaterials mechanics for safely constructing and maintaining various geotechnical structures. Concretely, this course introduces the mechanical behavior of remolded clay and natural deposited clay, and the difference between the two. Then, the course also introduces the basics of plastic mechanics, an elasto-plastic constitutive model, and the mechanical behavior of remolded clay and naturally deposited clay based on the constitutive model. In addition, the object is expanded to sand, problematic soil, and improved soil, and their mechanical behavior is also explained based on elasto-plastic mechanics. In addition, in the design of the geotechnical structure, the advantages and disadvantages of each are compared by comparing the current design method and the approach using the elasto-plastic constitutive model.

The goals of this course are to

1. Explain the water-soil coupled mechanical behavior of artificial clay and natural deposited clay.
2. Learn the basics of plastic mechanics and apply it to geotechnical materials.
3. Understand the derivation of the elasto-plastic constitutive model for the geotechnical material and its characteristics, and explain the mechanical behavior of the ground based on the constitutive model.
4. Understand the difference between the current design method and the approach using the elasto-plastic constitutive model in the design of the ground structure, and explain the advantages and disadvantages of each.

### Prerequisite Subjects

Advanced Continuum Mechanics, Advanced Numerical Analysis

### Course Topics

1. Stress and strain

Learning mainly stress tensors, strain tensors, and the meaning of elements in the expression matrix.

2. Elastic construction type

Learning mainly the characteristics of elastic bodies, and Hooke's law.

3. Introduction to elasto-plastic constitutive equation

Learning mainly the basic assumptions and the general form of the elastic constitutive equation, and its application to Mises materials.

4. Elasto-plastic constitutive equation of soil

Learning mainly the Cam-clay model, the Subloading yield surface Cam-clay model and the Super/Subloading yield surface Cam-clay model.

5. Design method of ground structure: Current design method and elasto-plastic constitutive model approach

Learning mainly the outline of the current design method, bearing capacity analysis, and settlement / deformation analysis.

After the class, you should review the distributed prints. In addition, you will be required to submit a report task several times.

### Textbook

The slides and prints prepared by the instructor will be distributed as materials.

### Additional Reading

Atkinson, J. H. and Bransby, P.L. : The mechanics of soils- An Introduction to Critical State Soil Mechanics-,McGRAW-HILL Book, (1978)

NAKANO, M.: Geotechnical mechanics, CORONA PUBLISHING CO., LTD.

References will be introduced as needed.

#### Grade Assessment

The degree of achievement of goals is comprehensively evaluated by a report (30%), a final exam (70%). Acceptance criteria are to be able to understand the basics of plastic mechanics and applied it to the geotechnical material, derived the elasto-plastic constitutive model for the geotechnical material and understood its characteristics, and understood the differences between the current design method and the interpretation approach using the elasto-plastic co

#### Notes

No course requirements are required.

Lecture is held by ONLINE by using Zoom or Teams.

Ask questions to lecturer using E-mail.

Exchange opinions between students regarding the class using the NUCT function "Message".

#### Contacting Faculty

Welcome questions during and after this seminar. Each member also accepts questions at the room and by e-mail at any time.

Masaki NAKANO: Ex.4622, nakano(at)civil.nagoya-u.ac.jp

## Advanced Traffic Engineering and Management (2.0credits) (交通工学特論)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Spring Semester
Lecturer	Hideki NAKAMURA Professor	

### Course Purpose

There is no doubt that a considerable portion of pollution emissions is resulted from transportation related activities and vehicular movements in particular. Managing traffic safely and efficiently is one of the most effective solutions to relieve environmental issues worldwide. Training specialists who have the knowledge and skills of traffic engineering is highly demanded especially in developing countries where travel demand is rapidly increasing despite insufficient transportation infrastructure. In this course, fundamentals and internationally forefront issues in traffic engineering are to be covered in theory and practice, so that students can effectively master the most important issues for practicing in highway planning and traffic operations.

### Prerequisite Subjects

History of City and Civilization, Human Activities and the Environment, Probability and Statistics, Urban and National Land Planning

### Course Topics

1.INTRODUCTION TO TRAFFIC ENGINEERING AND ITS SCOPE 2.TRAFFIC SURVEYS  
3.MACROSCOPIC TRAFFIC CHARACTERISTICS 4.MICROSCOPIC TRAFFIC CHARACTERISTICS  
5.CAPACITY ANALYSIS AND BREAKDOWN PHENOMENA 6.HIGHWAY PLANNING AND  
LEVEL OF SERVICE 7.INTERSECTION DESIGN 8. TRAFFIC SIGNAL CONTROL 9.TRAFFIC  
MANAGEMENT AND APPLICATION OF EMERGING TECHNOLOGIES. Reviewing contents of the  
class after class hours and preparation of reports for assignments are requested.

### Textbook

Suggested according to the progress of the class.

### Additional Reading

- Elefteriadou, L.: "An Introduction to Traffic Flow Theory", Springer, 2014.
- Transportation Research Board, Special Report 209, "Highway Capacity Manual", National Research Council, Washington, D.C., 2016.

### Grade Assessment

Evaluated through the result of a term-end exam or submitted reports. Over 59/100 is necessary to pass.

### Notes

No requirements.

Classes are held by combining in-person and online. For online classes, Zoom or Teams will be used.

### Contacting Faculty

Questions are welcome in the class.

Email: nakamura(at)genv.nagoya-u.ac.jp

## Advanced Urban Planning (2.0credits) (都市計画特論)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Spring Semester
Lecturer	Hirokazu KATO Professor	

### Course Purpose

In the state of the aging and declining population, global environmental issues and catastrophic natural disasters, you explore desired urban planning and required economic and financial systems to support it.

The goals by learning this lecture is as follows:

1. To learn and explain the necessity of urban planning and its basic items and requirements.
2. To understand and explain the contents, problems and reasons for Japanese spatial planning.
3. To understand and explain the direction of spatial planning in Japan and developing countries in the future.

### Prerequisite Subjects

Infrastructure Planing, Transport Planning, Urban and National Land Planning

### Course Topics

- 1 "The city will not survive without any action"  
Various restrictions and the direction required for urban management under them
- 2 "What kind of problem is happening in the city?"  
Economics / financial approach to the relationship between urban activities and various problems
- 3 "Is urban growth bad?"  
Effects of motorization and lifestyle changes associated with urban growth
- 4 "Can we analyze various urban problems with existing tools?"  
How to apply transport systems and urban analysis methods to environmental issues
- 5 "What is urban policy in 21st century? What should I do?"  
Environmentally-friendly and sustainable urban and transport planning
- 6 Final presentation: Report on a survey about sustainable region and city

For foreign students (including NUGELP program) who cannot understand Japanese, special program is prepared. Seminar of urban structure, planning and environment and lecture of Nagoya's urban planning. Detail contents will be explained in the first class. To attend is the duty.

### Textbook

Textbooks are not specified, but lecture materials will be distributed as appropriate

### Additional Reading

Reference materials are not specified, but they will be distributed as appropriate

### Grade Assessment

Reports(30%) and Presentation(70%)

Passed applicants must understand and explain the ideal way of urban planning to form a sustainable city.

<Entered after 2020>

95-100: A+

80-94: A

70-79: B

65-69: C

60-64: C-

-59: F

<Entered before 2019>

90-100: S

80-89: A

70-79: B

60-69: C

-59: F

#### Notes

No requirement

Face-to-face and remote. If there is a change in the class form, etc. after registration, we will guide you on the NUCT class site.

#### Contacting Faculty

Please use message function of NUCT.

\* If impossible to use NUCT:

Mail to [kato@genv.nagoya-u.ac.jp](mailto:kato@genv.nagoya-u.ac.jp)



## Conservation and Ecotoxicology of Soil and Water (2.0credits) (土水環境保全学特論)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Spring Semester
Lecturer	ArataKATAYAMA Professor	

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### Course Purpose

The class aims to understand the basics on the remediation of contaminated soil and water through the lecture on the outbreak of pollution, environmental standards, exposure to the organisms, toxicity and environmental fates of pollutants, effect on the ecosystem, remediation technologies of soil and water, and waste treatment technologies. A lecture-style class.

Individual students are requested to be able to (1) understand and explain the behavior of chemicals in the soil and groundwater pollution (sorption, migration, metabolism and degradation) and (2) to understand the toxicity and fate of chemicals in the organisms and in the environment and to explain the effects of chemicals.

### Prerequisite Subjects

Environmental geotechnology, microbiology, chemistry, sanitary engineering, toxicology, mathematics, soil science, hydrology

### Course Topics

The lecture is carried out on the basics on environmental standards, properties and toxicity of chemicals causing pollution in soil and water, interaction (exposure, metabolism and degradation) of chemicals with organisms (mammals, plants, microorganisms), fate of chemicals in the environment, effect on the ecosystem, prediction of behavior of pollutants and remediation technologies of contaminated soil and water.

The students will be given assignments and requested to solve and submit them as reports. The students themselves are expected to find the appropriate references and to obtain the comprehensive understanding the issues.

### Textbook

Handouts in relation to the topics will be distributed.

### Additional Reading

Vaccari DA, Strom PF, Alleman JE, "Environmental Biology for Engineers and Scientists" John Wiley & Sons, Inc. Hoboken, New Jersey, USA (2006)

Moriarty F, "Ecotoxicology (2nd ed.)" Academic Press, London (1988)

Connell DW, Miller GJ "Chemistry and ecotoxicology of pollution" John Wiley & Sons, Inc. New York, USA (1984)

Alvarez PJJ, Illman WA "Bioremediation and Natural Attenuation" John Wiley & Sons, Inc. Hoboken, New Jersey, USA (2006)

### Grade Assessment

Homework is given to the students every week. The evaluation is carried out based on the weekly reports submitted. Higher than 60 points in 100 as full mark is passed.

The grade evaluation is carried out based on the accuracy in the answers to the assignments by finding the appropriate references.

### Notes

The lecture will be carried out in face-to-face style. However, depending on the situation of COVID-19, the lecture may be changed to online class using Zoom or Teams. The details will be announced in NUCT.

## Conservation and Ecotoxicology of Soil and Water (2.0credits) (土水環境保全学特論)

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Because of multidisciplinary field, there is no textbook that covers all the issues in this class. The students are encouraged to reach the understanding of the relations among the issues lectured.

### Contacting Faculty

After the class

or

individual appointment (appointed time/date by phone/email)

## Environmental System Analysis and Planning (2.0credits) (環境社会システム工学)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Lecture		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	1 Spring Semester	1 Spring Semester	
Lecturer	Hiroki tanikawa Professor	Tsuyoshi FUJITA Visiting Professor	Keisuke NANSAI Visiting Professor

### Course Purpose

Students will understand "environmental systems" which link Environment and Human Activities listed as below,

- 1.the interaction of human activities and nature
- 2.the scientific mechanisms of global environmental problems, such as climatic change.
- 3.the basic principles and methods of analyzing environmental systems, e.g., environmental economics, mathematical models, life-cycle assessment, etc.
4. the principles and methods of environmental management at local, national and global scales.

### Prerequisite Subjects

Low Carbon City Studies

### Course Topics

1. About Environmental System Analysis
- 2-3. Carrying Capacity, Water, Energy, Material Flow/Stock
- 4-6. Simple Global Warming modeling
- 7-9. Industrial Symbiosis modeling
- 10-12. The basis on Input and Output Analysis
- 13-14. Urban Climate Modeling
- 15 Discussion

There are additional overtime studies regarding each lecture.

### Textbook

to be distributed in class

### Additional Reading

to be distributed in class

### Grade Assessment

Evaluation is carried out by reports. Each report should be written based on understanding the contents of each class. Each report will be evaluated by each lecturer. Students with over 60 points out of 100 points will be passed. All classes are in English.

### Notes

Not designated.

### Online Lecture

Out of class, students can ask questions by the "message" function of NUCT.  
the opinion exchange between students will be done by the "message" function of NUCT.

### Contacting Faculty

tanikawa@nagoya-u.jp

## Advanced Continuum Mechanics (2.0credits) (連続体力学特論)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Spring Semester
Lecturer	Toshihiro NODA Professor	Masaki NAKANO Professor

### Course Purpose

The aims of this course are to review the concept of vector/tensor and to understand the basics of continuum mechanics such as kinematics (geometry of motion), equilibrium rules, and objectivity.

Through this course, students will be able to:

1. Understand and explain the basis of Vector and Tensor Analysis.
2. Explain material and spatial descriptions of the physical value of body, material/spatial time derivatives and expression of deformation of body using tensor,
3. Understand and explain properties of Cauchy's stress tensor, and
4. Understand and explain basic law of mechanics and Cauchy's first/second law of motion, and apply them to the interpretation and representation of the mechanical behavior of continuum body.

### Prerequisite Subjects

Calculus, vector analysis, structural mechanics, hydraulics, soil mechanics

### Course Topics

1. Definition of continuum body and outline of continuum mechanics
2. Basis of vector and tensor Analysis
3. Understanding of materials and laws of motion
4. Description of motion and deformation
5. Law of motion and stress tensor
6. Basic equations of continuum mechanics
7. Compatibility condition of displacement (rate) and strain (rate)
8. Constitutive equation and objectivity
9. Description of deformation of continuum based on finite deformation theory

Homework will be assigned after the lecture and should be submitted as a report by the next lecture.

In addition, it is necessary to prepare for the next class and understand the meaning of technical terms. Also, there will be several report assignments to deepen student's understanding of the lecture.

### Textbook

Handouts will be distributed as necessary.

### Additional Reading

Gurtin, M.E.(1981)An introduction to continuum mechanics, Academic press

Tamura, T.(2000): Introduction to continuum mechanics, Asakura press

JSCE(1989): Civil Engineering Handbook, Chapter 6, Solid Mechanics etc.

Hashiguchi, K.(1990): Latest elasto-plasticity, Asakura press

Other reference books deemed necessary will be given during the course.

### Grade Assessment

The weight of evaluation for the achievement target is equivalent and appropriate understanding of basic concepts and terminology is a criterion for passing.

Evaluate the level of achievement with the final exam 70% and the assignment report 30%. A score of 60 or more out of 100 is a passing score.

### Notes

Not required.

In principle, this lecture will be provided online using Zoom or Microsoft Teams.

### Contacting Faculty

Contact information:

Toshihiro NODA, Ex:3833, E-mail:noda(at)nagoya-u.jp

Masaki NAKANO, Ex:4622, E-mail:nakano(at)civil.nagoya-u.ac.jp

- Replace (at) with @.

## Advanced Structural Mechanics (2.0credits) (構造力学特論)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Autumn Semester	1 Autumn Semester
Lecturer	Junji KATO Professor	NISHIGUCHI Koji Lecturer

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### Course Purpose

To learn the basic knowledge of nonlinear computational mechanics and topology optimization for advanced and numerical structural design.

Performance targets:

- 1) To understand the finite element method and nonlinear structural analysis
- 2) To understand the concept of topology optimization

### Prerequisite Subjects

Computational mechanics, Finite element method

### Course Topics

1. Nonlinear computational mechanics based on the finite element method
  - Newton-Raphson method
  - Geometric nonlinear structural analysis
  - Basis of numerical instability problem
2. Topology optimization
  - Foundation of mathematics of optimization
  - Formulation of sensitivity analysis

Several reports will be given in the class.

### Textbook

Handouts will be distributed in the lecture via NUCT.

### Additional Reading

Reference books are introduced in the first lecture.

### Grade Assessment

Required to understand the basic solution of nonlinear structural analysis. The goal attainment level is evaluated by both reports (50%) and attendance (50%). 60 points or more are accepted for 100 full marks.

### Notes

No special requirement is necessary.

Class embodiments and tools used:

- The lecture is interactive online classes using Zoom and on-demand using NUCT.
- In the case of on-demand, the NUCT function "message" accepts questions to the lecturer and exchanges opinions among students.

### Contacting Faculty

Visiting our laboratory or e-mail for questions are welcome.

The lecturer at the counter: Prof. J. Kato, [junjikato\(at\)nagoya-u.jp](mailto:junjikato@nagoya-u.jp)

Replace (at) with @ when you e-mail.

## Advanced Coastal and Offshore Engineering (2.0credits) (海工学特論)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Autumn Semester	1 Autumn Semester
Lecturer	norimi mizutani Professor	Tomoaki NAKAMURA Associate Professor

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### Course Purpose

The aim of this course is to understand wave dynamics in a coastal zone and wave-structure interactions.

Course objectives:

Students will be able to

1. understand and explain hydraulic phenomena related to the radiation stress
2. understand and explain diffraction problems
3. understand and explain wave dynamics including evanescent waves
4. understand and explain the dynamic behavior of floating bodies

### Prerequisite Subjects

Advanced Fluvial and Coastal Hydrodynamics

### Course Topics

1. Radiation stress and wave dynamics in a shallow water
2. Diffraction wave theory (vertical cylinder, axisymmetric structure)
3. Dynamic behavior of floating bodies
4. Potential and the boundary element method
5. Green function and numerical methods

Students are required to review their notes and handouts after the lecture.

### Textbook

Printed documents as needed

### Additional Reading

Coastal Engineering - Wave, Beaches, Wave-Structure Interactions: T. Sawaragi, Elsevier

### Grade Assessment

Your final grade will be calculated according to the final exam or reports. To pass, students must understand the basics of the characteristics of wave fields and wave-structure interaction.

### Notes

No prerequisite.

### Contacting Faculty

Norimi Mizutani (ext. 4630, mizutani@civil.nagoya-u.ac.jp)

Tomoaki Nakamura (ext. 4632, tnakamura@nagoya-u.jp)

## Advanced Soil Dynamics (2.0credits) (地盤動力学特論)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Autumn Semester	1 Autumn Semester
Lecturer	Toshihiro NODA Professor	Kentaro NAKAI Associate Professor

### Course Purpose

In this lecture, students will know the seismic damage example such as liquefaction during the actual earthquake and will learn the basic matters and advanced contents related to the ground dynamics, such as the cyclic response of the ground during the earthquake.

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

1. Understand seismic damage caused by recent earthquakes.
2. Understand the concept of seismic design.
3. Understand the vibration mechanism of the mass / mass system.
4. Understand the double reflection theory.
5. Understand how to understand dynamic problems of water-soil two-phase system based on mixture theory.

### Prerequisite Subjects

Advanced Continuum Mechanics, Advanced Work in Soil Mechanics and Geotechnical Engineering

### Course Topics

1. Seismic damage at the time of earthquake
2. Vibration mechanism of single-mass / multi-mass system
3. Vibration mechanism of (one-phase one-dimensional) continuum (elastic)
4. Basics of Fourier analysis
5. Basics of continuum mechanics
6. Dynamic problems of soil-water coupled system (mixture theory, governing equations, etc.)

There will be several report assignments to deepen student's understanding of the lecture.

### Textbook

Printed documents will be distributed.

### Additional Reading

Introduction to continuum mechanics (by Tamura Takeshi, Asakura Shoten)

Geotechnical Handbook (Japan Geotechnical Society)

### Grade Assessment

Evaluate the degree of achievement for the achievement target by the report assignment and final examination. A score of 60 or more out of 100 is a passing score.

### Notes

Online lectures using Zoom or TEAMS.

Please contact Prof. Nakai (nakai@civil.nagoya-u.ac.jp) if you cannot attend the lecture due to the time difference or internet connection problem.

### Contacting Faculty

Questions during and after the lecture are welcome. E-mail questions are also accepted at any time.

Toshihiro NODA, Ext: 3833, E-mail: noda@nagoya-u.jp, Bldg. 9 Rm. 317

Kentaro NAKAI, Ext: 5203, E-mail: nakai@civil.nagoya-u.ac.jp, Bldg. 9 Rm. 313



## Water and Waste Engineering (2.0credits) (水・廃棄物工学)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Autumn Semester
Lecturer	NagahisaHIRAYAMA Associate Professor	

### Course Purpose

Water pollution and solid waste are some of the major environmental problems facing our society today. In this class we will learn about various technologies and measures applied in drinking water supply, control of pollution of water bodies, and solid waste management. The objectives of this class are the followings:

1. To understand the outline of water supply engineering, wastewater engineering, waste management.
2. To grasp the cutting-edge research activities in the field of emergency environmental engineering.
3. To study a solution for sustainable society.

### Prerequisite Subjects

Sanitary Engineering, Environmental Systems Analysis and Planning, Environmental Engineering

### Course Topics

This class will be conducted on hybrid class, face-to-face class or zoom system.

1. Introduction & Guidance
2. Risk management & drinking water quality risk management
3. Water supply system in Japan
4. Water safety plan
5. Water quality risk management in emergency
6. Disaster resilience and water system
7. Wastewater treatment system in Japan
8. Watershed water quality management & recovery of clean water
9. Natural disaster & water system
10. Solid waste management system in Japan
11. Solid waste treatment & recycling technology
12. Disaster debris management
13. Emergency environmental management
14. Presentation 1
15. Presentation 2

Students are required to review the paper which will be introduced in class and to develop the presentation material.

### Textbook

Handouts

### Additional Reading

Will be introduced in class.

### Grade Assessment

Participation 45%, Presentation 25%, and Report 30%. We evaluate the appropriate understanding of water supply engineering, wastewater management engineering, and waste management.

60% or more are accepted.

### Notes

No condition for registration of this course

### Contacting Faculty

E. hirayama.nagahisa@nagoya-u.jp

T. 052-747-6824

U. <https://hirayamalab.com/lecture/>

Disaster Mitigation Research Building, Rm 306

## Climate Change and Infrastructure (2.0credits) (気候変動と社会基盤)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	Autumn Semester ,every other year	1 Autumn Semester
Lecturer	Miho IRYO(ASANO) Associate Professor	

### Course Purpose

This lecture aims to acquire the knowledge about the current status and risks of climate change and international initiatives, and to develop the capacity to consider mitigation and adaptation measures from the perspective of sustainable infrastructure development.

The objective of this lecture is to acquire the following knowledge and skills.

1. Understand and explain the meaning and scientific basis of climate change.
2. Understand the risks associated with climate change, mitigation and adaptation measures, and discuss proposals for specific measures and systems.
3. Understand the United Nations Framework Convention on Climate Change and the international system and explain current issues.

### Prerequisite Subjects

Low Carbon Cities Studies

Students who have not taken it can also take this course.

### Course Topics

1. Scientific basis of climate change and its impact on social systems  
Learn about climate change and its impact on social systems based on IPCC reports.
2. Climate change mitigation and adaptation  
Through group work, learn how to analyze the potential regional risks of climate change and propose mitigation and adaptation measures.
3. International efforts to mitigate and adapt to climate change  
Learn the historical background of international climate change measures under the Framework Convention on Climate Change, and deepen your understanding of the international decision-making process.

All classes will be conducted in English. In group work, collect materials and organize presentation materials for issues indicated in advance. In addition, you will be required to submit report assignments several times.

### Textbook

Handouts will be distributed at each class.

### Additional Reading

UNFCCC website: <http://unfccc.int/2860.php>

IPCC website: <http://www.ipcc.ch/>

IPCC (2014). IPCC Fifth Assessment Report: Climate Change 2014 (AR5),  
<http://ipcc.ch/report/ar5/index.shtml>

Other references will be introduced as needed.

### Grade Assessment

Evaluation is based on presentation (50%) and report assignment (50%). As conditions for passing, students must be able to understand the risks of climate change, propose mitigation and adaptation measures based on logical examination, and understand the issues of international negotiations.

### Notes

- No course conditions are imposed.
- The course will be held hybrid style at classroom and online by Zoom. Detailed information will be given via NUCT.

### Contacting Faculty

If you have any questions, please ask the instructor by e-mail ([iryu@nagoya-u.ac.jp](mailto:iryu@nagoya-u.ac.jp)) or make an appointment by e-mail before coming to the room.

## Environmental Industry Systems (2.0credits) (環境産業システム論)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Autumn Semester	1 Autumn Semester
Lecturer	Hiroki tanikawa Professor	Miho IRYO(ASANO) Associate Professor

### Course Purpose

The student will learn the purpose of this course is to acquire practical skills as a leader in developing infrastructure by learning examples of how to apply the expertise and engineering techniques related to environmental conservation activities and technologies to the real world.

The objective of this lecture is to acquire the following knowledge and skills.

1. Understand examples of environmental conservation activities and environmental technologies.
2. Be able to consider and explain in a large theoretical framework how the above examples relate to the content taken in related subjects.

### Prerequisite Subjects

Low Carbon Cities Studies

### Course Topics

In this class, lecturers are invited from companies mainly in the Chubu region, which has an advantage in environmental conservation activities and environmental technologies, for lectures on the latest environmental initiatives in business.

#### 1. Lectures by companies and discussions

Listen to lectures on application examples of environmental conservation activities and environmental technologies from companies and discuss their contents. The list of the companies in 2020 was as below. The lecturers may vary from year to year.

- United Nations Centre for Regional Development
- CTI Engineering Co. Ltd.
- Central Nippon Expressway (NEXCO CENTRAL)
- Brother Industries, Ltd.
- MAKITA
- TOSHIBA
- JICA
- TOYOTA

#### 2. Group presentations

Based on the contents of the lectures and the contents learned in other subjects, a group discussion will be held on the connection between theory and practice, and the results will be presented.

All classes will be conducted in English. After each lecture, students will be asked to submit a reaction paper on the content of the lecture. For group presentations, collect materials and prepare presentation materials outside of class hours.

### Textbook

Handouts will be distributed at each class.

### Additional Reading

Reference literature will be introduced as needed.

### Grade Assessment

Evaluation is based on contributions to group presentations and discussions. Requirements to pass are to be able to understand the examples of environmental conservation activities and environmental technologies, and to be able to logically explain the relationship between theory and practice.

Student will fail if the class attendance rate is less than 80%.

### Notes

- No course conditions are imposed.
- It is preferable to take the designated courses of international programs (Forefront program and NUGELP) conducted by the Department of Civil and Environmental Engineering, such as Sustainable City Studies, but students who have not taken these courses can also take the course.
- This course will be held by the combination of online (Zoom) and on-site. The detailed information will be given via NUCT.

Out of class, students can ask questions by the "message" function of NUCT.

the opinion exchange between students will be done by the "message" function of NUCT.

### Contacting Faculty

If you have any questions, please ask the instructor by e-mail ([iryo@nagoya-u.ac.jp](mailto:iryo@nagoya-u.ac.jp)) or make an appointment by e-mail before coming to the room.

## Environmental Urban Systems (2.0credits) (環境都市システム論)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Autumn Semester	1 Autumn Semester
Lecturer	Miho IRYO(ASANO) Associate Professor	

### Course Purpose

The aim is to deepen the understanding of the technical and institutional systems required to build an environmental city, mainly from the perspective of city planning and transportation planning.

The objective of this lecture is to acquire the following knowledge and skills.

1. Understand and explain the impact of city structure and transportation on the environment.
2. Be able to analyze the urban and transportation issues for specific cities and propose plans to build an eco-city.

### Prerequisite Subjects

Low Carbon Cities Studies

Students who have not taken it can also take this course.

### Course Topics

1. Components of urban environment and their issues
2. Historical review of city structures and location theory
3. Observation and assessment of environmental impact
4. Urban / transportation plan for environmental improvement
5. Consensus building and community development
6. Case studies of environmental improvement measures in various cities

All classes will be conducted in English. In case studies, collect materials and arrange presentation materials for issues indicated in advance. In addition, you will be required to submit report assignments several times.

### Textbook

Handouts will be distributed at each class.

### Additional Reading

References will be introduced as needed.

### Grade Assessment

Evaluation is based on report assignments (60%), and presentation and discussions (40%). As conditions for passing, students must be able to understand the impact of city structure and transport on the environment, and to make proposals to build an eco-city.

### Notes

- No course conditions are imposed.
- The course will be held in hybrid style at classroom and online by Zoom. Details will be given via NUCT.

### Contacting Faculty

If you have any questions, please ask the instructor by e-mail ([iryo@nagoya-u.ac.jp](mailto:iryo@nagoya-u.ac.jp)) or make an appointment by e-mail before coming to the room.

## Transportation Systems Analysis (2.0credits) (交通システム分析)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Lecture	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Spring Semester
Lecturer	Takayuki MORIKAWA Professor	Toshiyuki YAMAMOTO Professor

### Course Purpose

To plan and evaluate efficient and sustainable transportation systems analysis, the objectives of this lecture are to learn transportation surveys, travel demand analysis, and evaluation methods of the systems. It also aims to build capacities of using them in transportation research and practices.

### Prerequisite Subjects

Statistics, Transportation Planning

### Course Topics

- 1 Morikawa Transportation demand and travel survey
- 2 Morikawa Aggregate demand model 1 – Trip generation & production/attraction
- 3 Morikawa Aggregate demand model 2 – Trip production/attraction
- 4 Morikawa Aggregate demand model 3 – Trip distribution & modal split
- 5 Morikawa Traffic assignment on network 1
- 6 Morikawa Traffic assignment on network 2
- 7 Morikawa Preview of disaggregate demand modeling
- 8 Yamamoto Disaggregate demand model 1 – Binary choice
- 9 Yamamoto Disaggregate demand model 2 – Multinomial choice
- 10 Yamamoto Disaggregate demand model 3 – Estimation and statistical test
- 11 Yamamoto Disaggregate demand model 4 – Aggregation and forecast
- 12 Yamamoto Exercise
- 13 Yamamoto Disaggregate demand model 5 – Multi-dimensional choice
- 14 Yamamoto Disaggregate demand model 5 – Advanced discrete choice models
- 15 Summary and evaluation

Prepare for the class beforehand and understand the meanings of technical terms.

### Textbook

The materials must be downloaded.

### Additional Reading

- "Modeling Travel Behavior" by Kitamura, Morikawa, Sasaki, Fujii, & Yamamoto (in Japanese)
- "Discrete Choice Analysis" by Ben-Akiva and Lerman
- "Discrete Choice Methods with Simulation" by Train

### Grade Assessment

Exam & reports on understanding approaches and methods to analyze travel behavior and demands for various transportation systems. 60 of 100 points are required to pass. (It may be changed.)

### Notes

Not required

Class is conducted through online as on-demand and using Teams or Zoom..

URL is informed through NUCT [Announcements].

### Contacting Faculty

Students can ask questions to professors at any time during classes.

Questions during off-class hours can be asked via e-mail: morikawa@nagoya-u.jp and





## Exercise in Inspection of Civil Structures (1.0credits) (インフラ検査・点検演習)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Exercise		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	1 Spring Semester	1 Spring Semester	
Lecturer	KazuoTATEISHI Professor Taito Miura Associate Professor	Hikaru NAKAMURA Professor Masaru Shimizu Assistant Professor	Takeshi HANJI Associate Professor

### Course Purpose

The purpose of this course is to learn deterioration mechanisms of concrete and steel structures and basics of bridge maintenance. Based on the knowledge learned in the course, exercise using "N2U-BRIDGE" and on site inspection of existing bridge is conducted. Furthermore, exercises on preparation of inspection reports, evaluation of deterioration degree, estimation of deterioration mechanism are carried out. After completing this course, students will be able to:

Understand and explain deterioration typically occurred in concrete and steel structures, and  
Estimate deterioration mechanisms of concrete and steel structures.

### Prerequisite Subjects

Material Engineering, Concrete Structures I, Concrete Structures II, Steel Structures, Experiments in Materials and Structures I, Experiments in Materials and Structures II

### Course Topics

Orientation

Current situation of bridges in Japan

Historical review of Japanese standards

Defects of concrete and steel structures

Estimation of deterioration mechanism of concrete and steel structures

Guideline for inspection and assessment of infrastructures

Detailed investigation (Principle of nondestructive test)

How to write the investigation worksheet

Inspection training using "N2U-BRIDGE"

Inspection using existing bridges

After lectures and on-site inspection exercises, the assignments must be completed and submitted by the deadline.

### Textbook

Handouts will be distributed in the class.

### Additional Reading

Reference books will be recommended at the right time.

### Grade Assessment

Evaluation will be comprehensively based on the result of final report, subject to attendance at all lectures. Requirements to pass are to be able to correctly understand and explain the deterioration mechanisms in both concrete and steel structures.

### Notes

No requirements.

This exercise is planning to consist of online (Zoom or Teams) lectures and on-site inspection trainings. The detail information and schedule of the exercise will be informed through NUCT.

Students who have a question on this class can contact to Takeshi HANJI (hanji(at)civil.nagoya-u.ac.jp).

Contacting Faculty

Visiting faculty's lab. or asking by e-mail.

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Exercise	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Spring Semester
Lecturer	Ryota TSUBAKI Associate Professor	

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### Course Purpose

The goal of this course is to develop applied skills for understanding and predicting hydro-morphological processes based on the fundamentals of the topics.

The objectives of this course are

1. Understand the model to estimate transport of water and other materials, and apply the model to practical problems,
2. Preview the result estimated by the model with reasonable boundary conditions, and
3. Understand the theory of aquatic biology and material transport, apply the theory to practical problems.

### Prerequisite Subjects

Fundamentals of Hydrodynamics with Exercises, Open-channel hydraulics, Hydrology and River Engineering

### Course Topics

1. Analysis of open channel flow and morphological change
2. Theory of mathematical modeling for aquatic organisms and material transport

Reading specified documents prior to the exercise is needed. Reports are asked to submit during the exercise.

### Textbook

Printed document

### Additional Reading

Directed as needed

### Grade Assessment

Report will be used for grading. To acquire standard skills and knowledge in the topic is the criteria to pass. Further application of skills and knowledge will be accounted for the grade.

### Notes

No course requirements are specified.

- The class will be given by in-person or online in the on-demand format and/or the real-time format using Teams/Zoom (will be determined based on the participants' capability). Details will be announced on NUCT.

- If you have any questions, please contact to the lecturer via e-mail or "Messages" of NUCT.

- If you want to exchange information among students, please use "Message" of NUCT.

### Contacting Faculty

Discuss during the exercise or ask by e-mail  
rtsubaki(at)civil.nagoya-u.ac.jp

## Advanced Work in Planning Methods (1.0credits) (社会基盤計画学演習)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Exercise	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Spring Semester
Lecturer	Tomio MIWA Associate Professor	

### Course Purpose

It is an important ability to utilize the knowledge gained through lectures. This course aims at learning systems analysis method on city, transportation, and regional planning. Objectives are to understand regression models, principal component analysis, discriminant analysis, and discrete choice models, and to develop an ability to apply them.

The goal of this course is to develop the ability to select an appropriate method for given data, to calculate correct results, and to interpret the results appropriately.

### Prerequisite Subjects

Desirable to have some knowledge on basic microeconomic theory, probability theory and statistics, and mathematical planning method.

### Course Topics

1. Statistical methods for data analysis
2. Regression analysis: basics
3. Regression analysis: application (specification, error term, generalized least squares)
4. Principal component analysis and Factor analysis
5. Discrete choice model: basics
6. Discrete choice model: application

Reports will be assigned at the end of each topic.

### Textbook

Lecture note will be provided.

### Additional Reading

Maddala, G.S.: Introduction to Econometrics, Macmillan Publishing Company

Ben-Akiva, M. and Lerman, S.R.: Discrete Choice Analysis, MIT Press

### Grade Assessment

If the knowledge about the numerical analysis method for city, transportation, and regional planning is acquired correctly, the credit is earned. Evaluation will be based on the report works. All reports are required to be submitted.

### Notes

There is no requirement.

Classes will be conducted remotely (online) and will use Teams or Zoom.

The recorded lecture video will be distributed by NUCT. Students who cannot take online classes should use it.

Questions about lesson content are invited. Students can ask a question through a chat system during a lecture and by email after a lecture.

Details will be explained at the time of the first lecture.

### Contacting Faculty

Student can ask a question through chat system during a lecture and by email after a lecture (e-mail: miwa@nagoya-u.jp).

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Exercise	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Autumn Semester	1 Autumn Semester
Lecturer	Junji KATO Professor	NISHIGUCHI Koji Lecturer

### Course Purpose

To learn parallel programming techniques suitable for supercomputer "Flow" or "Fugaku" for large-scale structure and fluid simulations.

Performance targets:

1. To explain the importance and role of massively parallel computing in engineering.
2. To practice parallel programming techniques on the FX1000.
3. To perform parallelization and speedup of code.

### Prerequisite Subjects

Computational mechanics, Finite element method, Finite volume method

You are advised to take Advanced Structural Mechanics course, but even if you do not take it, you can take this course.

### Course Topics

1. Introduction of high-performance computing
  - Structure analysis
  - Fluid analysis
  - Fluid-structure interaction analysis
2. Let's login supercomputer "FLOW"(): FX1000
3. Basis of OpenMP (1)
4. Basis of OpenMP (2)
5. Weak scaling and Strong scaling
6. Profiler
7. Hands-on training
  - Parallel programming using OpenMP
  - Profiling
  - Tuning

Several reports will be given in the class.

### Textbook

Handouts will be distributed during class hours.

### Additional Reading

Reference books are introduced at the first lecture.

### Grade Assessment

Required to understand the basis of parallel programming, the goal attainment level is evaluated by both report (50%) and attendance (50%). 60 points or more are accepted for 100 full marks.

### Notes

No special requirement is necessary.

Classes will be conducted remotely (online, live) and will use Zoom.

Details will be explained at the time of the first lecture.

### Contacting Faculty

Students are encouraged to ask questions in the class.

The lecturer in charge

Lecturer: Koji Nishiguchi

[https://profs.provost.nagoya-u.ac.jp/html/100011123\\_en.html](https://profs.provost.nagoya-u.ac.jp/html/100011123_en.html)

## Advanced Work in Coastal and Offshore Engineering (1.0credits) (海工学演習)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Exercise		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	1 Autumn Semester	1 Autumn Semester	
Lecturer	norimi mizutani Professor	Tomoaki NAKAMURA Associate Professor	YonghwanCHO Assistant Professor

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### Course Purpose

In this course, each group composed of two to three students will select and address an issue in coastal and ocean engineering.

Through this course, students will be able to

1. find what issues are in coastal and ocean engineering
2. come up with how to address them
3. acquire enough skills to address them by themselves

### Prerequisite Subjects

Advanced Fluvial and Coastal Hydrodynamics, Advanced Coastal and Offshore Engineering

### Course Topics

Every group will make a presentation on progress every week, and instructors and students will discuss the content of the presentation.

### Textbook

Directed as needed

### Additional Reading

Directed as needed

### Grade Assessment

Your final grade will be calculated according to the presentation. To pass, students must understand the basics of the selected issue in coastal and ocean engineering.

### Notes

No prerequisite

- The class will be given in the real-time online format using Teams and Slack.

### Contacting Faculty

Norimi Mizutani (ext. 4630, mizutani@civil.nagoya-u.ac.jp)

Tomoaki Nakamura (ext. 4632, tnakamura@nagoya-u.jp)

Yong-Hwan Cho (ext. 4634, yhcho@civil.nagoya-u.ac.jp)



## Advanced Work in Soil Mechanics and Geotechnical Engineering (1.0credits) (地盤力学総合演習)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Exercise		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	1 Autumn Semester	1 Autumn Semester	
Lecturer	Masaki NAKANO Professor	Toshihiro NODA Professor	Kentaro NAKAI Associate Professor
	SAKAITakayuki Assistant Professor	YOSHIKAWATakahiro Assistant Professor	Tomohiro TOYODA Assistant Professor

### Course Purpose

The purpose of this lecture is to review the contents learned in the Advanced Mechanics of Geomaterials and Advanced Soil Dynamics, and to work on related exercises and programming to gain a deep understanding of basic concepts.

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

1. Understand and program the elasto-plastic constitutive equations of soil skeleton (elastic-plastic description of various soil materials).
2. Understand and program dynamic ground problems.
3. Understand the theory and analysis methods for deformation and failure of the ground.

### Prerequisite Subjects

Advanced Mechanics of Geomaterials, Advanced Soil Dynamics, Advanced Continuum Mechanics, Advanced Numerical Analysis

### Course Topics

1. Understanding of the elasto-plastic constitutive equation of soils ( Mechanical behavior of various soils )
2. Understanding of the dynamic problems of the ground
3. Understanding of the theory and analysis method for the ground deformation and failure.
4. Application of finite element method to geotechnical engineering

There will be several report assignments to deepen student's understanding of the lecture.

### Textbook

Printed documents will be distributed.

### Additional Reading

References will be introduced as necessary.

### Grade Assessment

Evaluate the degree of achievement for the achievement target by the report assignment. A score of 60 or more out of 100 is a passing score.

### Notes

Online lectures using Zoom or TEAMS.

Please contact Prof. Nakai (nakai@civil.nagoya-u.ac.jp) if you cannot attend the lecture due to the time difference or internet connection problem.

### Contacting Faculty

Questions during and after the lecture are welcome. E-mail questions are also accepted at any time.

Masaki NAKANO, Ext: 4622, E-mail: nakano (at) civil.nagoya-u.ac.jp, Bldg. 9 Rm. 327

Toshihiro NODA, Ext: 3833, E-mail: noda (at) nagoya-u.jp, Bldg. 9 Rm. 317

Kentaro NAKAI, Ext: 5203, E-mail: nakai (at) civil.nagoya-u.ac.jp, Bldg. 9 Rm. 313

Takayuki SAKAI, Ext: 2734, E-mail: t-sakai (at) civil.nagoya-u.ac.jp, Bldg. 9 Rm. 327

Takahiro YOSHIKAWA Ext: 3834, E-mail: yoshikawa (at) civil.nagoya-u.ac.jp, Bldg. 9 Rm. 315

Please replace (at) with @.

## Exercise on Conservation and Ecotoxicology of Soil and Water (1.0credits) (土水環境保全学演習)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Exercise	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Autumn Semester	1 Autumn Semester
Lecturer	ArataKATAYAMA Professor	KASAI Takuya Assistant Professor

### Course Purpose

The class aims to understand the basic knowledge and techniques to carry out the research on the microbial remediation of polluted soil and groundwater, and microbial waste treatment by the exercise.

The students can learn the basic knowledge and techniques to carry out the research on the microbial remediation of polluted soil and groundwater, and microbial waste treatment by the exercise.

### Prerequisite Subjects

Environmental geotechnology, chemistry, microbiology, hydrology, soil science, conservation and ecotoxicology of soil and water

### Course Topics

The exercise is carried out on the selected topics of physico-chemical analysis of soil and water in pollution, microbial manipulation, environmental microbiology, analysis of pollutants, and analysis of mass transport in soil and groundwater.

The students are requested to read the related documents and provide the answers to the assignments prior to the class. In the class, the students are asked to present the answers and to discuss on them.

### Textbook

The textbook is introduced depending on the selected topics to exercise in the class.

### Additional Reading

Fitts CR, "Groundwater Science" Academic Press, London, UK (2002)

Fetter CW, "Contaminant Hydrology (2nd Ed.)" Waveland Press Inc. Long Grove, Illinois, USA (1999)

Madigan MT, Bender KS, Buckley DH, Sattley WM, Stahl DA, "Brock Biology of Microorganisms Global Edition", Pearson Education, Harlow, UK (2018)

### Grade Assessment

Every week, students are required to solve the problems given. Higher than 60 points in 100 as full mark is passed. The evaluation is carried out based on the correctness in the understanding of the assignments and the accuracy in the answers.

### Notes

The class is carried out by answering to the problems and the discussion, the students are requested to participate to the class unless there is the special reason.

### Contacting Faculty

The class is carried out by the student presentation of the answers to the problems and the questions in relation to the problems. Therefore, questions can be raised anytime during the class and the discussion is carried out.

## Practice in Environmental Systems Analysis and Planning (1.0credits) (環境社会システム工学演習)

Course Type	Specialized Courses		
Division at course	Master's Course		
Class Format	Exercise		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	1 Autumn Semester	1 Autumn Semester	
Lecturer	Hiroki tanikawa Professor	Kiichiro HAYASHI Professor	Hiroaki SHIRAKAWA Associate Professor

### Course Purpose

It is important for students to use "System Thinking" in the mathematic model for clarifying the relationship between the natural environment and human activity. The goal of this seminar is to understand "statistics", "spreadsheet simulation and system dynamics with using geographic information systems.

### Prerequisite Subjects

- Low Carbon Studies - Environmental System Analysis and Planning

### Course Topics

Choose and combine methods from the following and apply them to the analysis of topics that the student is interested in.1. Geographical Information System(ArcGIS) (1-12)2. Statistical Analysis such as SPSS or R (13-14)3. Systems Dynamics (15)Students need to exercise several problems in each theme overtime lecture.

### Textbook

in the class

### Additional Reading

Information of references will provided in the class.

### Grade Assessment

Evaluation is carried out by reports. Each report should be written based on understanding the contents of each class. Each report will be evaluated by each lecturer. Students with over 60 points out of 100 points will be passed. All classes are in English.

### Notes

Not designated.Face-to-face classes will be the basic way. If remote (interactive) classes are used, they will be conducted using Zoom or Microsoft Teams.

### Contacting Faculty

in the class

## Global Research Internship 1 (2.0credits) (グローバル研究インターンシップ1)

Course Type	Specialized Courses	
Division at course	Master's Course	
Class Format	Exercise	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring and Autumn Semester	
Lecturer	Associated Faculty	

### Course Purpose

As part of the Forefront Studies Program and the Nagoya University Global Environmental Leaders Program (NUGELP), this course aims at providing students with research-based internship opportunities at universities, research institutions, companies, governmental and non-governmental organizations in Japan and overseas to acquire the ability to conduct practical and applied research.

After completing this course, students will be able to:

- 1.explain various issues in civil engineering fields in Japan, as well as overseas, and
- 2.acquire a comprehensive methodology for executing projects in infrastructure development.

### Prerequisite Subjects

Students are expected to have taken some lectures offered by the Forefront Studies Program and the Nagoya University Global Environmental Leaders Program (NUGELP).

### Course Topics

Students are expected to acquire practical research know-how through On-site Research Training (ORT).

Course Schedule:

Step 1: Initial Proposal Submission

Step 2: Detailed Proposal Submission

Step 3: Internship

Step 4: Final Report Submission

Submit the proposal and report by the due date, and report details of your internship as the final report.

The period and terms of implementation should be decided thorough consultation with academic advisor(s) and experts at host institutions.

### Textbook

Textbooks will be recommended at the right time.

### Additional Reading

Reference books will be recommended at the right time.

### Grade Assessment

All reports will be evaluated comprehensively, and the ability to discuss the knowledge and experience gained through the internship will be the criterion for passing the course.

### Notes

No prerequisite

### Contacting Faculty

Nagoya University Civil and Environmental Engineering

International Programs Office

Room 223, Environmental Studies Hall

Email: ceeipo@urban.env.nagoya-u.ac.jp

Ex: 5507

## 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	Shinji DOKI Professor		

### Course Purpose

Under the instruction of the company engineer (DP, Directing Professor), I carry out the project for the problem solution by the team of several people consisting of different specialisms. In this way, it is intended to let you sense ability for problem discovery, the importance of the general intellectual power of compound eyes on the basis of real world bodily.

I know a point of view, the plan as the company and perform a discussion, exchange of opinions between the different specialty and aim for the breeding of the viewpoint general, to see engineering by examining it as the problem solution person concerned from different angles.

### Prerequisite Subjects

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

### Course Topics

I organize different specialty, the team (several/team) consisting of the students of the department several sets, and DP is the instruction in each each team. Based on the project theme that DP determined, I set the problem that a student carries out concretely. For 75 hours (principle one day a week), I accomplish the project for the problem solution.

Prior lecture to affect a project theme by the DP

Setting (opinion, information exchange, allied investigation, examination, discussion) of the concrete problem by the student

Enforcement of the problem solution project

Summary, report of the result

I assume this a main component.

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

#### Textbook

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

#### Additional Reading

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

#### Grade Assessment

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

#### Notes

No specific requirements.

#### Contacting Faculty

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

Research 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	Shinji DOKI Professor		

### Course Purpose

Through the training to affect technology development, the study of the company in the company is advanced, and experience the challenge to a practical problem. In this way, it is aimed for upbringing of human resources tying engineering to creation of the social value.

It is wider in a technique and a study, and a consciousness, ability to catch in a general viewpoint (utility, economy) and communication power is bred and aims for what is reflected by a study, the study at the university.

### Prerequisite Subjects

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

### Course Topics

In the company accepting an intern, I make the training (study) about the study theme that a company shows.

Orientation to affect the overall company concerned and the training medium

Enforcement (including cooperation, the adjustment with the company staff) of the training theme

Summary, report of the training result

I assume a report (presentation) of the training result to the university a main component.

As the associated document, documents investigation may not support during the working hours that a company sets, I do the attendance of the lecture about "the handling, a point to keep in mind by basic knowledge and the study internship of intellectual property rights" to need what I study in the training overtime by oneself, and to perform on the university side prior to the company training again with

requisiteness.

#### **Textbook**

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

#### **Additional Reading**

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

#### **Grade Assessment**

I am given in the following on 20th in the total days that engaged in the training in the company.

I do that I announce the result to the university in a result briefing session to perform after the training if essential.

I evaluate it based on result announcement contents and an evaluation book of the training staff making. I recognize an experience-based effect in the training by oneself, and will to plan reflection to a study, the study at the university does it with a pass if admitted.

#### **Notes**

No specific requirements.

#### **Contacting Faculty**

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



Research 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	Shinji DOKI Professor		

### Course Purpose

Through the training to affect technology development, the study of the company in the company is advanced, and experience the challenge to a practical problem. In this way, it is aimed for upbringing of human resources tying engineering to creation of the social value.

It is wider in a technique and a study, and a consciousness, ability to catch in a general viewpoint (utility, economy) and communication power is bred and aims for what is reflected by a study, the study at the university.

### Prerequisite Subjects

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

### Course Topics

In the company accepting an intern, I make the training (study) about the study theme that a company shows.

Orientation to affect the overall company concerned and the training medium

Enforcement (including cooperation, the adjustment with the company staff) of the training theme

Summary, report of the training result

I assume a report (presentation) of the training result to the university a main component.

As the associated document, documents investigation may not support during the working hours that a company sets, I do the attendance of the lecture about "the handling, a point to keep in mind by basic knowledge and the study internship of intellectual property rights" to need what I study in the training overtime by oneself, and to perform on the university side prior to the company training again with

requisiteness.

#### Textbook

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

#### Additional Reading

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

#### Grade Assessment

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

#### Notes

No specific requirements.

#### Contacting Faculty

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

Research 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	Shinji DOKI Professor		

### Course Purpose

Through the training to affect technology development, the study of the company in the company is advanced, and experience the challenge to a practical problem. In this way, it is aimed for upbringing of human resources tying engineering to creation of the social value.

It is wider in a technique and a study, and a consciousness, ability to catch in a general viewpoint (utility, economy) and communication power is bred and aims for what is reflected by a study, the study at the university.

### Prerequisite Subjects

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

### Course Topics

In the company accepting an intern, I make the training (study) about the study theme that a company shows.

Orientation to affect the overall company concerned and the training medium

Enforcement (including cooperation, the adjustment with the company staff) of the training theme

Summary, report of the training result

I assume a report (presentation) of the training result to the university a main component.

As the associated document, documents investigation may not support during the working hours that a company sets, I do the attendance of the lecture about "the handling, a point to keep in mind by basic knowledge and the study internship of intellectual property rights" to need what I study in the training overtime by oneself, and to perform on the university side prior to the company training again with

requisiteness.

#### **Textbook**

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

#### **Additional Reading**

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

#### **Grade Assessment**

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

#### **Notes**

No specific requirements.

#### **Contacting Faculty**

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

Research 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	Shinji DOKI Professor		

**Course Purpose**

Through the training to affect technology development, the study of the company in the company is advanced, and experience the challenge to a practical problem. In this way, it is aimed for upbringing of human resources tying engineering to creation of the social value.

It is wider in a technique and a study, and a consciousness, ability to catch in a general viewpoint (utility, economy) and communication power is bred and aims for what is reflected by a study, the study at the university.

**Prerequisite Subjects**

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

**Course Topics**

In the company accepting an intern, I make the training (study) about the study theme that a company shows.

Orientation to affect the overall company concerned and the training medium

Enforcement (including cooperation, the adjustment with the company staff) of the training theme

Summary, report of the training result

I assume a report (presentation) of the training result to the university a main component.

As the associated document, documents investigation may not support during the working hours that a company sets, I do the attendance of the lecture about "the handling, a point to keep in mind by basic knowledge and the study internship of intellectual property rights" to need what I study in the training overtime by oneself, and to perform on the university side prior to the company training again with

requisiteness.

#### **Textbook**

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

#### **Additional Reading**

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

#### **Grade Assessment**

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

#### **Notes**

No specific requirements.

#### **Contacting Faculty**

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

**Research 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
	1 Spring and Autumn Semester	1 Spring and Autumn Semester	1 Spring and Autumn Semester
Lecturer	Shinji DOKI Professor		

**Course Purpose**

Through the training to affect technology development, the study of the company in the company is advanced, and experience the challenge to a practical problem. In this way, it is aimed for upbringing of human resources tying engineering to creation of the social value.

It is wider in a technique and a study, and a consciousness, ability to catch in a general viewpoint (utility, economy) and communication power is bred and aims for what is reflected by a study, the study at the university.

**Prerequisite Subjects**

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

**Course Topics**

In the company accepting an intern, I make the training (study) about the study theme that a company shows.

Orientation to affect the overall company concerned and the training medium

Enforcement (including cooperation, the adjustment with the company staff) of the training theme

Summary, report of the training result

I assume a report (presentation) of the training result to the university a main component.

As the associated document, documents investigation may not support during the working hours that a company sets, I do the attendance of the lecture about "the handling, a point to keep in mind by basic knowledge and the study internship of intellectual property rights" to need what I study in the training overtime by oneself, and to perform on the university side prior to the company training again with

requisiteness.

#### **Textbook**

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

#### **Additional Reading**

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

#### **Grade Assessment**

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

#### **Notes**

No specific requirements.

#### **Contacting Faculty**

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



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	Manato DEKI Associate Professor		

### Course Purpose

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

### Prerequisite Subjects

Knowledge of the subject areas.

### Course Topics

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

### Textbook

Distribute as appropriate.

### Additional Reading

Distribute as appropriate.

### Grade Assessment

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

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

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

### Notes

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

### Important Notes

Students who wish to take the course will be able to register for the "Advanced Lectures on Frontier Technologies and Sciences" at NUCT after they have registered for the course.

Note that all contacts from NUCT are available for the lectures.

Students who missed the registration period should register the page of "Advanced Lectures on Frontier Technologies and Sciences" on the NUCT website.

### Contacting Faculty

Arranging the schedules by e-mail and etc.

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

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

### Course Purpose

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

### Prerequisite Subjects

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

### Course Topics

The experiment will be conducted at the Venture Business Laboratory building.

The report meeting will be held online or at the above building.

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

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

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

### Textbook

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

### Additional Reading

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

### Grade Assessment

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

### Notes

#### Course Registration

No course requirements.

The number of registered students should be about 10.

### Important Notes

Students who wish to take the course will be able to register for the "Advanced Experiments for Frontier Technologies and Sciences" at NUCT after they have registered for the course.

Note that all contacts from NUCT are available for the lectures.

Students who missed the registration period should register the page of "Advanced Experiments for Frontier Technologies and Sciences" on the NUCT website.

### Contacting Faculty

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

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

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

**Course Purpose**

Students will learn presentation skills for academic purposes, which may include giving academic presentations.

Japanese students are expected to present in English and international students in Japanese in the seventh or eighth class meeting.

By taking this class, students are expected to be able to do the following:

- Give a solid presentation with confidence and without 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

Textbooks and references are not assigned for this class. However, depending on the student and class progress, necessary materials will be distributed in class.

#### Additional Reading

1The Japan Times

2:

#### Grade Assessment

Individual presentation: 50%

Active class participation: 50%

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

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

#### Notes

There are no requirements for taking this class.

This class will be held face to face unless there are international students who cannot come to Japan.

#### Contacting Faculty

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

E-mail address o47251a@cc.nagoya-u.ac.jp

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

### Course Purpose

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

1. Understand the latest technology of automotive engineering.
2. Understand company's automotive production system.
3. Improve English ability in the field of science 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

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

ysakai@mech.nagoya-u.ac.jp



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

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

**Course Purpose**

This course aims to help students write a well-structured research paper in English and expand their vocabulary and expression list relating to academic writing.

By the end of the course, students will be able to:

- explain the basic structure of a research paper
- explain the characteristics of each component
- use vocabulary adequately
- use expressions adequately
- choose the most relevant citation style
- write a mini research paper

**Prerequisite Subjects**

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

**Course Topics**

English is the language of instruction in this course.

After reviewing the basics of academic writing, students will understand the fundamental structure of the research paper. Students will improve their vocabulary and expressions to write a well-structured paper as they analyze sample research papers. Additionally, students will understand the citation styles by exploring the descriptions in the instructions for authors in the academic journals of their choice. In the classroom activities, students will exchange ideas, give an oral presentation, practice their writing skills, and give feedback to each other.

1. Basics of academic writing in English 1: Paragraph writing
2. Basics of academic writing in English 2: Making an outline
3. Fundamental structure of research paper: Structural analysis

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

### Textbook

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

### Additional Reading

Glasman-Deal, H. (2021). *Science Research Writing: For Non-Native Speakers of English*. Imperial College Press.

Paltridge, B. (2019). *Thesis and Dissertation Writing in a Second Language*. Routledge.

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

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

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

### Grade Assessment

The following evaluation items constitute the maximum score of 100:

Class Participation (25%)

Homework Assignments (35%)

Oral Presentation (10%)

Mini-Research Paper (30%)

A student must evidence a total score of 60 or higher on the final grading scale to pass this course.

### Notes

-No prerequisite.

-There is a chance to redesign the class format, schedule, and grading system depending on the COVID-19 situation.

-There will be approximately six face-to-face classes and two online (synchronous or on-demand) classes.

-Online, synchronous classes will be given on Zoom, whereas the on-demand classes will be given on NUCT.

-The first class will be met face-to-face in the regular classroom on campus, and the class format in the remaining semester will be announced via "Messages" on NUCT.

-Students are expected to express/exchange their ideas and opinions on NUCT and/or on another interactive presentation system to be announced in class.

-An active dialog is highly valued in this class, so your enthusiastic participation is vital to the success of your learning.

-Basically, homework is assigned on a weekly basis.

### Contacting Faculty

Use the "Messages" tool on NUCT to contact the instructor. Only for a limited period of time (until the secondary course registration period ends), you can reach the instructor by email.

smrym(at)lets.chukyo-u.ac.jp

Please replace (at) with @, the at symbol.

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

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	1 Spring Semester
Lecturer	Part-time Faculty	Manato DEKI Assistant Professor	

### Course Purpose

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

### Prerequisite Subjects

### Course Topics

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

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

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

### Textbook

Distribute materials as appropriate.

### Additional Reading

### Grade Assessment

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

### Notes

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

### Important Notes

Students who wish to take the course will be able to register for the "Focus on Venture Business I" at NUCT after they have registered for the course.

Note that all contacts from NUCT are available for the lectures.

Students who missed the registration period should register the page of "Focus on Venture Business I" on the NUCT website.

In addition, all lectures will be conducted remotely using online conferencing tools.

### Contacting Faculty

the break after the lecture.

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

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

### Course Purpose

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

Lectures will be held in a discussion style.

As a part of this, the maximum number of registered students will be set at 60.

If the number of registered students exceeds 60, students will be selected by lottery. The number of students will be determined by lottery.

Students who wish to take this course should first register at NUCT.

Information on the lottery will be sent to applicants via the NUCT lecture website.

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

### Prerequisite Subjects

#### Course Topics

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

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

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

Textbook

Additional Reading

Grade Assessment

Notes

Lectures will be held in a discussion style.

As a part of this, the maximum number of registered students will be set at 60.

If the number of registered students exceeds 60, students will be selected by lottery. The number of students will be determined by lottery.

Students who wish to take this course should first register at NUCT.

Information on the lottery will be sent to applicants via the NUCT lecture website.

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

Contacting Faculty

## Internship A (1.0credits) (学外実習 A)

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

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### Course Purpose

The aim of the lecture is to understand the requirements for civil engineers in actual fields through on-site and hands-on experiences.

After completing this course, students will be able to:

1. Explain various issues in civil engineering fields, and
2. Acquire a comprehensive methodology for executing projects in infrastructure development.

### Prerequisite Subjects

Not specified

### Course Topics

On-site and hands-on experiences in the field of civil engineering.

Requirements for the lecture are as follows:

1. Students attend the experiences more than 10 days or 64 hours.
2. Students submit a report and make a presentation at the end of this lecture.

### Textbook

Textbooks will be recommended at the right time.

### Additional Reading

Reference books will be recommended at the right time.

### Grade Assessment

Credits will be awarded to those students who score 'Pass'.

Requirements for pass the lecture are as follows.

- 1) Students attend the experiences more than 10 days or 64 hours.
- 2) Students pass the evaluation by the officers and engineers on site.
- 3) Report and presentation

### Notes

No prerequisite

### Contacting Faculty

Questions are accepted anytime through email.

**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

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

### Course Purpose

Through the lectures on various super-interdisciplinary mobility innovations for life-style transformation, learn the impacts and changes of life-style caused by the mobility innovations.

The ability to understand the mobility innovations from various perspectives, and to implement them based on the understandings from various disciplines are required to realize the life-style transformations by mobility innovations. The purposes of this class is to obtain the ability as below.

- understand the mobility innovations from various disciplines
- analyze the effects of and forecast the future of mobility innovations

### Prerequisite Subjects

Not required

### Course Topics

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

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

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

### Textbook

Materials are provided at classes.

### Additional Reading

Introduced according to the process of the lecture.

### Grade Assessment

Evaluated by reports.

### Notes

Not required.

### Contacting Faculty

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

Yamamoto: 4636, [yamamoto@civil.nagoya-u.ac.jp](mailto:yamamoto@civil.nagoya-u.ac.jp)

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

### Course Purpose

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

- understand comprehensively the mobility innovations from various disciplines
- analyze deeper the effects of and forecast the future of mobility innovations

### Prerequisite Subjects

Advanced super-interdisciplinary mobility innovation I

### Course Topics

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

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

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

### Textbook

Materials are provided at classes.

### Additional Reading

Introduced according to the process of the lecture.

### Grade Assessment

Evaluated by reports.

#### Notes

Not required.

#### Contacting Faculty

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

Yamamoto: 4636, [yamamoto@civil.nagoya-u.ac.jp](mailto:yamamoto@civil.nagoya-u.ac.jp)

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

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

**Course Purpose**

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

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

**Prerequisite Subjects**

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

**Course Topics**

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

Read carefully the textbook before attending each class. After each class, solving the exercises in the textbook is highly recommended. Submission of the report after each class is mandatory.

#### Textbook

Original lecture note will be provided.

#### Additional Reading

It will be announced in the class if necessary.

#### Grade Assessment

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

#### Notes

No particular requirement.

#### Contacting Faculty

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

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

### Course Purpose

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

### Prerequisite Subjects

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

### Course Topics

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



#### Textbook

Original lecture note will be provided.

#### Additional Reading

It will be announced in the class if necessary.

#### Grade Assessment

Evaluation is based on the student's effort for solving the tasks, total score of reports, and final presentation. You need more than mark of 60 out of 100 points. Special certificate will be provided for passed students.

#### Notes

No particular requirement.

#### Contacting Faculty

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

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 Structural Engineering 2A (2.0credits) (構造工学セミナー2A)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	1 Spring Semester	1 Autumn Semester	
Lecturer	Junji KATO Professor	NISHIGUCHI Koji Lecturer	Hiroya HOSHIBA Assistant Professor

### Course Purpose

To understand basic theory of finite element method and continuum mechanics.

Performance targets:

- 1) To understand finite element analysis and to be able to make the source code by yourself
- 2) To understand nonlinear finite element analysis and to be able to make the source code by yourself

### Prerequisite Subjects

Computational Mechanics, Structural Mechanics, Applied Structural Mechanics, Strengths of Structures in Ultimate States, etc.

### Course Topics

#### 1. Finite Element Method

- Basic concept of principle of virtual work
- Discretization method
- Newton-Raphson method
- Nonlinear structural analysis and its solution method

Several reports will be given in the class.

### Textbook

Finite Element Procedures (K.J. Bathe) and handout will be given.

### Additional Reading

Reference books are introduced at the first lecture.

### Grade Assessment

Required to understand the basic knowledge of continuum mechanics and finite element method.

The goal attainment level is evaluated by both results of attendance and attitude of learning in this class.

60 points or more are accepted for 100 full marks

### Notes

No special requirement is necessary.

Class embodiments and tools used: The seminar is interactive online class using Zoom.

### Contacting Faculty

Questions are welcome during the seminar.

The lecturer in charge

Lecturer: Koji Nishiguchi

[https://profs.provost.nagoya-u.ac.jp/html/100011123\\_en.html](https://profs.provost.nagoya-u.ac.jp/html/100011123_en.html)

## Seminar on Structural Engineering 2B (2.0credits) (構造工学セミナー2B)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	1 Autumn Semester	1 Spring Semester	
Lecturer	Junji KATO Professor	NISHIGUCHI Koji Lecturer	Hiroya HOSHIBA Assistant Professor

### Course Purpose

To understand basic theory of finite element method and continuum mechanics.

Performance targets:

- 1) To understand finite element analysis and to be able to make the source code by yourself
- 2) To understand nonlinear finite element analysis and to be able to make the source code by yourself

### Prerequisite Subjects

Computational Mechanics, Structural Mechanics, Applied Structural Mechanics, Strengths of Structures in Ultimate States, etc.

### Course Topics

#### 1. Finite Element Method

- Basic concept of principle of virtual work
- Discretization method
- Newton-Raphson method
- Nonlinear structural analysis and its solution method

Several reports will be given in the class.

### Textbook

Finite Element Procedures (K.J. Bathe) and handout will be given.

### Additional Reading

Reference books are introduced at the first lecture.

### Grade Assessment

Required to understand the basic knowledge of continuum mechanics and finite element method.

The goal attainment level is evaluated by both results of attendance and attitude of learning in this class.

60 points or more are accepted for 100 full marks

### Notes

No special requirement is necessary.

Class embodiments and tools used: The seminar is interactive online class using Zoom.

### Contacting Faculty

Questions are welcome during the seminar.

The lecturer in charge

Lecturer: Koji Nishiguchi

[https://profs.provost.nagoya-u.ac.jp/html/100011123\\_en.html](https://profs.provost.nagoya-u.ac.jp/html/100011123_en.html)

## Seminar on Structural Engineering 2C (2.0credits) (構造工学セミナー2C)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	2 Spring Semester	2 Autumn Semester	
Lecturer	Junji KATO Professor	NISHIGUCHI Koji Lecturer	Hiroya HOSHIBA Assistant Professor

### Course Purpose

To understand basic theory of finite element method and continuum mechanics.

Performance targets:

- 1) To understand finite element analysis and to be able to make the source code by yourself
- 2) To understand nonlinear finite element analysis and to be able to make the source code by yourself

### Prerequisite Subjects

Computational Mechanics, Structural Mechanics, Applied Structural Mechanics, Strengths of Structures in Ultimate States, etc.

### Course Topics

#### 1. Finite Element Method

- Basic concept of principle of virtual work
- Discretization method
- Newton-Raphson method
- Nonlinear structural analysis and its solution method

Several reports will be given in the class.

### Textbook

Finite Element Procedures (K.J. Bathe) and handout will be given.

### Additional Reading

Reference books are introduced at the first lecture.

### Grade Assessment

Required to understand the basic knowledge of continuum mechanics and finite element method.

The goal attainment level is evaluated by both results of attendance and attitude of learning in this class.

60 points or more are accepted for 100 full marks

### Notes

No special requirement is necessary.

Class embodiments and tools used: The seminar is interactive online class using Zoom.

### Contacting Faculty

Questions are welcome during the seminar.

The lecturer in charge

Lecturer: Koji Nishiguchi

[https://profs.provost.nagoya-u.ac.jp/html/100011123\\_en.html](https://profs.provost.nagoya-u.ac.jp/html/100011123_en.html)

## Seminar on Structural Engineering 2D (2.0credits) (構造工学セミナー2D)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	2 Autumn Semester	2 Spring Semester	
Lecturer	Junji KATO Professor	NISHIGUCHI Koji Lecturer	Hiroya HOSHIBA Assistant Professor

### Course Purpose

To understand basic theory of finite element method and continuum mechanics.

Performance targets:

- 1) To understand finite element analysis and to be able to make the source code by yourself
- 2) To understand nonlinear finite element analysis and to be able to make the source code by yourself

### Prerequisite Subjects

Computational Mechanics, Structural Mechanics, Applied Structural Mechanics, Strengths of Structures in Ultimate States, etc.

### Course Topics

#### 1. Finite Element Method

- Basic concept of principle of virtual work
- Discretization method
- Newton-Raphson method
- Nonlinear structural analysis and its solution method

Several reports will be given in the class.

### Textbook

Finite Element Procedures (K.J. Bathe) and handout will be given.

### Additional Reading

Reference books are introduced at the first lecture.

### Grade Assessment

Required to understand the basic knowledge of continuum mechanics and finite element method.

The goal attainment level is evaluated by both results of attendance and attitude of learning in this class.

60 points or more are accepted for 100 full marks

### Notes

No special requirement is necessary.

Class embodiments and tools used: The seminar is interactive online class using Zoom.

### Contacting Faculty

Questions are welcome during the seminar.

The lecturer in charge

Lecturer: Koji Nishiguchi

[https://profs.provost.nagoya-u.ac.jp/html/100011123\\_en.html](https://profs.provost.nagoya-u.ac.jp/html/100011123_en.html)

## Seminar on Structural Engineering 2E (2.0credits) (構造工学セミナー2E)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	3 Spring Semester	3 Autumn Semester	
Lecturer	Junji KATO Professor	NISHIGUCHI Koji Lecturer	Hiroya HOSHIBA Assistant Professor

### Course Purpose

To understand basic theory of finite element method and continuum mechanics.

Performance targets:

- 1) To understand finite element analysis and to be able to make the source code by yourself
- 2) To understand nonlinear finite element analysis and to be able to make the source code by yourself

### Prerequisite Subjects

Computational Mechanics, Structural Mechanics, Applied Structural Mechanics, Strengths of Structures in Ultimate States, etc.

### Course Topics

#### 1. Finite Element Method

- Basic concept of principle of virtual work
- Discretization method
- Newton-Raphson method
- Nonlinear structural analysis and its solution method

Several reports will be given in the class.

### Textbook

Finite Element Procedures (K.J. Bathe) and handout will be given.

### Additional Reading

Reference books are introduced at the first lecture.

### Grade Assessment

Required to understand the basic knowledge of continuum mechanics and finite element method.

The goal attainment level is evaluated by both results of attendance and attitude of learning in this class.

60 points or more are accepted for 100 full marks

### Notes

No special requirement is necessary.

Class embodiments and tools used: The seminar is interactive online class using Zoom.

### Contacting Faculty

Questions are welcome during the seminar.

The lecturer in charge

Lecturer: Koji Nishiguchi

[https://profs.provost.nagoya-u.ac.jp/html/100011123\\_en.html](https://profs.provost.nagoya-u.ac.jp/html/100011123_en.html)



Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Autumn Semester
Lecturer	Hikaru NAKAMURA Professor	Taito Miura Associate Professor

### Course Purpose

The purpose of these practices is to acquire basic and applied knowledge for understanding the properties of cement, cement paste and concrete and the mechanisms of cement hydration using text book written in English. Furthermore, the participants would be able to get into the total power such as gathering information, relevant technique investigation and presentation skills as going through the presentation.

After completing this class, students will be able to:

1. Explain basic knowledge of cement chemistry
2. Literature survey of cement chemistry

### Prerequisite Subjects

Advanced Concrete Structure, Advanced Course in Lifecycle Design of Civil Structures, Exercise in Inspection of Civil Structures

### Course Topics

1. Property of Cement  
Type of cement  
Crystal structure of cement
2. Property of Cement paste  
Hydration process of each cement type  
Micro-structure of cement hydrates

Before class, please prepare next class and literature survey to related part. After class, please confirm related literature.

### Textbook

Cement Chemistry 2nd edition H.F.W. Taylor, Thomas Telford

### Additional Reading

Reference books will be recommended at the right time

### Grade Assessment

Considering the results of presentations and Oral examinations, the student who can understand and explain the fundamental knowledge of cement chemistry will be accepted. If the student can understand and explain further highly professional knowledge, the score will be reflected with accompanying the knowledge.

### Notes

\*There is no requirement of the course.

\*This lecture is planning to consist of online (Zoom) and face to face lectures. The detail information and schedule will be informed through NUCT.

Students who have a question on this class can contact to Taito Miura (t.miura(at)civil.nagoya-u.ac.jp).

### Contacting Faculty

Welcome to come to room directly anytime and question by e-mail t.miura(at)civil.nagoya-u.ac.jp

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Autumn Semester	1 Spring Semester
Lecturer	Hikaru NAKAMURA Professor	Taito Miura Associate Professor

### Course Purpose

The purpose of these practices is to acquire basic and applied knowledge for understanding the properties of cement, cement paste and concrete and the mechanisms of cement hydration using text book written in English. Furthermore, the participants would be able to get into the total power such as gathering information, relevant technique investigation and presentation skills as going through the presentation.

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### Prerequisite Subjects

Advanced Concrete Structure, Advanced Course in Lifecycle Design of Civil Structures, Exercise in Inspection of Civil Structures

### Course Topics

1. Property of Cement  
Type of cement  
Crystal structure of cement
2. Property of Cement paste  
Hydration process of each cement type  
Micro-structure of cement hydrates

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### Textbook

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### Notes

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### Contacting Faculty

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Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Spring Semester	2 Autumn Semester
Lecturer	Hikaru NAKAMURA Professor	Taito Miura Associate Professor

### Course Purpose

The purpose of these practices is to acquire basic and applied knowledge for understanding the properties of cement, cement paste and concrete and the mechanisms of cement hydration using text book written in English. Furthermore, the participants would be able to get into the total power such as gathering information, relevant technique investigation and presentation skills as going through the presentation.

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Micro-structure of cement hydrates

Before class, please prepare next class and literature survey to related part. After class, please confirm related literature.

### Textbook

Cement Chemistry 2nd edition H.F.W. Taylor, Thomas Telford

### Additional Reading

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### Grade Assessment

Considering the results of presentations and Oral examinations, the student who can understand and explain the fundamental knowledge of cement chemistry will be accepted. If the student can understand and explain further highly professional knowledge, the score will be reflected with accompanying the knowledge.

### Notes

\*There is no requirement of the course.

\*This lecture is planning to consist of online (Zoom) and face to face lectures. The detail information and schedule will be informed through NUCT.

Students who have a question on this class can contact to Taito Miura (t.miura(at)civil.nagoya-u.ac.jp).

### Contacting Faculty

Welcome to come to room directly anytime and question by e-mail t.miura(at)civil.nagoya-u.ac.jp

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Autumn Semester	2 Spring Semester
Lecturer	Hikaru NAKAMURA Professor	Taito Miura Associate Professor

### Course Purpose

The purpose of these practices is to acquire basic and applied knowledge for understanding the properties of cement, cement paste and concrete and the mechanisms of cement hydration using text book written in English. Furthermore, the participants would be able to get into the total power such as gathering information, relevant technique investigation and presentation skills as going through the presentation.

After completing this class, students will be able to:

1. Explain basic knowledge of cement chemistry
2. Literature survey of cement chemistry

### Prerequisite Subjects

Advanced Concrete Structure, Advanced Course in Lifecycle Design of Civil Structures, Exercise in Inspection of Civil Structures

### Course Topics

1. Property of Cement  
Type of cement  
Crystal structure of cement
2. Property of Cement paste  
Hydration process of each cement type  
Micro-structure of cement hydrates

Before class, please prepare next class and literature survey to related part. After class, please confirm related literature.

### Textbook

Cement Chemistry 2nd edition H.F.W. Taylor, Thomas Telford

### Additional Reading

Reference books will be recommended at the right time

### Grade Assessment

Considering the results of presentations and Oral examinations, the student who can understand and explain the fundamental knowledge of cement chemistry will be accepted. If the student can understand and explain further highly professional knowledge, the score will be reflected with accompanying the knowledge.

### Notes

\*There is no requirement of the course.

\*This lecture is planning to consist of online (Zoom) and face to face lectures. The detail information and schedule will be informed through NUCT.

Students who have a question on this class can contact to Taito Miura (t.miura(at)civil.nagoya-u.ac.jp).

### Contacting Faculty

Welcome to come to room directly anytime and question by e-mail t.miura(at)civil.nagoya-u.ac.jp

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	3 Spring Semester	3 Autumn Semester
Lecturer	Hikaru NAKAMURA Professor	Taito Miura Associate Professor

### Course Purpose

The purpose of these practices is to acquire basic and applied knowledge for understanding the properties of cement, cement paste and concrete and the mechanisms of cement hydration using text book written in English. Furthermore, the participants would be able to get into the total power such as gathering information, relevant technique investigation and presentation skills as going through the presentation.

After completing this class, students will be able to:

1. Explain basic knowledge of cement chemistry
2. Literature survey of cement chemistry

### Prerequisite Subjects

Advanced Concrete Structure, Advanced Course in Lifecycle Design of Civil Structures, Exercise in Inspection of Civil Structures

### Course Topics

1. Property of Cement  
Type of cement  
Crystal structure of cement
2. Property of Cement paste  
Hydration process of each cement type  
Micro-structure of cement hydrates

Before class, please prepare next class and literature survey to related part. After class, please confirm related literature.

### Textbook

Cement Chemistry 2nd edition H.F.W. Taylor, Thomas Telford

### Additional Reading

Reference books will be recommended at the right time

### Grade Assessment

Considering the results of presentations and Oral examinations, the student who can understand and explain the fundamental knowledge of cement chemistry will be accepted. If the student can understand and explain further highly professional knowledge, the score will be reflected with accompanying the knowledge.

### Notes

\*There is no requirement of the course.

\*This lecture is planning to consist of online (Zoom) and face to face lectures. The detail information and schedule will be informed through NUCT.

Students who have a question on this class can contact to Taito Miura (t.miura(at)civil.nagoya-u.ac.jp).

### Contacting Faculty

Welcome to come to room directly anytime and question by e-mail t.miura(at)civil.nagoya-u.ac.jp

## Seminar on Conservation Engineering of River Basins 2A (2.0credits) (流域保全学セミナー2A)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Autumn Semester
Lecturer	Yuji Toda Professor	RyotaTSUBAKI Associate Professor

### Course Purpose

Basic and advanced research on fluvial hydraulics and hydrology and its relation to the ecosystem will be reviewed and discussed. Research methods will also be reviewed and discussed.

The objective of this course is to acquire the skills to understand the trends in research on conservation engineering of river basins and the methods to conduct hydraulics, hydrological and ecosystem researches.

### Prerequisite Subjects

Hydrology and River Engineering, Open-channel hydraulics, Fundamental of Hydrodynamics with Exercises, Human activities and environment

### Course Topics

1. Paper reviewing method
2. Fluvial hydraulics and hydrology and its relation to the ecosystem
3. Measurement and modeling of river morphology and hydraulics
4. Measurements for ecosystem

Documents and experiment preparation is required prior to the seminar. Data analysis and report submission are asked following the seminar.

### Textbook

Directed as needed

### Additional Reading

Directed as needed

### Grade Assessment

Presentation and report will be used for grading. To acquire basic skills of research review or fundamental methods for research is the criteria to pass. Advanced skills for reviewing and research will be accounted for the grade.

### Notes

No course requirements are specified.

- The class will be given by physical lecture or online in the on-demand format and/or the real-time format using Teams/Zoom. Details will be announced on NUCT.

- If you have any questions, please contact to the lecturer via e-mail or "Messages" of NUCT.

- If you want to exchange information among students, please use "Message" of NUCT.

### Contacting Faculty

Discuss during the seminar or asking by e-mail.

## Seminar on Conservation Engineering of River Basins 2B (2.0credits) (流域保全学セミナー2B)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Autumn Semester	1 Spring Semester
Lecturer	Yuji Toda Professor	Ryota TSUBAKI Associate Professor

### Course Purpose

Basic and advanced research on fluvial hydraulics and hydrology and its relation to the ecosystem will be reviewed and discussed. Research methods will also be reviewed and discussed.

The objective of this course is to acquire the skills to understand the trends in research on conservation engineering of river basins and the methods to conduct hydraulics, hydrological and ecosystem researches.

### Prerequisite Subjects

Hydrology and River Engineering, Open-channel hydraulics, Fundamental of Hydrodynamics with Exercises, Human activities and environment

### Course Topics

1. Paper reviewing method
2. Fluvial hydraulics and hydrology and its relation to the ecosystem
3. Measurement and modeling of river morphology and hydraulics
4. Measurements for ecosystem

Documents and experiment preparation is required prior to the seminar. Data analysis and report submission are asked following the seminar.

### Textbook

Directed as needed

### Additional Reading

Directed as needed

### Grade Assessment

Presentation and report will be used for grading. To acquire basic skills of research review or fundamental methods for research is the criteria to pass. Advanced skills for reviewing and research will be accounted for the grade.

### Notes

No course requirements are specified.

- The class will be given by physical lecture or online in the on-demand format and/or the real-time format using Teams/Zoom (will be determined based on the participants' capability). Details will be announced on NUCT.

- If you have any questions, please contact to the lecturer via e-mail or "Messages" of NUCT.

- If you want to exchange information among students, please use "Message" of NUCT.

### Contacting Faculty

Discuss during the seminar or asking by e-mail.

## Seminar on Conservation Engineering of River Basins 2C (2.0credits) (流域保全学セミナー2C)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Spring Semester	2 Autumn Semester
Lecturer	Yuji Toda Professor	Ryota TSUBAKI Associate Professor

### Course Purpose

Basic and advanced research on fluvial hydraulics and hydrology and its relation to the ecosystem will be reviewed and discussed. Research methods will also be reviewed and discussed.

The objective of this course is to acquire the skills to understand the trends in research on conservation engineering of river basins and the methods to conduct hydraulics, hydrological and ecosystem researches.

### Prerequisite Subjects

Hydrology and River Engineering, Open-channel hydraulics, Fundamental of Hydrodynamics with Exercises, Human activities and environment

### Course Topics

1. Paper reviewing method
2. Fluvial hydraulics and hydrology and its relation to the ecosystem
3. Measurement and modeling of river morphology and hydraulics
4. Measurements for ecosystem

Documents and experiment preparation is required prior to the seminar. Data analysis and report submission are asked following the seminar.

### Textbook

Directed as needed

### Additional Reading

Directed as needed

### Grade Assessment

Presentation and report will be used for grading. To acquire basic skills of research review or fundamental methods for research is the criteria to pass. Advanced skills for reviewing and research will be accounted for the grade.

### Notes

No course requirements are specified.

- The class will be given by physical lecture or online in the on-demand format and/or the real-time format using Teams/Zoom (will be determined based on the participants' capability). Details will be announced on NUCT.

- If you have any questions, please contact to the lecturer via e-mail or "Messages" of NUCT.

- If you want to exchange information among students, please use "Message" of NUCT.

### Contacting Faculty

Discuss during the seminar or asking by e-mail.



## Seminar on Conservation Engineering of River Basins 2D (2.0credits) (流域保全学セミナー2D)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Autumn Semester	2 Spring Semester
Lecturer	Yuji Toda Professor	Ryota TSUBAKI Associate Professor

### Course Purpose

Basic and advanced research on fluvial hydraulics and hydrology and its relation to the ecosystem will be reviewed and discussed. Research methods will also be reviewed and discussed.

The objective of this course is to acquire the skills to understand the trends in research on conservation engineering of river basins and the methods to conduct hydraulics, hydrological and ecosystem researches.

### Prerequisite Subjects

Hydrology and River Engineering, Open-channel hydraulics, Fundamental of Hydrodynamics with Exercises, Human activities and environment

### Course Topics

1. Paper reviewing method
2. Fluvial hydraulics and hydrology and its relation to the ecosystem
3. Measurement and modeling of river morphology and hydraulics
4. Measurements for ecosystem

Documents and experiment preparation is required prior to the seminar. Data analysis and report submission are asked following the seminar.

### Textbook

Directed as needed

### Additional Reading

Directed as needed

### Grade Assessment

Presentation and report will be used for grading. To acquire basic skills of research review or fundamental methods for research is the criteria to pass. Advanced skills for reviewing and research will be accounted for the grade.

### Notes

No course requirements are specified.

- The class will be given by physical lecture or online in the on-demand format and/or the real-time format using Teams/Zoom (will be determined based on the participants' capability). Details will be announced on NUCT.

- If you have any questions, please contact to the lecturer via e-mail or "Messages" of NUCT.

- If you want to exchange information among students, please use "Message" of NUCT.

### Contacting Faculty

Discuss during the seminar or asking by e-mail.

## Seminar on Conservation Engineering of River Basins 2E (2.0credits) (流域保全学セミナー2E)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	3 Spring Semester	3 Autumn Semester
Lecturer	Yuji Toda Professor	Ryota TSUBAKI Associate Professor

### Course Purpose

Basic and advanced research on fluvial hydraulics and hydrology and its relation to the ecosystem will be reviewed and discussed. Research methods will also be reviewed and discussed.

The objective of this course is to acquire the skills to understand the trends in research on conservation engineering of river basins and the methods to conduct hydraulics, hydrological and ecosystem researches.

### Prerequisite Subjects

Hydrology and River Engineering, Open-channel hydraulics, Fundamental of Hydrodynamics with Exercises, Human activities and environment

### Course Topics

1. Paper reviewing method
2. Fluvial hydraulics and hydrology and its relation to the ecosystem
3. Measurement and modeling of river morphology and hydraulics
4. Measurements for ecosystem

Documents and experiment preparation is required prior to the seminar. Data analysis and report submission are asked following the seminar.

### Textbook

Directed as needed

### Additional Reading

Directed as needed

### Grade Assessment

Presentation and report will be used for grading. To acquire basic skills of research review or fundamental methods for research is the criteria to pass. Advanced skills for reviewing and research will be accounted for the grade.

### Notes

No course requirements are specified.

- The class will be given by physical lecture or online in the on-demand format and/or the real-time format using Teams/Zoom (will be determined based on the participants' capability). Details will be announced on NUCT.

- If you have any questions, please contact to the lecturer via e-mail or "Messages" of NUCT.

- If you want to exchange information among students, please use "Message" of NUCT.

### Contacting Faculty

Discuss during the seminar or asking by e-mail.

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	1 Spring Semester	1 Autumn Semester	
Lecturer	norimi mizutani Professor	Tomoaki NAKAMURA Associate Professor	YonghwanCHO Assistant Professor

---

### Course Purpose

The aim of this course is to review and discuss refereed journal papers in order to understand physical processes on coastal and ocean engineering.

Course objectives:

Students will be able to

1. explain what theoretical, experimental, and numerical methods used in coastal and ocean engineering are
2. understand state-of-the-art research in coastal and ocean engineering

### Prerequisite Subjects

Advanced Fluvial and Coastal Hydrodynamics, Advanced Coastal and Offshore Engineering, Advanced Work in Coastal and Offshore Engineering

### Course Topics

Presentation and discussion on a refereed journal paper on coastal and ocean engineering

Students are required to read and understand a journal paper before the lecture, and prepare presentation materials summarizing the paper.

After the lecture, students are required to summarize answers to questions and review the contents of the paper.

### Textbook

Students will select refereed journal papers closely related to their research topic

### Additional Reading

Directed as needed

### Grade Assessment

Your final grade will be calculated according to the presentation and discussion. To pass, students must understand the basics of the selected journal papers on coastal and ocean engineering.

### Notes

No prerequisite

- The class will be given in the real-time online format using Teams and Slack.

### Contacting Faculty

Norimi Mizutani (ext. 4630, mizutani@civil.nagoya-u.ac.jp), Tomoaki Nakamura (ext. 4632, tnakamura@nagoya-u.jp), Yong-Hwan Cho (ext. 4634, yhcho@civil.nagoya-u.ac.jp)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	1 Autumn Semester	1 Spring Semester	
Lecturer	norimi mizutani Professor	Tomoaki NAKAMURA Associate Professor	YonghwanCHO Assistant Professor

### Course Purpose

The aim of this course is to review and discuss refereed journal papers in order to understand physical processes on coastal and ocean engineering.

Course objectives:

Students will be able to

1. explain what theoretical, experimental, and numerical methods used in coastal and ocean engineering are
2. understand state-of-the-art research in coastal and ocean engineering

### Prerequisite Subjects

Advanced Fluvial and Coastal Hydrodynamics, Advanced Coastal and Offshore Engineering, Advanced Work in Coastal and Offshore Engineering

### Course Topics

Presentation and discussion on a refereed journal paper on coastal and ocean engineering

Students are required to read and understand a journal paper before the lecture, and prepare presentation materials summarizing the paper.

After the lecture, students are required to summarize answers to questions and review the contents of the paper.

### Textbook

Students will select refereed journal papers closely related to their research topic

### Additional Reading

Directed as needed

### Grade Assessment

Your final grade will be calculated according to the presentation and discussion. To pass, students must understand the basics of the selected journal papers on coastal and ocean engineering.

### Notes

No prerequisite

- The class will be given in the real-time online format using Teams and Slack.

### Contacting Faculty

Norimi Mizutani (ext. 4630, mizutani@civil.nagoya-u.ac.jp), Tomoaki Nakamura (ext. 4632, tnakamura@nagoya-u.jp), Yong-Hwan Cho (ext. 4634, yhcho@civil.nagoya-u.ac.jp)

## Seminar on Coastal and Maritime Engineering 2C (2.0credits) (海岸・海洋工学セミナー2C)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	2 Spring Semester	2 Autumn Semester	
Lecturer	norimi mizutani Professor	Tomoaki NAKAMURA Associate Professor	YonghwanCHO Assistant Professor

### Course Purpose

The aim of this course is to review and discuss refereed journal papers in order to understand physical processes on coastal and ocean engineering.

Course objectives:

Students will be able to

1. explain what theoretical, experimental, and numerical methods used in coastal and ocean engineering are
2. understand state-of-the-art research in coastal and ocean engineering

### Prerequisite Subjects

Advanced Fluvial and Coastal Hydrodynamics, Advanced Coastal and Offshore Engineering, Advanced Work in Coastal and Offshore Engineering

### Course Topics

Presentation and discussion on a refereed journal paper on coastal and ocean engineering

Students are required to read and understand a journal paper before the lecture, and prepare presentation materials summarizing the paper.

After the lecture, students are required to summarize answers to questions and review the contents of the paper.

### Textbook

Students will select refereed journal papers closely related to their research topic

### Additional Reading

Directed as needed

### Grade Assessment

Your final grade will be calculated according to the presentation and discussion. To pass, students must understand the basics of the selected journal papers on coastal and ocean engineering.

### Notes

No prerequisite

- The class will be given in the real-time online format using Teams and Slack.

### Contacting Faculty

Norimi Mizutani (ext. 4630, mizutani@civil.nagoya-u.ac.jp), Tomoaki Nakamura (ext. 4632, tnakamura@nagoya-u.jp), Yong-Hwan Cho (ext. 4634, yhcho@civil.nagoya-u.ac.jp)

## Seminar on Coastal and Maritime Engineering 2D (2.0credits) (海岸・海洋工学セミナー2D)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	2 Autumn Semester	2 Spring Semester	
Lecturer	norimi mizutani Professor	Tomoaki NAKAMURA Associate Professor	YonghwanCHO Assistant Professor

### Course Purpose

The aim of this course is to review and discuss refereed journal papers in order to understand physical processes on coastal and ocean engineering.

Course objectives:

Students will be able to

1. explain what theoretical, experimental, and numerical methods used in coastal and ocean engineering are
2. understand state-of-the-art research in coastal and ocean engineering

### Prerequisite Subjects

Advanced Fluvial and Coastal Hydrodynamics, Advanced Coastal and Offshore Engineering, Advanced Work in Coastal and Offshore Engineering

### Course Topics

Presentation and discussion on a refereed journal paper on coastal and ocean engineering

Students are required to read and understand a journal paper before the lecture, and prepare presentation materials summarizing the paper.

After the lecture, students are required to summarize answers to questions and review the contents of the paper.

### Textbook

Students will select refereed journal papers closely related to their research topic

### Additional Reading

Directed as needed

### Grade Assessment

Your final grade will be calculated according to the presentation and discussion. To pass, students must understand the basics of the selected journal papers on coastal and ocean engineering.

### Notes

No prerequisite

- The class will be given in the real-time online format using Teams and Slack.

### Contacting Faculty

Norimi Mizutani (ext. 4630, mizutani@civil.nagoya-u.ac.jp), Tomoaki Nakamura (ext. 4632, tnakamura@nagoya-u.jp), Yong-Hwan Cho (ext. 4634, yhcho@civil.nagoya-u.ac.jp)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	3 Spring Semester	3 Autumn Semester	
Lecturer	norimi mizutani Professor	Tomoaki NAKAMURA Associate Professor	YonghwanCHO Assistant Professor

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### Course Purpose

The aim of this course is to review and discuss refereed journal papers in order to understand physical processes on coastal and ocean engineering.

Course objectives:

Students will be able to

1. explain what theoretical, experimental, and numerical methods used in coastal and ocean engineering are
2. understand state-of-the-art research in coastal and ocean engineering

### Prerequisite Subjects

Advanced Fluvial and Coastal Hydrodynamics, Advanced Coastal and Offshore Engineering, Advanced Work in Coastal and Offshore Engineering

### Course Topics

Presentation and discussion on a refereed journal paper on coastal and ocean engineering

Students are required to read and understand a journal paper before the lecture, and prepare presentation materials summarizing the paper.

After the lecture, students are required to summarize answers to questions and review the contents of the paper.

### Textbook

Students will select refereed journal papers closely related to their research topic

### Additional Reading

Directed as needed

### Grade Assessment

Your final grade will be calculated according to the presentation and discussion. To pass, students must understand the basics of the selected journal papers on coastal and ocean engineering.

### Notes

No prerequisite

- The class will be given in the real-time online format using Teams and Slack.

### Contacting Faculty

Norimi Mizutani (ext. 4630, mizutani@civil.nagoya-u.ac.jp), Tomoaki Nakamura (ext. 4632, tnakamura@nagoya-u.jp), Yong-Hwan Cho (ext. 4634, yhcho@civil.nagoya-u.ac.jp)

## Seminar on Geomaterial Engineering2A (2.0credits) (地盤材料工学セミナー2A)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Autumn Semester
Lecturer	Masaki NAKANO Professor	SAKAITakayuki Assistant Professor

### Course Purpose

This course introduces the latest knowledge of geotechnical engineering and geotechnical material engineering in order to acquire the foresight in civil engineering and the ability to bring out new scholarship, advanced teaching skills, deep professional skills, and an international perspective.

The goals of this course are to

- (1) Understand and explain theoretical, experimental, and numerical research methods in geotechnical engineering and geotechnical material engineering.
- (2) Understand and explain domestic and overseas research trends in related fields.

### Prerequisite Subjects

Advanced Geotechnical Engineering, Advanced Mechanics of Geomaterials, Advanced Soil Dynamics, Advanced Continuum Mechanics, Advanced Numerical Analysis, Advanced Work in Soil Mechanics and Geotechnical Engineering, Seminar on Geomaterial Engineering1A/1B/1C/1D

### Course Topics

1. Mechanical behavior of basic materials used in soil mechanics and geotechnical engineering  
Learning mainly about the mechanical behavior of typical sand, clay, and intermediate soils, and the description using elastoplastic constitutive models
2. Mechanical behavior of special soil and problematic soil  
Understanding and modeling the mechanical behavior of soil materials having weathering, expansive, and friable properties.
3. Effective use of generated soil and disaster waste  
Measurement to make effective usage of construction waste soil and recovered soil from disaster waste as soil material
4. Features of overseas earth materials  
Understanding the characteristics of soil generated during construction overseas and soil materials causing geological disasters.
5. Ground material improvement technology  
Understanding techniques for strengthening and stabilizing difficult-to-handle ground materials with solidified materials and short discrete fibers.

You must prepare and review materials/handouts used in seminar. In addition, you will be required to submit several report assignments, so submit them.

### Textbook

The related papers will be selected and distributed as appropriate as the seminar progresses.

### Additional Reading

References will be introduced as necessary.

### Grade Assessment

The degree of achievement of goals is comprehensively evaluated by making presentations at seminar, answering questions, contributing to discussions, and reporting on issues. The contributions are those that answer the questions and those that summarize the contents of the literature. Acceptance criteria are to be able to logically consider and discuss based on the knowledge obtained through the class, such as the



extraction and resolution of various problems in geomaterials engineering.

### Notes

No course requirements are required.

Lecture is held by ONLINE by using Zoom or Teams.

Ask questions to lecturer using E-mail.

Exchange opinions between students regarding the class using the NUCT function "Message".

### Contacting Faculty

Welcome questions during and after this seminar. Each member also accepts questions at the room and by e-mail at any time.

Masaki NAKANO: Ex.4622, nakano (at) civil.nagoya-u.ac.jp

Takayuki Sakai: Ex.2734t-sakai (at) civil.nagoya-u.ac.jp

Please replace (at) with @.

## Seminar on Geomaterial Engineering2B (2.0credits) (地盤材料工学セミナー2B)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Autumn Semester	1 Spring Semester
Lecturer	Masaki NAKANO Professor	SAKAITakayuki Assistant Professor

### Course Purpose

This course introduces the latest knowledge of geotechnical engineering and geotechnical material engineering in order to acquire the foresight in civil engineering and the ability to bring out new scholarship, advanced teaching skills, deep professional skills, and an international perspective.

The goals of this course are to

- (1) Understand and explain theoretical, experimental, and numerical research methods in geotechnical engineering and geotechnical material engineering.
- (2) Understand and explain domestic and overseas research trends in related fields.

### Prerequisite Subjects

Advanced Geotechnical Engineering, Advanced Mechanics of Geomaterials, Advanced Soil Dynamics, Advanced Continuum Mechanics, Advanced Numerical Analysis, Advanced Work in Soil Mechanics and Geotechnical Engineering, Seminar on Geomaterial Engineering1A/1B/1C/1D

### Course Topics

1. Mechanical behavior of basic materials used in soil mechanics and geotechnical engineering  
Learning mainly about the mechanical behavior of typical sand, clay, and intermediate soils, and the description using elastoplastic constitutive models
2. Mechanical behavior of special soil and problematic soil  
Understanding and modeling the mechanical behavior of soil materials having weathering, expansive, and friable properties.
3. Effective use of generated soil and disaster waste  
Measurement to make effective usage of construction waste soil and recovered soil from disaster waste as soil material
4. Features of overseas earth materials  
Understanding the characteristics of soil generated during construction overseas and soil materials causing geological disasters.
5. Ground material improvement technology  
Understanding techniques for strengthening and stabilizing difficult-to-handle ground materials with solidified materials and short discrete fibers.

You must prepare and review materials/handouts used in seminar. In addition, you will be required to submit several report assignments, so submit them.

### Textbook

The related papers will be selected and distributed as appropriate as the seminar progresses.

### Additional Reading

References will be introduced as necessary.

### Grade Assessment

The degree of achievement of goals is comprehensively evaluated by making presentations at seminar, answering questions, contributing to discussions, and reporting on issues. The contributions are those that answer the questions and those that summarize the contents of the literature. Acceptance criteria are to be able to logically consider and discuss based on the knowledge obtained through the class, such as the

extraction and resolution of various problems in geomaterials engineering.

### Notes

No course requirements are required.

Lecture is held by ONLINE by using Zoom or Teams.

Ask questions to lecturer using E-mail.

Exchange opinions between students regarding the class using the NUCT function "Message".

### Contacting Faculty

Welcome questions during and after this seminar. Each member also accepts questions at the room and by e-mail at any time.

Masaki NAKANO: Ex.4622, nakano (at) civil.nagoya-u.ac.jp

Takayuki Sakai: Ex.2734t-sakai (at) civil.nagoya-u.ac.jp

Please replace (at) with @.

## Seminar on Geomaterial Engineering2C (2.0credits) (地盤材料工学セミナー2C)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Spring Semester	2 Autumn Semester
Lecturer	Masaki NAKANO Professor	SAKAITakayuki Assistant Professor

### Course Purpose

This course introduces the latest knowledge of geotechnical engineering and geotechnical material engineering in order to acquire the foresight in civil engineering and the ability to bring out new scholarship, advanced teaching skills, deep professional skills, and an international perspective.

The goals of this course are to

- (1) Understand and explain theoretical, experimental, and numerical research methods in geotechnical engineering and geotechnical material engineering.
- (2) Understand and explain domestic and overseas research trends in related fields.

### Prerequisite Subjects

Advanced Geotechnical Engineering, Advanced Mechanics of Geomaterials, Advanced Soil Dynamics, Advanced Continuum Mechanics, Advanced Numerical Analysis, Advanced Work in Soil Mechanics and Geotechnical Engineering, Seminar on Geomaterial Engineering1A/1B/1C/1D

### Course Topics

1. Mechanical behavior of basic materials used in soil mechanics and geotechnical engineering  
Learning mainly about the mechanical behavior of typical sand, clay, and intermediate soils, and the description using elastoplastic constitutive models
2. Mechanical behavior of special soil and problematic soil  
Understanding and modeling the mechanical behavior of soil materials having weathering, expansive, and friable properties.
3. Effective use of generated soil and disaster waste  
Measurement to make effective usage of construction waste soil and recovered soil from disaster waste as soil material
4. Features of overseas earth materials  
Understanding the characteristics of soil generated during construction overseas and soil materials causing geological disasters.
5. Ground material improvement technology  
Understanding techniques for strengthening and stabilizing difficult-to-handle ground materials with solidified materials and short discrete fibers.

You must prepare and review materials/handouts used in seminar. In addition, you will be required to submit several report assignments, so submit them.

### Textbook

The related papers will be selected and distributed as appropriate as the seminar progresses.

### Additional Reading

References will be introduced as necessary.

### Grade Assessment

The degree of achievement of goals is comprehensively evaluated by making presentations at seminar, answering questions, contributing to discussions, and reporting on issues. The contributions are those that answer the questions and those that summarize the contents of the literature. Acceptance criteria are to be able to logically consider and discuss based on the knowledge obtained through the class, such as the

extraction and resolution of various problems in geomaterials engineering.

### Notes

No course requirements are required.

Lecture is held by ONLINE by using Zoom or Teams.

Ask questions to lecturer using E-mail.

Exchange opinions between students regarding the class using the NUCT function "Message".

### Contacting Faculty

Welcome questions during and after this seminar. Each member also accepts questions at the room and by e-mail at any time.

Masaki NAKANO: Ex.4622, nakano (at) civil.nagoya-u.ac.jp

Takayuki Sakai: Ex.2734t-sakai (at) civil.nagoya-u.ac.jp

Please replace (at) with @.

## Seminar on Geomaterial Engineering2D (2.0credits) (地盤材料工学セミナー2D)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Autumn Semester	2 Spring Semester
Lecturer	Masaki NAKANO Professor	SAKAITakayuki Assistant Professor

### Course Purpose

This course introduces the latest knowledge of geotechnical engineering and geotechnical material engineering in order to acquire the foresight in civil engineering and the ability to bring out new scholarship, advanced teaching skills, deep professional skills, and an international perspective.

The goals of this course are to

- (1) Understand and explain theoretical, experimental, and numerical research methods in geotechnical engineering and geotechnical material engineering.
- (2) Understand and explain domestic and overseas research trends in related fields.

### Prerequisite Subjects

Advanced Geotechnical Engineering, Advanced Mechanics of Geomaterials, Advanced Soil Dynamics, Advanced Continuum Mechanics, Advanced Numerical Analysis, Advanced Work in Soil Mechanics and Geotechnical Engineering, Seminar on Geomaterial Engineering1A/1B/1C/1D

### Course Topics

1. Mechanical behavior of basic materials used in soil mechanics and geotechnical engineering  
Learning mainly about the mechanical behavior of typical sand, clay, and intermediate soils, and the description using elastoplastic constitutive models
2. Mechanical behavior of special soil and problematic soil  
Understanding and modeling the mechanical behavior of soil materials having weathering, expansive, and friable properties.
3. Effective use of generated soil and disaster waste  
Measurement to make effective usage of construction waste soil and recovered soil from disaster waste as soil material
4. Features of overseas earth materials  
Understanding the characteristics of soil generated during construction overseas and soil materials causing geological disasters.
5. Ground material improvement technology  
Understanding techniques for strengthening and stabilizing difficult-to-handle ground materials with solidified materials and short discrete fibers.

You must prepare and review materials/handouts used in seminar. In addition, you will be required to submit several report assignments, so submit them.

### Textbook

The related papers will be selected and distributed as appropriate as the seminar progresses.

### Additional Reading

References will be introduced as necessary.

### Grade Assessment

The degree of achievement of goals is comprehensively evaluated by making presentations at seminar, answering questions, contributing to discussions, and reporting on issues. The contributions are those that answer the questions and those that summarize the contents of the literature. Acceptance criteria are to be able to logically consider and discuss based on the knowledge obtained through the class, such as the

extraction and resolution of various problems in geomaterials engineering.

### Notes

No course requirements are required.

Lecture is held by ONLINE by using Zoom or Teams.

Ask questions to lecturer using E-mail.

Exchange opinions between students regarding the class using the NUCT function "Message".

### Contacting Faculty

Welcome questions during and after this seminar. Each member also accepts questions at the room and by e-mail at any time.

Masaki NAKANO: Ex.4622, nakano (at) civil.nagoya-u.ac.jp

Takayuki Sakai: Ex.2734t-sakai (at) civil.nagoya-u.ac.jp

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## Seminar on Geomaterial Engineering2E (2.0credits) (地盤材料工学セミナー2E)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	3 Spring Semester	3 Autumn Semester
Lecturer	Masaki NAKANO Professor	SAKAITakayuki Assistant Professor

### Course Purpose

This course introduces the latest knowledge of geotechnical engineering and geotechnical material engineering in order to acquire the foresight in civil engineering and the ability to bring out new scholarship, advanced teaching skills, deep professional skills, and an international perspective.

The goals of this course are to

- (1) Understand and explain theoretical, experimental, and numerical research methods in geotechnical engineering and geotechnical material engineering.
- (2) Understand and explain domestic and overseas research trends in related fields.

### Prerequisite Subjects

Advanced Geotechnical Engineering, Advanced Mechanics of Geomaterials, Advanced Soil Dynamics, Advanced Continuum Mechanics, Advanced Numerical Analysis, Advanced Work in Soil Mechanics and Geotechnical Engineering, Seminar on Geomaterial Engineering1A/1B/1C/1D

### Course Topics

1. Mechanical behavior of basic materials used in soil mechanics and geotechnical engineering  
Learning mainly about the mechanical behavior of typical sand, clay, and intermediate soils, and the description using elastoplastic constitutive models
2. Mechanical behavior of special soil and problematic soil  
Understanding and modeling the mechanical behavior of soil materials having weathering, expansive, and friable properties.
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Measurement to make effective usage of construction waste soil and recovered soil from disaster waste as soil material
4. Features of overseas earth materials  
Understanding the characteristics of soil generated during construction overseas and soil materials causing geological disasters.
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Understanding techniques for strengthening and stabilizing difficult-to-handle ground materials with solidified materials and short discrete fibers.

You must prepare and review materials/handouts used in seminar. In addition, you will be required to submit several report assignments, so submit them.

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The related papers will be selected and distributed as appropriate as the seminar progresses.

### Additional Reading

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### Grade Assessment

The degree of achievement of goals is comprehensively evaluated by making presentations at seminar, answering questions, contributing to discussions, and reporting on issues. The contributions are those that answer the questions and those that summarize the contents of the literature. Acceptance criteria are to be able to logically consider and discuss based on the knowledge obtained through the class, such as the



extraction and resolution of various problems in geomaterials engineering.

### Notes

No course requirements are required.

Lecture is held by ONLINE by using Zoom or Teams.

Ask questions to lecturer using E-mail.

Exchange opinions between students regarding the class using the NUCT function "Message".

### Contacting Faculty

Welcome questions during and after this seminar. Each member also accepts questions at the room and by e-mail at any time.

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Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	1 Spring Semester	1 Autumn Semester	
Lecturer	Toshihiro NODA Professor Tomohiro TOYODA Assistant Professor	Kentaro NAKAI Associate Professor	YOSHIKAWA Takahiro Assistant Professor

### Course Purpose

In order to acquire the foresight in civil engineering and the ability to bring out new academic creativity, advanced teaching skills, deep specialized skills, and an international perspective, the purpose of this seminar is to acquire the basics of geotechnical engineering, seismic engineering, and geo-disaster prevention engineering related to the safety of ground and soil structures, and to understand effective design principles and ground countermeasures. It also aims to acquire reading comprehension skills and presentation skills necessary for conducting and developing research.

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

1. Understand and explain theoretical, experimental, and numerical research methods in geotechnical engineering, seismic engineering, and geological disaster prevention engineering.
2. Understand and explain domestic and overseas research trends in related fields.

### Prerequisite Subjects

Advanced Geotechnical Engineering, Advanced Mechanics of Geomaterials, Advanced Soil Dynamics, Advanced Continuum Mechanics, Advanced Numerical Analysis, Advanced Work in Soil Mechanics and Geotechnical Engineering

### Course Topics

1. Fundamentals of soft ground mechanics
2. Deformation and stability of ground structure
3. Design method of ground and structure in soft ground
4. Design of ground reinforcement and improvement method
5. Basics of seismic engineering
6. How to create input ground motion for design
7. Seismic response analysis and seismic safety evaluation

Materials used in lectures must be prepared and reviewed. In addition, students will be required to submit several report assignments.

### Textbook

Printed documents will be distributed.

### Additional Reading

References will be introduced as necessary.

### Grade Assessment

Comprehensively evaluate the achievement of goals by making presentations at seminars, answering questions, contributing to discussions, and issue reports. Contributions include statements that answer questions and summarize the contents of the literature. Acceptance criteria are to be able to logically consider and argue based on the knowledge obtained through lectures, such as extracting and solving various problems in geotechnical engineering, seismic engineering, and geological disaster prevention engineering.

### Notes

Not required.

In principle, this lecture will be provided online using Zoom or Microsoft Teams.

### Contacting Faculty

Questions during and after the lecture are welcome. E-mail questions are also accepted at any time.

Toshihiro NODA, Ext: 3833, E-mail: noda(at)nagoya-u.jp, Bldg. 9 Rm. 317

Kentaro NAKAI, Ext: 5203, E-mail: nakai(at)civil.nagoya-u.ac.jp, Bldg. 9 Rm. 313

Takahiro YOSHIKAWA, Ext: 3834, E-mail: yoshikawa(at)civil.nagoya-u.ac.jp, Bldg. 9 Rm. 315

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Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	1 Autumn Semester	1 Spring Semester	
Lecturer	Toshihiro NODA Professor Tomohiro TOYODA Assistant Professor	Kentaro NAKAI Associate Professor	YOSHIKAWA Takahiro Assistant Professor

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### Course Purpose

In order to acquire the foresight in civil engineering and the ability to bring out new academic creativity, advanced teaching skills, deep specialized skills, and an international perspective, the purpose of this seminar is to acquire the basics of geotechnical engineering, seismic engineering, and geo-disaster prevention engineering related to the safety of ground and soil structures, and to understand effective design principles and ground countermeasures. It also aims to acquire reading comprehension skills and presentation skills necessary for conducting and developing research.

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1. Understand and explain theoretical, experimental, and numerical research methods in geotechnical engineering, seismic engineering, and geological disaster prevention engineering.
2. Understand and explain domestic and overseas research trends in related fields.

### Prerequisite Subjects

Advanced Geotechnical Engineering, Advanced Mechanics of Geomaterials, Advanced Soil Dynamics, Advanced Continuum Mechanics, Advanced Numerical Analysis, Advanced Work in Soil Mechanics and Geotechnical Engineering

### Course Topics

1. Fundamentals of soft ground mechanics
2. Deformation and stability of ground structure
3. Design method of ground and structure in soft ground
4. Design of ground reinforcement and improvement method
5. Basics of seismic engineering
6. How to create input ground motion for design
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Takahiro YOSHIKAWA, Ext: 3834, E-mail: yoshikawa(at)civil.nagoya-u.ac.jp, Bldg. 9 Rm. 315

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Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	2 Spring Semester	2 Autumn Semester	
Lecturer	Toshihiro NODA Professor Tomohiro TOYODA Assistant Professor	Kentaro NAKAI Associate Professor	YOSHIKAWA Takahiro Assistant Professor

### Course Purpose

In order to acquire the foresight in civil engineering and the ability to bring out new academic creativity, advanced teaching skills, deep specialized skills, and an international perspective, the purpose of this seminar is to acquire the basics of geotechnical engineering, seismic engineering, and geo-disaster prevention engineering related to the safety of ground and soil structures, and to understand effective design principles and ground countermeasures. It also aims to acquire reading comprehension skills and presentation skills necessary for conducting and developing research.

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2. Understand and explain domestic and overseas research trends in related fields.

### Prerequisite Subjects

Advanced Geotechnical Engineering, Advanced Mechanics of Geomaterials, Advanced Soil Dynamics, Advanced Continuum Mechanics, Advanced Numerical Analysis, Advanced Work in Soil Mechanics and Geotechnical Engineering

### Course Topics

1. Fundamentals of soft ground mechanics
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### Additional Reading

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### Grade Assessment

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### Notes

Not required.

In principle, this lecture will be provided online using Zoom or Microsoft Teams.

### Contacting Faculty

Questions during and after the lecture are welcome. E-mail questions are also accepted at any time.

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Takahiro YOSHIKAWA, Ext: 3834, E-mail: yoshikawa(at)civil.nagoya-u.ac.jp, Bldg. 9 Rm. 315

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Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Autumn Semester	2 Spring Semester
Lecturer	Toshihiro NODA Professor Tomohiro TOYODA Assistant Professor	Kentaro NAKAI Associate Professor YOSHIKAWA Takahiro Assistant Professor

### Course Purpose

In order to acquire the foresight in civil engineering and the ability to bring out new academic creativity, advanced teaching skills, deep specialized skills, and an international perspective, the purpose of this seminar is to acquire the basics of geotechnical engineering, seismic engineering, and geo-disaster prevention engineering related to the safety of ground and soil structures, and to understand effective design principles and ground countermeasures. It also aims to acquire reading comprehension skills and presentation skills necessary for conducting and developing research.

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

1. Understand and explain theoretical, experimental, and numerical research methods in geotechnical engineering, seismic engineering, and geological disaster prevention engineering.
2. Understand and explain domestic and overseas research trends in related fields.

### Prerequisite Subjects

Advanced Geotechnical Engineering, Advanced Mechanics of Geomaterials, Advanced Soil Dynamics, Advanced Continuum Mechanics, Advanced Numerical Analysis, Advanced Work in Soil Mechanics and Geotechnical Engineering

### Course Topics

1. Fundamentals of soft ground mechanics
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4. Design of ground reinforcement and improvement method
5. Basics of seismic engineering
6. How to create input ground motion for design
7. Seismic response analysis and seismic safety evaluation

Materials used in lectures must be prepared and reviewed. In addition, students will be required to submit several report assignments.

### Textbook

Printed documents will be distributed.

### Additional Reading

References will be introduced as necessary.

### Grade Assessment

Comprehensively evaluate the achievement of goals by making presentations at seminars, answering questions, contributing to discussions, and issue reports. Contributions include statements that answer questions and summarize the contents of the literature. Acceptance criteria are to be able to logically consider and argue based on the knowledge obtained through lectures, such as extracting and solving various problems in geotechnical engineering, seismic engineering, and geological disaster prevention engineering.



### Notes

Not required.

In principle, this lecture will be provided online using Zoom or Microsoft Teams.

### Contacting Faculty

Questions during and after the lecture are welcome. E-mail questions are also accepted at any time.

Toshihiro NODA, Ext: 3833, E-mail: noda(at)nagoya-u.jp, Bldg. 9 Rm. 317

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Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	3 Spring Semester	3 Autumn Semester	
Lecturer	Toshihiro NODA Professor Tomohiro TOYODA Assistant Professor	Kentaro NAKAI Associate Professor	YOSHIKAWA Takahiro Assistant Professor

### Course Purpose

In order to acquire the foresight in civil engineering and the ability to bring out new academic creativity, advanced teaching skills, deep specialized skills, and an international perspective, the purpose of this seminar is to acquire the basics of geotechnical engineering, seismic engineering, and geo-disaster prevention engineering related to the safety of ground and soil structures, and to understand effective design principles and ground countermeasures. It also aims to acquire reading comprehension skills and presentation skills necessary for conducting and developing research.

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

1. Understand and explain theoretical, experimental, and numerical research methods in geotechnical engineering, seismic engineering, and geological disaster prevention engineering.
2. Understand and explain domestic and overseas research trends in related fields.

### Prerequisite Subjects

Advanced Geotechnical Engineering, Advanced Mechanics of Geomaterials, Advanced Soil Dynamics, Advanced Continuum Mechanics, Advanced Numerical Analysis, Advanced Work in Soil Mechanics and Geotechnical Engineering

### Course Topics

1. Fundamentals of soft ground mechanics
2. Deformation and stability of ground structure
3. Design method of ground and structure in soft ground
4. Design of ground reinforcement and improvement method
5. Basics of seismic engineering
6. How to create input ground motion for design
7. Seismic response analysis and seismic safety evaluation

Materials used in lectures must be prepared and reviewed. In addition, students will be required to submit several report assignments.

### Textbook

Printed documents will be distributed.

### Additional Reading

References will be introduced as necessary.

### Grade Assessment

Comprehensively evaluate the achievement of goals by making presentations at seminars, answering questions, contributing to discussions, and issue reports. Contributions include statements that answer questions and summarize the contents of the literature. Acceptance criteria are to be able to logically consider and argue based on the knowledge obtained through lectures, such as extracting and solving various problems in geotechnical engineering, seismic engineering, and geological disaster prevention engineering.

### Notes

Not required.

In principle, this lecture will be provided online using Zoom or Microsoft Teams.

### Contacting Faculty

Questions during and after the lecture are welcome. E-mail questions are also accepted at any time.

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Takahiro YOSHIKAWA, Ext: 3834, E-mail: yoshikawa(at)civil.nagoya-u.ac.jp, Bldg. 9 Rm. 315

Please replace (at) with @.

## Seminar on Maintenance of Civil Structures 2A (2.0credits) (社会基盤維持管理学セミナー2A)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	1 Spring Semester	1 Autumn Semester	
Lecturer	KazuoTATEISHI Professor	Takeshi HANJI Associate Professor	Masaru Shimizu Assistant Professor

### Course Purpose

Through case studies in Japan and other countries, this seminar aims to acquire a wide range of knowledge on the basic design concept and safety evaluation of infrastructures, and to discuss design concept, maintenance, and long-term management method for infrastructures.

After completing this course, students will be able to:

1. understand design concepts of civil structures, and
2. improve skills on reading comprehension and presentation.

### Prerequisite Subjects

Advanced Course in Lifecycle Design of Civil Structures  
Advanced Steel Structures  
Advanced Concrete Structures  
Exercise in Inspection of Civil Structures

### Course Topics

Reading and discussing some literature on history, design and maintenance of infrastructures.

Students need to prepare the next seminar to understand basic parts and also actively join in the discussion throughout the seminar.

### Textbook

Textbooks will be determined by the supervisors.

### Additional Reading

Reference books will be determined by the supervisors.

### Grade Assessment

Evaluation will be comprehensively based on presentation and discussion among students, etc.  
Requirements to pass are to be able to actively participate in the activities at the seminar.

### Notes

No requirements.

This seminar is planning to be face-to-face type, but depending on the situation of COVID-19, it may be changed to online (Zoom or Teams) type. In this case, the information on the online seminar will be informed through NUCT.

Students who have a question on this class can contact to Takeshi HANJI (hanji(at)civil.nagoya-u.ac.jp).

### Contacting Faculty

Students are encouraged to ask questions anytime.

## Seminar on Maintenance of Civil Structures 2B (2.0credits) (社会基盤維持管理学セミナー2B)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	1 Autumn Semester	1 Spring Semester	
Lecturer	KazuoTATEISHI Professor	Takeshi HANJI Associate Professor	Masaru Shimizu Assistant Professor

### Course Purpose

Through case studies in Japan and other countries, this seminar aims to acquire a wide range of knowledge on the basic design concept and safety evaluation of infrastructures, and to discuss design concept, maintenance, and long-term management method for infrastructures.

After completing this course, students will be able to:

1. understand design concepts of civil structures, and
2. improve skills on reading comprehension and presentation.

### Prerequisite Subjects

Advanced Course in Lifecycle Design of Civil Structures  
Advanced Steel Structures  
Advanced Concrete Structures  
Exercise in Inspection of Civil Structures

### Course Topics

Reading and discussing some literature on history, design and maintenance of infrastructures.

Students need to prepare the next seminar to understand basic parts and also actively join in the discussion throughout the seminar.

### Textbook

Textbooks will be determined by the supervisors.

### Additional Reading

Reference books will be determined by the supervisors.

### Grade Assessment

Evaluation will be comprehensively based on presentation and discussion among students, etc.  
Requirements to pass are to be able to actively participate in the activities at the seminar.

### Notes

No requirements.

This seminar is planning to be face-to-face type, but depending on the situation of COVID-19, it may be changed to online (Zoom or Teams) type. In this case, the information on the online seminar will be informed through NUCT.

Students who have a question on this class can contact to Takeshi HANJI (hanji(at)civil.nagoya-u.ac.jp).

### Contacting Faculty

Students are encouraged to ask questions anytime.

## Seminar on Maintenance of Civil Structures 2C (2.0credits) (社会基盤維持管理学セミナー2C)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	2 Spring Semester	2 Autumn Semester	
Lecturer	KazuoTATEISHI Professor	Takeshi HANJI Associate Professor	Masaru Shimizu Assistant Professor

### Course Purpose

Through case studies in Japan and other countries, this seminar aims to acquire a wide range of knowledge on the basic design concept and safety evaluation of infrastructures, and to discuss design concept, maintenance, and long-term management method for infrastructures.

After completing this course, students will be able to:

- 1.understand design concepts of civil structures, and
- 2.improve skills on reading comprehension and presentation.

### Prerequisite Subjects

Advanced Course in Lifecycle Design of Civil Structures  
Advanced Steel Structures  
Advanced Concrete Structures  
Exercise in Inspection of Civil Structures

### Course Topics

Reading and discussing some literature on history, design and maintenance of infrastructures.

Students need to prepare the next seminar to understand basic parts and also actively join in the discussion throughout the seminar.

### Textbook

Textbooks will be determined by the supervisors.

### Additional Reading

Reference books will be determined by the supervisors.

### Grade Assessment

Evaluation will be comprehensively based on presentation and discussion among students, etc.  
Requirements to pass are to be able to actively participate in the activities at the seminar.

### Notes

No requirements.

This seminar is planning to be face-to-face type, but depending on the situation of COVID-19, it may be changed to online (Zoom or Teams) type. In this case, the information on the online seminar will be informed through NUCT.

Students who have a question on this class can contact to Takeshi HANJI (hanji(at)civil.nagoya-u.ac.jp).

### Contacting Faculty

Students are encouraged to ask questions anytime.

## Seminar on Maintenance of Civil Structures 2D (2.0credits) (社会基盤維持管理学セミナー2D)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	2 Autumn Semester	2 Spring Semester	
Lecturer	KazuoTATEISHI Professor	Takeshi HANJI Associate Professor	Masaru Shimizu Assistant Professor

### Course Purpose

Through case studies in Japan and other countries, this seminar aims to acquire a wide range of knowledge on the basic design concept and safety evaluation of infrastructures, and to discuss design concept, maintenance, and long-term management method for infrastructures.

After completing this course, students will be able to:

1. understand design concepts of civil structures, and
2. improve skills on reading comprehension and presentation.

### Prerequisite Subjects

Advanced Course in Lifecycle Design of Civil Structures  
Advanced Steel Structures  
Advanced Concrete Structures  
Exercise in Inspection of Civil Structures

### Course Topics

Reading and discussing some literature on history, design and maintenance of infrastructures.

Students need to prepare the next seminar to understand basic parts and also actively join in the discussion throughout the seminar.

### Textbook

Textbooks will be determined by the supervisors.

### Additional Reading

Reference books will be determined by the supervisors.

### Grade Assessment

Evaluation will be comprehensively based on presentation and discussion among students, etc.  
Requirements to pass are to be able to actively participate in the activities at the seminar.

### Notes

No requirements.

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### Contacting Faculty

Students are encouraged to ask questions anytime.

## Seminar on Maintenance of Civil Structures 2E (2.0credits) (社会基盤維持管理学セミナー2E)

Course Type	Specialized Courses		
Division at course	Doctor's Course		
Class Format	Seminar		
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate	
Starts 1	3 Spring Semester	3 Autumn Semester	
Lecturer	KazuoTATEISHI Professor	Takeshi HANJI Associate Professor	Masaru Shimizu Assistant Professor

### Course Purpose

Through case studies in Japan and other countries, this seminar aims to acquire a wide range of knowledge on the basic design concept and safety evaluation of infrastructures, and to discuss design concept, maintenance, and long-term management method for infrastructures.

After completing this course, students will be able to:

- 1.understand design concepts of civil structures, and
- 2.improve skills on reading comprehension and presentation.

### Prerequisite Subjects

Advanced Course in Lifecycle Design of Civil Structures  
Advanced Steel Structures  
Advanced Concrete Structures  
Exercise in Inspection of Civil Structures

### Course Topics

Reading and discussing some literature on history, design and maintenance of infrastructures.

Students need to prepare the next seminar to understand basic parts and also actively join in the discussion throughout the seminar.

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### Additional Reading

Reference books will be determined by the supervisors.

### Grade Assessment

Evaluation will be comprehensively based on presentation and discussion among students, etc.  
Requirements to pass are to be able to actively participate in the activities at the seminar.

### Notes

No requirements.

This seminar is planning to be face-to-face type, but depending on the situation of COVID-19, it may be changed to online (Zoom or Teams) type. In this case, the information on the online seminar will be informed through NUCT.

Students who have a question on this class can contact to Takeshi HANJI (hanji(at)civil.nagoya-u.ac.jp).

### Contacting Faculty

Students are encouraged to ask questions anytime.



## Land Design Seminar 2A (2.0credits) (国土デザイン学セミナー2A)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Autumn Semester
Lecturer	NAKAMURASHinichiro Associate Professor	

### Course Purpose

Students cultivate a capacity for understanding and expressiveness related to methodologies to create cultural, safe and secure regional and infrastructure design under the climate change and the aging society, in which technologies, institutions and policy measures are discussed within the scope of regional design, economy and public policy analysis. The goal of this lecture is for students to be able to accurately grasp the main points of academic papers and to be able to concisely summarize their contents.

### Prerequisite Subjects

Urban and Regional Planning

### Course Topics

Students review and collect the relevant advanced and recent literatures related to methodologies to create cultural, safe and secure region and infrastructure. The results are presented and discussed together with students and the supervisor. In each lecture, one or two students will give a presentation, and the student prepare the presentation in advance.

### Textbook

The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body for assessing the science related to climate change: <https://www.ipcc.ch/>

### Additional Reading

Intergovernmental Panel on Climate Change(IPCC): Fifth Assessment Report (AR5), 2014, <http://www.ipcc.ch/index.html>.

Maggie Black, Jannet King: The Atlas of Water: Mapping the World's Most Critical Resource, University of California Press(2009)

### Grade Assessment

Students are evaluated based on their presentation and discussion skills and their ability to present and discuss in the seminar. Students will be required to have an appropriate understanding of the main points of each literature and be able to provide an accurate summary.

Attendance at each seminar is a requirement for receiving credit.

### Notes

No course requirements are required.

If you take this course, please inform the instructor.

The class will be conducted off-line or remotely using Zoom.

The URL of Zoom will be informed to the students by e-mail.

All questions and exchanges will take during the lectures.

### Contacting Faculty

Sending e-mail or visiting the supervisor's office.

E-mail: [shinichiro@civil.nagoya-u.ac.jp](mailto:shinichiro@civil.nagoya-u.ac.jp)

Office: Room 305, Engineering Building No.9

## Land Design Seminar 2B (2.0credits) (国土デザイン学セミナー2B)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Autumn Semester	1 Spring Semester
Lecturer	NAKAMURASHinichiro Associate Professor	

### Course Purpose

Students cultivate a capacity for understanding and expressiveness related to methodologies to create cultural, safe and secure regional and infrastructure design under the climate change and the aging society, in which technologies, institutions and policy measures are discussed within the scope of regional design, economy and public policy analysis. The goal of this lecture is for students to be able to accurately grasp the main points of academic papers and to be able to concisely summarize their contents.

### Prerequisite Subjects

Urban and Regional Planning

### Course Topics

Students review and collect the relevant advanced and recent literatures related to methodologies to create cultural, safe and secure region and infrastructure. The results are presented and discussed together with students and the supervisor. In each lecture, one or two students will give a presentation, and the student prepare the presentation in advance.

### Textbook

The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body for assessing the science related to climate change: <https://www.ipcc.ch/>

### Additional Reading

Intergovernmental Panel on Climate Change(IPCC): Fifth Assessment Report (AR5), 2014, <http://www.ipcc.ch/index.html>.

Maggie Black, Jannet King: The Atlas of Water: Mapping the World's Most Critical Resource, University of California Press(2009)

### Grade Assessment

Students are evaluated based on their presentation and discussion skills and their ability to present and discuss in the seminar. Students will be required to have an appropriate understanding of the main points of each literature and be able to provide an accurate summary.

Attendance at each seminar is a requirement for receiving credit.

### Notes

No course requirements are required.

If you take this course, please inform the instructor.

The class will be conducted off-line or remotely using Zoom.

The URL of Zoom will be informed to the students by e-mail.

All questions and exchanges will take during the lectures.

### Contacting Faculty

Sending e-mail or visiting the supervisor's office.

E-mail: [shinichiro@civil.nagoya-u.ac.jp](mailto:shinichiro@civil.nagoya-u.ac.jp)

Office: Room 305, Engineering Building No.9

## Land Design Seminar 2C (2.0credits) (国土デザイン学セミナー2C)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Spring Semester	2 Autumn Semester
Lecturer	NAKAMURASHinichiro Associate Professor	

### Course Purpose

Students cultivate a capacity for understanding and expressiveness related to methodologies to create cultural, safe and secure regional and infrastructure design under the climate change and the aging society, in which technologies, institutions and policy measures are discussed within the scope of regional design, economy and public policy analysis. The goal of this lecture is for students to be able to accurately grasp the main points of academic papers and to be able to concisely summarize their contents.

### Prerequisite Subjects

Urban and Regional Planning

### Course Topics

Students review and collect the relevant advanced and recent literatures related to methodologies to create cultural, safe and secure region and infrastructure. The results are presented and discussed together with students and the supervisor. In each lecture, one or two students will give a presentation, and the student prepare the presentation in advance.

### Textbook

The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body for assessing the science related to climate change: <https://www.ipcc.ch/>

### Additional Reading

Intergovernmental Panel on Climate Change(IPCC): Fifth Assessment Report (AR5), 2014, <http://www.ipcc.ch/index.html>.

Maggie Black, Jannet King: The Atlas of Water: Mapping the World's Most Critical Resource, University of California Press(2009)

### Grade Assessment

Students are evaluated based on their presentation and discussion skills and their ability to present and discuss in the seminar. Students will be required to have an appropriate understanding of the main points of each literature and be able to provide an accurate summary.

Attendance at each seminar is a requirement for receiving credit.

### Notes

No course requirements are required.

If you take this course, please inform the instructor.

The class will be conducted off-line or remotely using Zoom.

The URL of Zoom will be informed to the students by e-mail.

All questions and exchanges will take during the lectures.

### Contacting Faculty

Sending e-mail or visiting the supervisor's office.

E-mail: [shinichiro@civil.nagoya-u.ac.jp](mailto:shinichiro@civil.nagoya-u.ac.jp)

Office: Room 305, Engineering Building No.9

## Land Design Seminar 2D (2.0credits) (国土デザイン学セミナー2D)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Autumn Semester	2 Spring Semester
Lecturer	NAKAMURASHinichiro Associate Professor	

### Course Purpose

Students cultivate a capacity for understanding and expressiveness related to methodologies to create cultural, safe and secure regional and infrastructure design under the climate change and the aging society, in which technologies, institutions and policy measures are discussed within the scope of regional design, economy and public policy analysis. The goal of this lecture is for students to be able to accurately grasp the main points of academic papers and to be able to concisely summarize their contents.

### Prerequisite Subjects

Urban and Regional Planning

### Course Topics

Students review and collect the relevant advanced and recent literatures related to methodologies to create cultural, safe and secure region and infrastructure. The results are presented and discussed together with students and the supervisor. In each lecture, one or two students will give a presentation, and the student prepare the presentation in advance.

### Textbook

Intergovernmental Panel on Climate Change(IPCC): Fifth Assessment Report (AR5), 2014,  
<http://www.ipcc.ch/index.html>.

Maggie Black, Jannet King: The Atlas of Water: Mapping the World's Most Critical Resource, University of California Press(2009)

### Additional Reading

Intergovernmental Panel on Climate Change(IPCC): Fifth Assessment Report (AR5), 2014,  
<http://www.ipcc.ch/index.html>.

Maggie Black, Jannet King: The Atlas of Water: Mapping the World's Most Critical Resource, University of California Press(2009)

### Grade Assessment

Students are evaluated based on their presentation and discussion skills and their ability to present and discuss in the seminar. Students will be required to have an appropriate understanding of the main points of each literature and be able to provide an accurate summary.

Attendance at each seminar is a requirement for receiving credit.

### Notes

No course requirements are required.

If you take this course, please inform the instructor.

The class will be conducted off-line or remotely using Zoom.

The URL of Zoom will be informed to the students by e-mail.

All questions and exchanges will take during the lectures.

### Contacting Faculty

Sending e-mail or visiting the supervisor's office.

E-mail: [shinichiro@civil.nagoya-u.ac.jp](mailto:shinichiro@civil.nagoya-u.ac.jp)

Office: Room 305, Engineering Building No.9

## Land Design Seminar 2E (2.0credits) (国土デザイン学セミナー2E)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	3 Spring Semester	3 Autumn Semester
Lecturer	NAKAMURASHinichiro Associate Professor	

### Course Purpose

Students cultivate a capacity for understanding and expressiveness related to methodologies to create cultural, safe and secure regional and infrastructure design under the climate change and the aging society, in which technologies, institutions and policy measures are discussed within the scope of regional design, economy and public policy analysis. The goal of this lecture is for students to be able to accurately grasp the main points of academic papers and to be able to concisely summarize their contents.

### Prerequisite Subjects

Urban and Regional Planning

### Course Topics

Students review and collect the relevant advanced and recent literatures related to methodologies to create cultural, safe and secure region and infrastructure. The results are presented and discussed together with students and the supervisor. In each lecture, one or two students will give a presentation, and the student prepare the presentation in advance.

### Textbook

Intergovernmental Panel on Climate Change(IPCC): Fifth Assessment Report (AR5), 2014,  
<http://www.ipcc.ch/index.html>.

Maggie Black, Jannet King: The Atlas of Water: Mapping the World's Most Critical Resource, University of California Press(2009)

### Additional Reading

Intergovernmental Panel on Climate Change(IPCC): Fifth Assessment Report (AR5), 2014,  
<http://www.ipcc.ch/index.html>.

Maggie Black, Jannet King: The Atlas of Water: Mapping the World's Most Critical Resource, University of California Press(2009)

### Grade Assessment

Students are evaluated based on their presentation and discussion skills and their ability to present and discuss in the seminar. Students will be required to have an appropriate understanding of the main points of each literature and be able to provide an accurate summary.

Attendance at each seminar is a requirement for receiving credit.

### Notes

No course requirements are required.

If you take this course, please inform the instructor.

The class will be conducted off-line or remotely using Zoom.

The URL of Zoom will be informed to the students by e-mail.

All questions and exchanges will take during the lectures.

### Contacting Faculty

Sending e-mail or visiting the supervisor's office.

E-mail: [shinichiro@civil.nagoya-u.ac.jp](mailto:shinichiro@civil.nagoya-u.ac.jp)

Office: Room 305, Engineering Building No.9

## Seminar on Conservation of Geoenvironment 2A (2.0credits) (地圏環境保全学セミナー2A)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Autumn Semester
Lecturer	ArataKATAYAMA Professor	KASAI Takuya Assistant Professor

### Course Purpose

The aim of this class is to understand the fundamental phenomena in relation to the pollution of soil and ground water, mechanism and modeling of pollutant behavior, microbial behavior in the environment, bioremediation and microbial synthesis technologies, external electron transfer and its microbial system, waste management and environmental risk assessment and etc.

Students are required to be able to explain critically the study by other researchers on one of the above issues, with comprehensive understanding after finding the important points by themselves and to be able to propose the own idea on the topic. Students are also requested to present their own study with the explanation of significance and problems, and to be able to propose the research plan.

### Prerequisite Subjects

Human activities and the environment, Environmental geotechnology, sanitary engineering, Social environmental conservation, microbiology, chemistry, mathematics, Hydrology, Seminar on Conservation of Geoenvironment 1A,1B, 1C & 1D and etc.

### Course Topics

Students in this class are required to present the topics in relation to the pollution of soil and ground water, mechanism and modeling of pollutant behavior, microbial behavior in the environment, bioremediation and microbial synthesis technologies, external electron transfer and its microbial system, waste management and environmental risk assessment and etc. After the presentation, the discussion is carried out.

Individual students are requested to read at least ten papers related to the topic selected, to understand the multiple approaches by different research groups, and to present the summary of the papers. The students are also requested to present their own study with comprehensive understanding of the significance and future prospects. Therefore, the preparation of the documents is requested to show the contents of presentation prior to the class and to distribute them to the participants in the class. For the presentation from other students during the class, the active participation in discussion is expected.

### Textbook

Students are required to provide the documents of the presentation, which is carried out with comprehensive understanding by reading more than ten recently-published papers on a topic in relation with pollution of soil and ground water, mechanism and modeling of pollutant behavior, microbial behavior in the environment, bioremediation and microbial synthesis technologies, external electron transfer and its microbial system, waste management and environmental risk assessment and etc. Students are also required to provide the documents of their own study with background, aim, the present problems and etc.

### Additional Reading

The presenters provide the documents in relation with the issues introduced.

### Grade Assessment

Understanding level, presentation ability, participation to the discussion: Higher than 60 points in 100 as full mark is passed.

The grade evaluation is carried out based on the accuracy of understanding on the issue selected for the presentation, on the ability to explain the issue critically, on the contribution to the discussion in every issues, and on the ability to propose the own idea.

### Notes

There is no pre-requirement for the registration.

Since, students are requested to participate in the discussions, the class will be carried out face-to-face.

Absence is not allowed unless it is difficult to participate face-to-face for unavoidable reasons.

### Contacting Faculty

The class is carried out by the student presentation and the questions. Therefore, the time for questions are provided and the discussion is carried out extensively.

Email address:

Arata Katayamaa-katayama<a>imass.nagoya-u.ac.jp

Takuya Kasaikasai.takuya<a>imass.nagoya-u.ac.jp

Please replace <a> with @ before sending email.

## Seminar on Conservation of Geoenvironment 2B (2.0credits) (地圏環境保全学セミナー-2B)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Autumn Semester	1 Spring Semester
Lecturer	ArataKATAYAMA Professor	KASAI Takuya Assistant Professor

### Course Purpose

The aim of this class is to understand the fundamental phenomena in relation to the pollution of soil and ground water, mechanism and modeling of pollutant behavior, microbial behavior in the environment, bioremediation and microbial synthesis technologies, external electron transfer and its microbial system, waste management and environmental risk assessment and etc.

Students are required to be able to explain critically the study by other researchers on one of the above issues, with comprehensive understanding after finding the important points by themselves and to be able to propose the own idea on the topic. Students are also requested to present their own study with the explanation of significance and problems, and to be able to propose the research plan.

### Prerequisite Subjects

Human activities and the environment, Environmental geotechnology, sanitary engineering, Social environmental conservation, microbiology, chemistry, mathematics, Hydrology, Seminar on Conservation of Geoenvironment 1A,1B, 1C & 1D and etc.

### Course Topics

Students in this class are required to present the topics in relation to the pollution of soil and ground water, mechanism and modeling of pollutant behavior, microbial behavior in the environment, bioremediation and microbial synthesis technologies, external electron transfer and its microbial system, waste management and environmental risk assessment and etc. After the presentation, the discussion is carried out.

Individual students are requested to read at least ten papers related to the topic selected, to understand the multiple approaches by different research groups, and to present the summary of the papers. The students are also requested to present their own study with comprehensive understanding of the significance and future prospects. Therefore, the preparation of the documents is requested to show the contents of presentation prior to the class and to distribute them to the participants in the class. For the presentation from other students during the class, the active participation in discussion is expected.

### Textbook

Students are required to provide the documents of the presentation, which is carried out with comprehensive understanding by reading more than ten recently-published papers on a topic in relation with pollution of soil and ground water, mechanism and modeling of pollutant behavior, microbial behavior in the environment, bioremediation and microbial synthesis technologies, external electron transfer and its microbial system, waste management and environmental risk assessment and etc. Students are also required to provide the documents of their own study with background, aim, the present problems and etc.

### Additional Reading

The presenters provide the documents in relation with the issues introduced.

### Grade Assessment

Understanding level, presentation ability, participation to the discussion: Higher than 60 points in 100 as full mark is passed.

The grade evaluation is carried out based on the accuracy of understanding on the issue selected for the presentation, on the ability to explain the issue critically, on the contribution to the discussion in every issues, and on the ability to propose the own idea.



### Notes

There is no pre-requirement for the registration.

Since, students are requested to participate in the discussions, the class will be carried out face-to-face.

Absence is not allowed unless it is difficult to participate face-to-face for unavoidable reasons.

### Contacting Faculty

The class is carried out by the student presentation and the questions. Therefore, the time for questions are provided and the discussion is carried out extensively.

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Spring Semester	2 Autumn Semester
Lecturer	ArataKATAYAMA Professor	KASAI Takuya Assistant Professor

### Course Purpose

The aim of this class is to understand the fundamental phenomena in relation to the pollution of soil and ground water, mechanism and modeling of pollutant behavior, microbial behavior in the environment, bioremediation and microbial synthesis technologies, external electron transfer and its microbial system, waste management and environmental risk assessment and etc.

Students are required to be able to explain critically the study by other researchers on one of the above issues, with comprehensive understanding after finding the important points by themselves and to be able to propose the own idea on the topic. Students are also requested to present their own study with the explanation of significance and problems, and to be able to propose the research plan.

### Prerequisite Subjects

Human activities and the environment, Environmental geotechnology, sanitary engineering, Social environmental conservation, microbiology, chemistry, mathematics, Hydrology, Seminar on Conservation of Geoenvironment 1A,1B, 1C & 1D and etc.

### Course Topics

Students in this class are required to present the topics in relation to the pollution of soil and ground water, mechanism and modeling of pollutant behavior, microbial behavior in the environment, bioremediation and microbial synthesis technologies, external electron transfer and its microbial system, waste management and environmental risk assessment and etc. After the presentation, the discussion is carried out.

Individual students are requested to read at least ten papers related to the topic selected, to understand the multiple approaches by different research groups, and to present the summary of the papers. The students are also requested to present their own study with comprehensive understanding of the significance and future prospects. Therefore, the preparation of the documents is requested to show the contents of presentation prior to the class and to distribute them to the participants in the class. For the presentation from other students during the class, the active participation in discussion is expected.

### Textbook

Students are required to provide the documents of the presentation, which is carried out with comprehensive understanding by reading more than ten recently-published papers on a topic in relation with pollution of soil and ground water, mechanism and modeling of pollutant behavior, microbial behavior in the environment, bioremediation and microbial synthesis technologies, external electron transfer and its microbial system, waste management and environmental risk assessment and etc. Students are also required to provide the documents of their own study with background, aim, the present problems and etc.

### Additional Reading

The presenters provide the documents in relation with the issues introduced.

### Grade Assessment

Understanding level, presentation ability, participation to the discussion: Higher than 60 points in 100 as full mark is passed.

The grade evaluation is carried out based on the accuracy of understanding on the issue selected for the presentation, on the ability to explain the issue critically, on the contribution to the discussion in every issues, and on the ability to propose the own idea.

### Notes

There is no pre-requirement for the registration.

Since, students are requested to participate in the discussions, the class will be carried out face-to-face.

Absence is not allowed unless it is difficult to participate face-to-face for unavoidable reasons.

### Contacting Faculty

The class is carried out by the student presentation and the questions. Therefore, the time for questions are provided and the discussion is carried out extensively.

## Seminar on Conservation of Geoenvironment 2D (2.0credits) (地圏環境保全学セミナー2D)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Autumn Semester	2 Spring Semester
Lecturer	ArataKATAYAMA Professor	KASAI Takuya Assistant Professor

### Course Purpose

The aim of this class is to understand the fundamental phenomena in relation to the pollution of soil and ground water, mechanism and modeling of pollutant behavior, microbial behavior in the environment, bioremediation and microbial synthesis technologies, external electron transfer and its microbial system, waste management and environmental risk assessment and etc.

Students are required to be able to explain critically the study by other researchers on one of the above issues, with comprehensive understanding after finding the important points by themselves and to be able to propose the own idea on the topic. Students are also requested to present their own study with the explanation of significance and problems, and to be able to propose the research plan.

### Prerequisite Subjects

Human activities and the environment, Environmental geotechnology, sanitary engineering, Social environmental conservation, microbiology, chemistry, mathematics, Hydrology, Seminar on Conservation of Geoenvironment 1A,1B, 1C & 1D and etc.

### Course Topics

Students in this class are required to present the topics in relation to the pollution of soil and ground water, mechanism and modeling of pollutant behavior, microbial behavior in the environment, bioremediation and microbial synthesis technologies, external electron transfer and its microbial system, waste management and environmental risk assessment and etc. After the presentation, the discussion is carried out.

Individual students are requested to read at least ten papers related to the topic selected, to understand the multiple approaches by different research groups, and to present the summary of the papers. The students are also requested to present their own study with comprehensive understanding of the significance and future prospects. Therefore, the preparation of the documents is requested to show the contents of presentation prior to the class and to distribute them to the participants in the class. For the presentation from other students during the class, the active participation in discussion is expected.

### Textbook

Students are required to provide the documents of the presentation, which is carried out with comprehensive understanding by reading more than ten recently-published papers on a topic in relation with pollution of soil and ground water, mechanism and modeling of pollutant behavior, microbial behavior in the environment, bioremediation and microbial synthesis technologies, external electron transfer and its microbial system, waste management and environmental risk assessment and etc. Students are also required to provide the documents of their own study with background, aim, the present problems and etc.

### Additional Reading

The presenters provide the documents in relation with the issues introduced.

### Grade Assessment

Understanding level, presentation ability, participation to the discussion: Higher than 60 points in 100 as full mark is passed.

The grade evaluation is carried out based on the accuracy of understanding on the issue selected for the presentation, on the ability to explain the issue critically, on the contribution to the discussion in every issues, and on the ability to propose the own idea.

### Notes

There is no pre-requirement for the registration.

Since, students are requested to participate in the discussions, the class will be carried out face-to-face.

Absence is not allowed unless it is difficult to participate face-to-face for unavoidable reasons.

### Contacting Faculty

The class is carried out by the student presentation and the questions. Therefore, the time for questions are provided and the discussion is carried out extensively.

## Seminar on Conservation of Geoenvironment 2E (2.0credits) (地圏環境保全学セミナー2E)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	3 Spring Semester	3 Autumn Semester
Lecturer	ArataKATAYAMA Professor	KASAI Takuya Assistant Professor

### Course Purpose

The aim of this class is to understand the fundamental phenomena in relation to the pollution of soil and ground water, mechanism and modeling of pollutant behavior, microbial behavior in the environment, bioremediation and microbial synthesis technologies, external electron transfer and its microbial system, waste management and environmental risk assessment and etc.

Students are required to be able to explain critically the study by other researchers on one of the above issues, with comprehensive understanding after finding the important points by themselves and to be able to propose the own idea on the topic. Students are also requested to present their own study with the explanation of significance and problems, and to be able to propose the research plan.

### Prerequisite Subjects

Human activities and the environment, Environmental geotechnology, sanitary engineering, Social environmental conservation, microbiology, chemistry, mathematics, Hydrology, Seminar on Conservation of Geoenvironment 1A,1B, 1C & 1D and etc.

### Course Topics

Students in this class are required to present the topics in relation to the pollution of soil and ground water, mechanism and modeling of pollutant behavior, microbial behavior in the environment, bioremediation and microbial synthesis technologies, external electron transfer and its microbial system, waste management and environmental risk assessment and etc. After the presentation, the discussion is carried out.

Individual students are requested to read at least ten papers related to the topic selected, to understand the multiple approaches by different research groups, and to present the summary of the papers. The students are also requested to present their own study with comprehensive understanding of the significance and future prospects. Therefore, the preparation of the documents is requested to show the contents of presentation prior to the class and to distribute them to the participants in the class. For the presentation from other students during the class, the active participation in discussion is expected.

### Textbook

Students are required to provide the documents of the presentation, which is carried out with comprehensive understanding by reading more than ten recently-published papers on a topic in relation with pollution of soil and ground water, mechanism and modeling of pollutant behavior, microbial behavior in the environment, bioremediation and microbial synthesis technologies, external electron transfer and its microbial system, waste management and environmental risk assessment and etc. Students are also required to provide the documents of their own study with background, aim, the present problems and etc.

### Additional Reading

The presenters provide the documents in relation with the issues introduced.

### Grade Assessment

Understanding level, presentation ability, participation to the discussion: Higher than 60 points in 100 as full mark is passed.

The grade evaluation is carried out based on the accuracy of understanding on the issue selected for the presentation, on the ability to explain the issue critically, on the contribution to the discussion in every issues, and on the ability to propose the own idea.

### Notes

There is no pre-requirement for the registration.

Since, students are requested to participate in the discussions, the class will be carried out face-to-face.

Absence is not allowed unless it is difficult to participate face-to-face for unavoidable reasons.

### Contacting Faculty

The class is carried out by the student presentation and the questions. Therefore, the time for questions are provided and the discussion is carried out extensively.

## Global Environmental Cooperation Seminar2A (2.0credits) (国際環境協力セミナー2A)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Autumn Semester
Lecturer	Kiichiro HAYASHI Professor	

### Course Purpose

The objective of the seminar is to study institutions, policies and assessment methods on sustainable development issues in global and local scales. The seminar will develop the applied skills of students to collect and review relevant literatures and to do research work and present the results and findings from their own perspectives, in a comprehensive manner.

The goal of this lecture is that the students will study, analyze and present a selected topic by themselves.

### Prerequisite Subjects

Civil Engineering and Policies for Developing Countries I, II, Human activities and the environment, Urban Environmental Systems Engineering, Global Environmental Cooperation Seminar1A,1B,1C,1D

### Course Topics

Students are required to study institutions and policies and assessment methods on sustainable development issues from the perspective of environmental system engineering, environmental policy study and environmental economics. Students are required to collect articles and do study by themselves and present and discuss the results of findings with teachers. Also if there is a student who needs English communication, the seminar will be conducted in English.

The students will do self-study on selected topics outside this seminar.

### Textbook

Reference documents will be provided if needed.

### Additional Reading

Reference documents will be provided if needed.

### Grade Assessment

Grading will be made taking into consideration understanding level, presentation ability, and participation to the discussion, etc.

The C grade is the minimum requirement for passing this lecture.

The success criteria is to study, analyze and present selected topics by themselves on institutions, policies and assessment methods on sustainable development issues in global and local scales

### Notes

no requirement

On site and on line lecture will be provided by teams, zoom, etc.

Questions to teacher will be by NUCT message function.

### Contacting Faculty

After the seminar and/or by e-mail.

The exchange of opinions among students will be conducted by NUCT message function.



Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Autumn Semester	1 Spring Semester
Lecturer	Kiichiro HAYASHI Professor	

### Course Purpose

The objective of the seminar is to study institutions, policies and assessment methods on sustainable development issues in global and local scales. The seminar will develop the applied skills of students to collect and review relevant literatures and to do research work and present the results and findings from their own perspectives, in a comprehensive manner.

The goal of this lecture is that the students will study, analyze and present a selected topic by themselves.

### Prerequisite Subjects

Civil Engineering and Policies for Developing Countries I, II, Human activities and the environment, Urban Environmental Systems Engineering, Global Environmental Cooperation Seminar1A,1B,1C,1D,2A

### Course Topics

Students are required to study institutions and policies and assessment methods on sustainable development issues from the perspective of environmental system engineering, environmental policy study and environmental economics. Students are required to collect articles and do study by themselves and present and discuss the results of findings with teachers. Also if there is a student who needs English communication, the seminar will be conducted in English.

The students will do self-study on selected topics outside this seminar.

### Textbook

Reference documents will be provided if needed.

### Additional Reading

Reference documents will be provided if needed.

### Grade Assessment

Grading will be made taking into consideration understanding level, presentation ability, and participation to the discussion, etc.

The C grade is the minimum requirement for passing this lecture.

The success criteria is to study, analyze and present selected topics by themselves on institutions, policies and assessment methods on sustainable development issues in global and local scales

### Notes

no requirement

Onsite and on line lecture will be provided by teams, zoom, etc.

Questions to teacher will be by NUCT message function.

### Contacting Faculty

After the class and/or by e-mail.

The exchange of opinions among students will be conducted by NUCT message function.

## Global Environmental Cooperation Seminar2C (2.0credits) (国際環境協力セミナー2C)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Spring Semester	2 Autumn Semester
Lecturer	Kiichiro HAYASHI Professor	

### Course Purpose

The objective of the seminar is to study institutions, policies and assessment methods on sustainable development issues in global and local scales. The seminar will develop the applied skills of students to collect and review relevant literatures and to do research work and present the results and findings from their own perspectives, in a comprehensive manner.

The goal of this lecture is that the students will study, analyze and present a selected topic by themselves.

### Prerequisite Subjects

Civil Engineering and Policies for Developing Countries I, II, Human activities and the environment, Urban Environmental Systems Engineering, Global Environmental Cooperation Seminar1A,1B,1C,1D,2A,2B

### Course Topics

Students are required to study institutions and policies and assessment methods on sustainable development issues from the perspective of environmental system engineering, environmental policy study and environmental economics. Students are required to collect articles and do study by themselves and present and discuss the results of findings with teachers. Also if there is a student who needs English communication, the seminar will be conducted in English.

The students will do self-study on selected topics outside this seminar.

### Textbook

Reference documents will be provided if needed.

### Additional Reading

Reference documents will be provided if needed.

### Grade Assessment

Grading will be made taking into consideration understanding level, presentation ability, and participation to the discussion, etc.

The C grade is the minimum requirement for passing this lecture.

The success criteria is to study, analyze and present selected topics by themselves on institutions, policies and assessment methods on sustainable development issues in global and local scales

### Notes

no requirement

On site and on line lecture will be provided by teams, zoom, etc.

Questions to teacher will be by NUCT message function.

### Contacting Faculty

After the seminar and/or by e-mail.

The exchange of opinions among students will be conducted by NUCT message function.

## Global Environmental Cooperation Seminar2D (2.0credits) (国際環境協力セミナー2D)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Autumn Semester	2 Spring Semester
Lecturer	Kiichiro HAYASHI Professor	

### Course Purpose

The objective of the seminar is to study institutions, policies and assessment methods on sustainable development issues in global and local scales. The seminar will develop the applied skills of students to collect and review relevant literatures and to do research work and present the results and findings from their own perspectives, in a comprehensive manner.

The goal of this lecture is that the students will study, analyze and present a selected topic by themselves.

### Prerequisite Subjects

Civil Engineering and Policies for Developing Countries I, II, Human activities and the environment, Urban Environmental Systems Engineering, Global Environmental Cooperation Seminar1A,1B,1C,1D,2A,2B,2C

### Course Topics

Students are required to study institutions and policies and assessment methods on sustainable development issues from the perspective of environmental system engineering, environmental policy study and environmental economics. Students are required to collect articles and do study by themselves and present and discuss the results of findings with teachers. Also if there is a student who needs English communication, the seminar will be conducted in English.

The students will do self-study on selected topics outside this seminar.

### Textbook

Reference documents will be provided if needed.

### Additional Reading

Reference documents will be provided if needed.

### Grade Assessment

Grading will be made taking into consideration understanding level, presentation ability, and participation to the discussion, etc.

The C grade is the minimum requirement for passing this lecture.

The success criteria is to study, analyze and present selected topics by themselves on institutions, policies and assessment methods on sustainable development issues in global and local scales

### Notes

no requirement

On site and on line lecture will be provided by teams, zoom, etc.

Questions to teacher will be by NUCT message function.

### Contacting Faculty

After the seminar and/or by e-mail.

The exchange of opinions among students will be conducted by NUCT message function.

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	3 Spring Semester	3 Autumn Semester
Lecturer	Kiichiro HAYASHI Professor	

### Course Purpose

The objective of the seminar is to study institutions, policies and assessment methods on sustainable development issues in global and local scales. The seminar will develop the applied skills of students to collect and review relevant literatures and to do research work and present the results and findings from their own perspectives, in a comprehensive manner.

The goal of this lecture is that the students will study, analyze and present a selected topic by themselves.

### Prerequisite Subjects

Civil Engineering and Policies for Developing Countries I, II, Human activities and the environment, Urban Environmental Systems Engineering, Global Environmental Cooperation Seminar1A,1B,1C,1D,2A,2B,2C,2D

### Course Topics

Students are required to study institutions and policies and assessment methods on sustainable development issues from the perspective of environmental system engineering, environmental policy study and environmental economics. Students are required to collect articles and do study by themselves and present and discuss the results of findings with teachers. Also if there is a student who needs English communication, the seminar will be conducted in English.

The students will do self-study on selected topics outside this seminar.

### Textbook

Reference documents will be provided if needed.

### Additional Reading

Reference documents will be provided if needed.

### Grade Assessment

Grading will be made taking into consideration understanding level, presentation ability, and participation to the discussion, etc.

The C grade is the minimum requirement for passing this lecture.

The success criteria is to study, analyze and present selected topics by themselves on institutions, policies and assessment methods on sustainable development issues in global and local scales

### Notes

no requirement

On site and on line lecture will be provided by teams, zoom, etc.

Questions to teacher will be by NUCT message function.

### Contacting Faculty

After the seminar and/or by e-mail.

The exchange of opinions among students will be conducted by NUCT message function.

## Seminar on Environmental Ecology System2A (2.0credits) (環境エコロジーシステムセミナー2A)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Spring Semester	1 Autumn Semester
Lecturer	Toshiyuki YAMAMOTO Professor	Tomio MIWA Associate Professor

### Course Purpose

Learn travel behavior analysis, transportation planning, transport and environment dynamics, etc. in order to understand policies for environmental sustainability and related issues.

The purpose of this class is to obtain the knowledge and ability to discuss issues concerned with environmentally sustainable transport such as travel behavior analysis, transportation planning, and transport environment dynamics.

### Prerequisite Subjects

History of City and Civilization, Probability and Statistics, Spatial Planning, Transportation Planning, Infrastructure Planning, Urban and National Land Planning

### Course Topics

Discuss on methodological issues concerned with environmentally sustainable transport such as travel behavior analysis, transportation planning, transport environment dynamics, etc. with the aid of reading advanced English literature.

Presentation team reads the assigned part and prepare the presentation. Questioning team also reads the part and prepare the questions to the presentation team.

### Textbook

To be announced

### Additional Reading

Introduced according to the process of the lecture.

### Grade Assessment

Understanding of issues on environmentally sustainable transport such as travel behavior analysis, transportation planning, and transport environment dynamics.

Presentation and active participation to the class (including questions and comments to presentations of other groups) are evaluated and 60 of 100 points are required to pass.

### Notes

Not required

Class is conducted through online as on-demand.

URL is informed by email.

If you have any questions about this class, please contact Yamamoto (yamamoto(at)civil.nagoya-u.ac.jp) or Miwa (miwa(at)nagoya-u.jp).

(please exchange "(at)" to "@")

### Contacting Faculty

Students can ask questions to professors at any time during classes.

Questions during off-class hours can be asked via e-mail: yamamoto(at)civil.nagoya-u.ac.jp and miwa(at)nagoya-u.jp

## Seminar on Environmental Ecology System2B (2.0credits) (環境エコロジーシステムセミナー2B)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	1 Autumn Semester	1 Spring Semester
Lecturer	Toshiyuki YAMAMOTO Professor	Tomio MIWA Associate Professor

### Course Purpose

Learn travel behavior analysis, transportation planning, transport and environment dynamics, etc. in order to understand policies for environmental sustainability and related issues.

The purpose of this class is to obtain the knowledge and ability to discuss issues concerned with environmentally sustainable transport such as travel behavior analysis, transportation planning, and transport environment dynamics.

### Prerequisite Subjects

History of City and Civilization, Probability and Statistics, Spatial Planning, Transportation Planning, Infrastructure Planning, Urban and National Land Planning

### Course Topics

Discuss on methodological issues concerned with environmentally sustainable transport such as travel behavior analysis, transportation planning, transport environment dynamics, etc. with the aid of reading advanced English literature.

Presentation team reads the assigned part and prepare the presentation. Questioning team also reads the part and prepare the questions to the presentation team.

### Textbook

To be announced

### Additional Reading

Introduced according to the process of the lecture.

### Grade Assessment

Understanding of issues on environmentally sustainable transport such as travel behavior analysis, transportation planning, and transport environment dynamics.

Presentation and active participation to the class (including questions and comments to presentations of other groups) are evaluated and 60 of 100 points are required to pass.

### Notes

Not required

Class is conducted through online as on-demand.

URL is informed by email.

If you have any questions about this class, please contact Yamamoto (yamamoto(at)civil.nagoya-u.ac.jp) or Miwa (miwa(at)nagoya-u.jp).

(please exchange "(at)" to "@")

### Contacting Faculty

Students can ask questions to professors at any time during classes.

Questions during off-class hours can be asked via e-mail: yamamoto(at)civil.nagoya-u.ac.jp and miwa(at)nagoya-u.jp

## Seminar on Environmental Ecology System2C (2.0credits) (環境エコロジーシステムセミナー2C)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Spring Semester	2 Autumn Semester
Lecturer	Toshiyuki YAMAMOTO Professor	Tomio MIWA Associate Professor

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### Course Purpose

Learn travel behavior analysis, transportation planning, transport and environment dynamics, etc. in order to understand policies for environmental sustainability and related issues.

The purpose of this class is to obtain the knowledge and ability to discuss issues concerned with environmentally sustainable transport such as travel behavior analysis, transportation planning, and transport environment dynamics.

### Prerequisite Subjects

History of City and Civilization, Probability and Statistics, Spatial Planning, Transportation Planning, Infrastructure Planning, Urban and National Land Planning

### Course Topics

Discuss on methodological issues concerned with environmentally sustainable transport such as travel behavior analysis, transportation planning, transport environment dynamics, etc. with the aid of reading advanced English literature.

Presentation team reads the assigned part and prepare the presentation. Questioning team also reads the part and prepare the questions to the presentation team.

### Textbook

To be announced

### Additional Reading

Introduced according to the process of the lecture.

### Grade Assessment

Understanding of issues on environmentally sustainable transport such as travel behavior analysis, transportation planning, and transport environment dynamics.

Presentation and active participation to the class (including questions and comments to presentations of other groups) are evaluated and 60 of 100 points are required to pass.

### Notes

Not required

Class is conducted through online as on-demand.

URL is informed by email.

If you have any questions about this class, please contact Yamamoto (yamamoto(at)civil.nagoya-u.ac.jp) or Miwa (miwa(at)nagoya-u.jp).

(please exchange "(at)" to "@")

### Contacting Faculty

Students can ask questions to professors at any time during classes.

Questions during off-class hours can be asked via e-mail: yamamoto(at)civil.nagoya-u.ac.jp and miwa(at)nagoya-u.jp

## Seminar on Environmental Ecology Systems2D (2.0credits) (環境エコロジーシステムセミナー2D)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	2 Autumn Semester	2 Spring Semester
Lecturer	Toshiyuki YAMAMOTO Professor	Tomio MIWA Associate Professor

### Course Purpose

Learn travel behavior analysis, transportation planning, transport and environment dynamics, etc. in order to understand policies for environmental sustainability and related issues.

The purpose of this class is to obtain the knowledge and ability to discuss issues concerned with environmentally sustainable transport such as travel behavior analysis, transportation planning, and transport environment dynamics.

### Prerequisite Subjects

History of City and Civilization, Probability and Statistics, Spatial Planning, Transportation Planning, Infrastructure Planning, Urban and National Land Planning

### Course Topics

Discuss on methodological issues concerned with environmentally sustainable transport such as travel behavior analysis, transportation planning, transport environment dynamics, etc. with the aid of reading advanced English literature.

Presentation team reads the assigned part and prepare the presentation. Questioning team also reads the part and prepare the questions to the presentation team.

### Textbook

To be announced

### Additional Reading

Introduced according to the process of the lecture.

### Grade Assessment

Understanding of issues on environmentally sustainable transport such as travel behavior analysis, transportation planning, and transport environment dynamics.

Presentation and active participation to the class (including questions and comments to presentations of other groups) are evaluated and 60 of 100 points are required to pass.

### Notes

Not required

Class is conducted through online as on-demand.

URL is informed by email.

If you have any questions about this class, please contact Yamamoto (yamamoto(at)civil.nagoya-u.ac.jp) or Miwa (miwa(at)nagoya-u.jp).

(please exchange "(at)" to "@")

### Contacting Faculty

Students can ask questions to professors at any time during classes.

Questions during off-class hours can be asked via e-mail: yamamoto(at)civil.nagoya-u.ac.jp and miwa(at)nagoya-u.jp



## Seminar on Environmental Ecology System2E (2.0credits) (環境エコロジーシステムセミナー2E)

Course Type	Specialized Courses	
Division at course	Doctor's Course	
Class Format	Seminar	
Course Name	Civil and Environmental Engineering	Civil and Environmental Engineering Graduate
Starts 1	3 Spring Semester	3 Autumn Semester
Lecturer	Toshiyuki YAMAMOTO Professor	Tomio MIWA Associate Professor

### Course Purpose

Learn travel behavior analysis, transportation planning, transport and environment dynamics, etc. in order to understand policies for environmental sustainability and related issues.

The purpose of this class is to obtain the knowledge and ability to discuss issues concerned with environmentally sustainable transport such as travel behavior analysis, transportation planning, and transport environment dynamics.

### Prerequisite Subjects

History of City and Civilization, Probability and Statistics, Spatial Planning, Transportation Planning, Infrastructure Planning, Urban and National Land Planning

### Course Topics

Discuss on methodological issues concerned with environmentally sustainable transport such as travel behavior analysis, transportation planning, transport environment dynamics, etc. with the aid of reading advanced English literature.

Presentation team reads the assigned part and prepare the presentation. Questioning team also reads the part and prepare the questions to the presentation team.

### Textbook

To be announced

### Additional Reading

Introduced according to the process of the lecture.

### Grade Assessment

Understanding of issues on environmentally sustainable transport such as travel behavior analysis, transportation planning, and transport environment dynamics.

Presentation and active participation to the class (including questions and comments to presentations of other groups) are evaluated and 60 of 100 points are required to pass.

### Notes

Not required

Class is conducted through online as on-demand.

URL is informed by email.

If you have any questions about this class, please contact Yamamoto (yamamoto(at)civil.nagoya-u.ac.jp) or Miwa (miwa(at)nagoya-u.jp).

(please exchange "(at)" to "@")

### Contacting Faculty

Students can ask questions to professors at any time during classes.

Questions during off-class hours can be asked via e-mail: yamamoto(at)civil.nagoya-u.ac.jp and miwa(at)nagoya-u.jp

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

### 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

#### Contacting Faculty

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

## Global Research Internship 2 (2.0credits) (グローバル研究インターンシップ2)

Course Type	Specialized Courses
Division at course	Doctor's Course
Class Format	Exercise
Course Name	Civil and Environmental Engineering      Civil and Environmental Engineering Graduate
Starts 1	1 Spring and Autumn Semester
Lecturer	Associated Faculty

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### Course Purpose

As part of the Forefront Studies Program and the Nagoya University Global Environmental Leaders Program (NUGELP), this course aims at providing students with research-based internship opportunities at universities, research institutions, companies, governmental and non-governmental organizations in Japan and overseas to acquire the ability to conduct practical and applied research.

After completing this course, students will be able to:

- 1.explain various issues in civil engineering fields in Japan, as well as overseas, and
- 2.acquire a comprehensive methodology for executing projects in infrastructure development.

### Prerequisite Subjects

Students are expected to have taken some lectures offered by the Forefront Studies Program and the Nagoya University Global Environmental Leaders Program (NUGELP).

### Course Topics

Students are expected to acquire practical research know-how through On-site Research Training (ORT).

Course Schedule:

- Step 1: Initial Proposal Submission
- Step 2: Detailed Proposal Submission
- Step 3: Internship
- Step 4: Final Report Submission

Submit the proposal and report by the due date, and report details of your internship as the final report. The period and terms of implementation should be decided thorough consultation with academic advisor(s) and experts at host institutions.

### Textbook

Textbooks will be recommended at the right time.

### Additional Reading

Reference books will be recommended at the right time.

### Grade Assessment

All reports will be evaluated comprehensively, and the ability to discuss the knowledge and experience gained through the internship will be the criterion for passing the course.

### Notes

No prerequisite

### Contacting Faculty

Nagoya University Civil and Environmental Engineering  
International Programs Office  
Room 223, Environmental Studies Hall  
Email: ceeipo@urban.env.nagoya-u.ac.jp  
Ex: 5507

## 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	Shinji DOKI Professor		

### Course Purpose

While attendance is raw, in "the innovation experience project," I stand with a company engineer (DP, Directing Professor) and carry an assistance, DP of the attendance straight instruction by the DP and the role of the interface of the attendance student. In this way, it is intended to let you do experience of the project management.

I aim for planning a researcher, improvement of the nature as the leader, the expansion of the field of vision by a simulated experience of instruction of the attendance life and the business management in the real world.

### Prerequisite Subjects

"Innovation Practice Course" 75 hours(Principle one day a week)

### Course Topics

In "the innovation experience project," I assist the project promotion by the DP.

Help of the understanding of a project theme and contents for the attendance life of various specialisms

I compile an opinion of the attendance life and let you make a purpose, the method of the project clear

Exchange of opinions between the attendance life, instruction, report of the discussion

Communication adjustment that DP and attendance are raw

I assume this a main component.

In addition, correspondence out of the lecture time is necessary when preparations, an investigation to affect project accomplishment are necessary.

### Textbook

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

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

### Additional Reading

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

### Grade Assessment

I evaluate it through accomplishment, the discussion of the project. If display of leadership, report ability and the leadership is accepted, it is said that I pass.

### Notes

No specific requirements.

### Contacting Faculty

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



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

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

**Course Purpose**

The purpose of this course is to provide guidance to semester students for advanced science and engineering experiments at the Venture Business Laboratory. Through this research guidance, students will be able to play a comprehensive role as a researcher / educator and instructor in the field in charge of device process system and device simulation, and will be able to provide research guidance. Useful for practical training as a research leader.

**Prerequisite Subjects**

Knowledge of the field in charge selected from the fields of electronic device process system and device simulation.

**Course Topics**

In the student experiment, the instructor students provide guidance to attendant students on subject research and original research from the field of electronic device process system and device simulation with the professional teacher. Together with the attendant students, they perform practical use these equipment and software and get the results. They experience the leadership of the research, providing research guidance, report preparation guidance, and presentation guidance.

**Textbook**

Required documents is distributed.

**Additional Reading**

Required documents is distributed.

### Grade Assessment

Evaluate by compiling experiments / exercises, teaching (70%), and interviewing (30%). Students who understand each device and software and give appropriate guidance are accepted, and their research results and new approaches are highly evaluated. A score of 60 or more out of 100 is a passing score.

### Notes

To have a deep understanding in one field from electronic device process and device simulation.

### Contacting Faculty

Arranging the schedules by e-mail and etc.

## Research Internship2 U2 (2.0credits) (研究インターンシップ2 U2)

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

### Course Purpose

Research internship is different from conventional internship for a working experience. Staffs in the faculty and instructors in a company cooperate with each other to set up research themes adequate to the doctoral course, and supervise a long-term internship for 1-6 months. This course aims at training of a person who has ability for an advanced research and development in not only a specialized field but also a multidisciplinary field, and a leader capable of making a proper judgment in a research project.

### Prerequisite Subjects

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

### Course Topics

A student applies for a theme for research set up under the cooperation of a company and Nagoya University. Students should attend at the lecture at the university on the duty of confidentiality and the protection of intellectual property rights before starting the internship.

### Textbook

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

### Additional Reading

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

### Grade Assessment

The credits will be given to the students who have had the working days less than or equal to 20 days in the internship company.

### Notes

No specific requirements.

### Contacting Faculty

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

**Research Internship2 U3 (3.0credits) (研究インターンシップ2 U3)**

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

**Course Purpose**

Research internship is different from conventional internship for a working experience. Staffs in the faculty and instructors in a company cooperate with each other to set up research themes adequate to the doctoral course, and supervise a long-term internship for 1-6 months. This course aims at training of a person who has ability for an advanced research and development in not only a specialized field but also a multidisciplinary field, and a leader capable of making a proper judgment in a research project.

**Prerequisite Subjects**

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

**Course Topics**

A student applies for a theme for research set up under the cooperation of a company and Nagoya University. Students should attend at the lecture at the university on the duty of confidentiality and the protection of intellectual property rights before starting the internship.

**Textbook**

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

**Additional Reading**

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

**Grade Assessment**

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

**Notes**

No specific requirements.

**Contacting Faculty**

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

## Research Internship2 U4 (4.0credits) (研究インターンシップ2 U4)

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

### Course Purpose

Research internship is different from conventional internship for a working experience. Staffs in the faculty and instructors in a company cooperate with each other to set up research themes adequate to the doctoral course, and supervise a long-term internship for 1-6 months. This course aims at training of a person who has ability for an advanced research and development in not only a specialized field but also a multidisciplinary field, and a leader capable of making a proper judgment in a research project.

### Prerequisite Subjects

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

### Course Topics

A student applies for a theme for research set up under the cooperation of a company and Nagoya University. Students should attend at the lecture at the university on the duty of confidentiality and the protection of intellectual property rights before starting the internship.

### Textbook

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

### Additional Reading

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

### Grade Assessment

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

**Notes**

No specific requirements.

**Contacting Faculty**

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



Research Internship2 U6 (6.0credits) (研究インターンシップ2 U6)

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

### Course Purpose

Research internship is different from conventional internship for a working experience. Staffs in the faculty and instructors in a company cooperate with each other to set up research themes adequate to the doctoral course, and supervise a long-term internship for 1-6 months. This course aims at training of a person who has ability for an advanced research and development in not only a specialized field but also a multidisciplinary field, and a leader capable of making a proper judgment in a research project.

### Prerequisite Subjects

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

### Course Topics

A student applies for a theme for research set up under the cooperation of a company and Nagoya University. Students should attend at the lecture at the university on the duty of confidentiality and the protection of intellectual property rights before starting the internship.

### Textbook

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

### Additional Reading

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

### Grade Assessment

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

**Notes**

No specific requirements.

**Contacting Faculty**

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

**Research Internship2 U8 (8.0credits) (研究インターンシップ2 U8)**

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

**Course Purpose**

Research internship is different from conventional internship for a working experience. Staffs in the faculty and instructors in a company cooperate with each other to set up research themes adequate to the doctoral course, and supervise a long-term internship for 1-6 months. This course aims at training of a person who has ability for an advanced research and development in not only a specialized field but also a multidisciplinary field, and a leader capable of making a proper judgment in a research project.

**Prerequisite Subjects**

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

**Course Topics**

A student applies for a theme for research set up under the cooperation of a company and Nagoya University. Students should attend at the lecture at the university on the duty of confidentiality and the protection of intellectual property rights before starting the internship.

**Textbook**

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

**Additional Reading**

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

**Grade Assessment**

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

**Notes**

No specific requirements.

**Contacting Faculty**

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