Advanced Regional Revitalization, Fostering of Responsible Researchers & Innovation of Future Generations, Promotion of Multicultural Coexistence

Registration code	81006	**Credits**	2
Instructor	HAYASHI Masahide, SATO Satoru, NISHIYAMA Masateru	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Lecture	**Target major**	All areas
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

This course is designed to cultivate in first-year students of the Master's Program the rich human skills necessary to accurately grasp the issues that constantly arise and to resolve them for the future in order to respond to changes in the region and to the progress of globalization.
The three main themes of this course are "Regional Development," "Next Generation Formation," and "Multicultural Conviviality," and four lectures will be given on each of these themes. By linking the three themes to the SDGs, the lectures will make clear that various issues related to "regional development," "next generation formation," and "multicultural conviviality" are consistent issues in the modern era.
In addition, through lectures, students will experience how researchers and practitioners are dealing with various issues in science, technology, and society against the background of regional revitalization and globalization, based on their own ideas. This will allow students to envision their own future visions and, by backcasting from those visions, to think about how they will study at university. By asking students to clearly state the relationship between their research activities (and their future visions) in their final reports, we cultivate an awareness of the social significance and role of research, and the ability and qualities to explain this to others.

・Course Category (Relations to DP, CP and other courses)

All first-year students in the Master's course will work on common issues in each lecture across the graduate school and majors to gain a bird's-eye view of the world, which will form the basis for cooperation in developing their own expertise in society beyond the boundaries of their field of study.

・Contents

The course method for each theme consists of an introductory lecture for each theme and lectures given by experts and practitioners based on the lectures. By understanding the content of the lectures and lectures for each theme and working on minute papers and final reports for each lecture, students will cultivate the ability to think about science, technology, and society as well as their own expertise from a bird's eye viewpoint. Students are expected to engage in independent research in each lecture and literature survey, etc. so that they can explain their own understanding and approaches to "regional development," "next generation formation," and "multicultural conviviality" to others, while being aware of the relevance of their own studies to their own expertise in their final reports.

1st Guidance
2nd-5th Lectures and presentations on Theme 1 "Regional Development" and "Regional Development and SDGs
Lectures on Theme 2 "Formation of the Next Generation" and "Formation of the Next Generation and the SDGs" and a lecture on "Research Ethics" will be given.
Lectures and presentations on Theme 3 "Multicultural Conviviality" and "SDGs and Multicultural Conviviality" will be given.
14th-15th Preparation of final reports, publication, and review
Submitted reports will be opened to the students, and mutual evaluation and critique will be conducted to exchange opinions.

・Evaluation

The degree of mastery will be evaluated based on a comprehensive evaluation of the minute papers on the lectures given by external lecturers and internal faculty members, and the final report (documents and reports). The criterion for passing the course is that the student has achieved the basic level of each of the objectives.
The total score of the minute paper (45%) and the final report (55%) will be used as the grade.

・Notice for Students

As stated in the achievement objectives, students are expected to be interested in topics in other fields that they come into contact with for the first time, and to feed this knowledge back to their own studies, without limiting themselves to their own specialized fields. In addition, students are expected to express their own ideas explicitly through minute papers and final reports for each lecture.
Advice for study outside of class time (preparation/revision)
As stated in the achievement objectives, students are expected to digest the frontiers of science, technology, and social issues that lead to the three themes: regional development, next generation formation, and multicultural conviviality, and to strive to explain to others their understanding based on their own research and organization of that research, both in and outside the lecture time.

Textbook	NA
Reference book	NA
Contact	Anytime (e-mail)

Intensive Scientific Communication Course in English

Registration code	61005	**Credits**	1
Instructor	Edmund FEC	**Coordinator** in case of invited lectures	WATANABE Toru
Academic year	1st year	**Semester**	Year-round
Style of course	Seminar	**Target major**	All areas
How to use English	Full use		

・Purpose and Learning Goals

This course will include practice of all 4 skills: reading, writing, listening and speaking. These skills will be practiced through discussions and other task-based learning.
To be able to discuss both scientific and non-scientific topics in English.

・Course Category (Relations to DP, CP and other courses)

This course contributes to a diploma policy of Department of Agricultural Sciences: To be able to extract/identify challenges in one’s field of specialization in international and local communities and engage in research/development to solve these challenges

・Contents

In this 8-week course, students will be taught in a mixture of task-based learning and article-based discussions based on the PDR method (Preparation, Discussion and Reaction).
Lesson 1. Self-introductions
Lesson 2. PDR - Insects
Lesson 3. UK: history and discussion
Lesson 4. Self-selected PDR #1
Lesson 5. UK life and culture
Lesson 6. Self-selected PDR #2
Lesson 7. US & UK English
Lesson 8. Self-selected PDR #3

・Evaluation

According to the goal, the criteria is to be able to discuss both scientific and non-scientific topics in English.
Students will be graded on their active participation in class (20%) and their Preparation, Discussion and Reaction scores for each PDR discussion (20% X 4).

・Notice for Students

This is a discussion-based course which will involve research, preparation, discussion and written reports ("reactions"). It will be important to prepare not only the material for discussion, but also to check how to talk about it in English. Students should be prepared to use dictionaries to check their pronunciation in order to have effective discussions.
Students will need to research journal and newspaper articles and prepare questions for discussion. The preparation for the 4 PDR discussions will take up most of the homework time.

Textbook	NA
Reference book	NA
Contact	Students can contact the teacher at: edmundfec@gmail.com

International Understanding (Domestic Seminar)

Registration code	61950	**Credits**	1
Instructor	Academic Affairs Committee Chairperson	**Coordinator** in case of invited lectures	Teacher leading the program
Academic year	1st and 2nd year	**Semester**	Summer or Winter
Style of course	Seminar	**Target major**	All areas
How to use English	Full use		

・Purpose and Learning Goals

Through domestic training conducted together with international students, students acquire international knowledge and values. It will also lead to academic and international networking among students.
By learning various things together with international students through training in Japan, you will be able to come into contact with different cultures and values, improve your cross-cultural communication skills, and develop your understanding and imagination with a broader perspective.

・Course Category (Relations to DP, CP and other courses)

This subject is domestic training and a practical subject in order to make the learning results useful in social and professional life (curriculum policy of the agricultural science major)

・Contents

[Class method]
When international students from overseas universities (not limited to partner universities) come to Japan, we conduct domestic training (programs for domestic training) of 3 days or more.
Please note that accommodation may be required.
[Class schedule]
Programs for domestic training will be announced on bulletin boards.

・Evaluation

Participants will be evaluated based on their proactive approach to the challenges presented during the training, the content of their presentations and report assignments, and their ability to collaborate with participants.
A comprehensive evaluation will be made based on the training records, training results report, and training results and level of achievement as seen by the instructor.

・Notice for Students

In addition to acquiring knowledge and skills during the training, students will strive to communicate in English during the training period.
In order to encourage active participation, we will ask participants to prepare materials related to the training content in English in advance and give a simple presentation, so we would like them to use the library or the Internet to gather information and engage in preparatory learning.
[Notes]
(1) The program for domestic training is planned and implemented by a leading teacher, so if there is no teacher planning this program, this subject will not be offered.
(2) Transportation expenses to the training site and accommodation expenses if overnight stays are required during the training are to be paid by the participants themselves. However, depending on the domestic training program, subsidies may be available, so please check with your instructor.

Textbook	In this class, the instructor will distribute slides and handouts created by the instructor, and introduce textbooks and reference books as needed.
Reference book	In this class, the instructor will distribute slides and handouts created by the instructor, and introduce textbooks and reference books as needed.
Contact	Use WebClass, etc. to contact and inquire about your instructor.

Seminar on Crop Science (1st year summer semester)

Registration code	61154	**Credits**	2
Instructor	NASUKAWA Hisashi	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target major**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

To link current research with previous research, we will deepen our understanding of recent crop production trends by organizing domestic and international research.

-To understand and explain terminology and experimental methods used in papers [Knowledge/Understanding]
-To organize and summarize the content of a paper [skills]
-To understand the content of the paper and comprehensively discuss the validity of the research [Attitudes/habits]

・Course Category (Relations to DP, CP and other courses)

We encourage students to actively participate in the class so that they develop skills to independently identify the challenges and present a beneficial resolution to these challenges(Curriculum Policy).

・Contents

1st Guidance
2nd-14th: Introduction to academic papers
Pick up and present an academic paper that includes the following content.
-Relationship between plant inorganic components and crop production
-Relationship between soil nutrients and crop production
-Relationship between meteorological factors and crop production
-Root system of crops
-Utilization of geographic information systems in crop production
-Crop growth evaluation and simulation model
-Crop production technology that responds to climate change
15th Final evaluation

・Evaluation

Evaluation of participants would be done based on attendance, participation, and presentations.

・Notice for Students

Presenters should use PowerPoint to summarize the points of the paper they are introducing in an easy-to-understand manner and explain how it relates to their research. Audiences are encouraged to understand the content of the presentation and actively ask questions.

Textbook	NA
Reference book	NA
Contact	anytime

Seminar on Crop Science (1st year winter semester)

Registration code	61155	**Credits**	2
Instructor	NASUKAWA Hisashi	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target major**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

To link current research with previous research, we will deepen our understanding of recent crop production trends by organizing domestic and international research.

-To understand and explain terminology and experimental methods used in papers [Knowledge/Understanding]
-To organize and summarize the content of a paper [skills]
-To understand the content of the paper and comprehensively discuss the validity of the research [Attitudes/habits]

・Course Category (Relations to DP, CP and other courses)

We encourage students to actively participate in the class so that they develop skills to independently identify the challenges and present a beneficial resolution to these challenges(Curriculum Policy).

・Contents

1st Guidance
2nd-14th: Introduction to academic papers
Pick up and present an academic paper that includes the following content.
-Relationship between plant inorganic components and crop production
-Relationship between soil nutrients and crop production
-Relationship between meteorological factors and crop production
-Root system of crops
-Utilization of geographic information systems in crop production
-Crop growth evaluation and simulation model
-Crop production technology that responds to climate change
15th Final evaluation

・Evaluation

Evaluation of participants would be done based on attendance, participation, and presentations.

・Notice for Students

Presenters should use PowerPoint to summarize the points of the paper they are introducing in an easy-to-understand manner and explain how it relates to their research. Audiences are encouraged to understand the content of the presentation and actively ask questions.

Textbook	NA
Reference book	NA
Contact	anytime

Seminar on Crop Science (2nd year summer semester)

Registration code	61162	**Credits**	2
Instructor	NASUKAWA Hisashi	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target major**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

To link current research with previous research, we will deepen our understanding of recent crop production trends by organizing domestic and international research.

-To understand and explain terminology and experimental methods used in papers [Knowledge/Understanding]
-To organize and summarize the content of a paper [skills]
-To understand the content of the paper and comprehensively discuss the validity of the research [Attitudes/habits]

・Course Category (Relations to DP, CP and other courses)

We encourage students to actively participate in the class so that they develop skills to independently identify the challenges and present a beneficial resolution to these challenges(Curriculum Policy).

・Contents

1st Guidance
2nd-14th: Introduction to academic papers
Pick up and present an academic paper that includes the following content.
-Relationship between plant inorganic components and crop production
-Relationship between soil nutrients and crop production
-Relationship between meteorological factors and crop production
-Root system of crops
-Utilization of geographic information systems in crop production
-Crop growth evaluation and simulation model
-Crop production technology that responds to climate change
15th Final evaluation

・Evaluation

Evaluation of participants would be done based on attendance, participation, and presentations.

・Notice for Students

Presenters should use PowerPoint to summarize the points of the paper they are introducing in an easy-to-understand manner and explain how it relates to their research. Audiences are encouraged to understand the content of the presentation and actively ask questions.

Textbook	NA
Reference book	NA
Contact	anytime

Seminar on Crop Science (2nd year winter semester)

Registration code	61163	**Credits**	2
Instructor	NASUKAWA Hisashi	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target major**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

To link current research with previous research, we will deepen our understanding of recent crop production trends by organizing domestic and international research.

-To understand and explain terminology and experimental methods used in papers [Knowledge/Understanding]
-To organize and summarize the content of a paper [skills]
-To understand the content of the paper and comprehensively discuss the validity of the research [Attitudes/habits]

・Course Category (Relations to DP, CP and other courses)

We encourage students to actively participate in the class so that they develop skills to independently identify the challenges and present a beneficial resolution to these challenges(Curriculum Policy).

・Contents

1st Guidance
2nd-14th: Introduction to academic papers
Pick up and present an academic paper that includes the following content.
-Relationship between plant inorganic components and crop production
-Relationship between soil nutrients and crop production
-Relationship between meteorological factors and crop production
-Root system of crops
-Utilization of geographic information systems in crop production
-Crop growth evaluation and simulation model
-Crop production technology that responds to climate change
15th Final evaluation

・Evaluation

Evaluation of participants would be done based on attendance, participation, and presentations.

・Notice for Students

Presenters should use PowerPoint to summarize the points of the paper they are introducing in an easy-to-understand manner and explain how it relates to their research. Audiences are encouraged to understand the content of the presentation and actively ask questions.

Textbook	NA
Reference book	NA
Contact	anytime

Seminar on Edaphology
(1st year summer semester)

Registration code	61123	**Credits**	2
Instructor	KAKUDA Ken-ichi, SASAKI Yuka	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

【Purpose】
(1) To understand master thesis from a view of Edaphology
(2) To apply new information to master thesis
【Learning goals】
To explain the follows based on some references
(1) What you confirm
(2) What you get as new information

・Course Category (Relations to DP, CP and other courses)

To collect and understand the information relating to master thesis

・Contents

【Method】
(1) To select some articles relating to master thesis
(2) To make clear 1) what you confirm and 2) what you get
(3) To make stories logically with these informations
(4) To make powerpoint files with simple logic
(5) To discuss about the articles and the relation with your master thesis
【Schedule】
-Some days you have presentation and some other days other members have presentation and you are a participant for discussion
-The schedule will be decided by supervisor

・Evaluation

【Standard】
Based on the learning goals and situation of participation for presentation and discussion
【Method】
Evaluate comprehensively by the contents of presentation and situation of participation for discussion

・Notice for Students

【Advice for attendance】
(1) You have to submit the articles which you will used and the abstract of your presentation to all the participants in advance
(2) Explain simply and make the participants understand
(3) Discuss with participants actively
【Advice for outside regular school hours】
-To make simple presentation, you have to understand correctly and multidirectionally

Textbook	NA
Reference book	NA
Contact	Anytime

Seminar on Edaphology
(1st year winter semester)

Registration code	61124	**Credits**	2
Instructor	KAKUDA Ken-ichi, SASAKI Yuka	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

【Purpose】
(1) To understand master thesis from a view of Edaphology
(2) To apply new information to master thesis
【Learning goals】
To explain the follows based on some references
(1) What you confirm
(2) What you get as new information

・Course Category (Relations to DP, CP and other courses)

To collect and understand the information relating to master thesis

・Contents

【Method】
(1) To select some articles relating to master thesis
(2) To make clear 1) what you confirm and 2) what you get
(3) To make stories logically with these informations
(4) To make powerpoint files with simple logic
(5) To discuss about the articles and the relation with your master thesis
【Schedule】
-Some days you have presentation and some other days other members have presentation and you are a participant for discussion
-The schedule will be decided by supervisor

・Evaluation

【Standard】
Based on the learning goals and situation of participation for presentation and discussion
【Method】
Evaluate comprehensively by the contents of presentation and situation of participation for discussion

・Notice for Students

【Advice for attendance】
(1) You have to submit the articles which you will used and the abstract of your presentation to all the participants in advance
(2) Explain simply and make the participants understand
(3) Discuss with participants actively
【Advice for outside regular school hours】
-To make simple presentation, you have to understand correctly and multidirectionally

Textbook	NA
Reference book	NA
Contact	Anytime

Seminar on Edaphology
(2nd year summer semester)

Registration code	61719	**Credits**	2
Instructor	KAKUDA Ken-ichi, SASAKI Yuka	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

【Purpose】
(1) To understand master thesis from a view of Edaphology
(2) To apply new information to master thesis
【Learning goals】
To explain the follows based on some references
(1) What you confirm
(2) What you get as new information

・Course Category (Relations to DP, CP and other courses)

To collect and understand the information relating to master thesis

・Contents

【Method】
(1) To select some articles relating to master thesis
(2) To make clear 1) what you confirm and 2) what you get
(3) To make stories logically with these informations
(4) To make powerpoint files with simple logic
(5) To discuss about the articles and the relation with your master thesis
【Schedule】
-Some days you have presentation and some other days other members have presentation and you are a participant for discussion
-The schedule will be decided by supervisor

・Evaluation

【Standard】
Based on the learning goals and situation of participation for presentation and discussion
【Method】
Evaluate comprehensively by the contents of presentation and situation of participation for discussion

・Notice for Students

【Advice for attendance】
(1) You have to submit the articles which you will used and the abstract of your presentation to all the participants in advance
(2) Explain simply and make the participants understand
(3) Discuss with participants actively
【Advice for outside regular school hours】
-To make simple presentation, you have to understand correctly and multidirectionally

Textbook	NA
Reference book	NA
Contact	Anytime

Seminar on Edaphology
(2nd year winter semester)

Registration code	61720	**Credits**	2
Instructor	KAKUDA Ken-ichi, SASAKI Yuka	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

【Purpose】
(1) To understand master thesis from a view of Edaphology
(2) To apply new information to master thesis
【Learning goals】
To explain the follows based on some references
(1) What you confirm
(2) What you get as new information

・Course Category (Relations to DP, CP and other courses)

To collect and understand the information relating to master thesis

・Contents

【Method】
(1) To select some articles relating to master thesis
(2) To make clear 1) what you confirm and 2) what you get
(3) To make stories logically with these informations
(4) To make powerpoint files with simple logic
(5) To discuss about the articles and the relation with your master thesis
【Schedule】
-Some days you have presentation and some other days other members have presentation and you are a participant for discussion
-The schedule will be decided by supervisor

・Evaluation

【Standard】
Based on the learning goals and situation of participation for presentation and discussion
【Method】
Evaluate comprehensively by the contents of presentation and situation of participation for discussion

・Notice for Students

【Advice for attendance】
(1) You have to submit the articles which you will used and the abstract of your presentation to all the participants in advance
(2) Explain simply and make the participants understand
(3) Discuss with participants actively
【Advice for outside regular school hours】
-To make simple presentation, you have to understand correctly and multidirectionally

Textbook	NA
Reference book	NA
Contact	Anytime

Edaphology

Registration code	61137	**Credits**	1
Instructor	KAKUDA Ken-ichi	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Lecture	**Target research area**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

【Purpose】
(1) To understand site-specific nutrient management in rice cultivation
(2) To understand techniques for field experiments on paddy field
【Learning goals】
(1) To explain the procedure and background of site-specific nutrient management in rice cultivation
(2) To explain the procedure and logical background for establishment of field experiments on paddy field

・Course Category (Relations to DP, CP and other courses)

It relates to a lecture for paddy soil science and techniques for field experiments.

・Contents

Ⅰ) Lectures with some discussions about the procedure and the logical background of nutrient management in rice cultivation
1. Fundamental of nutrient management in rice cultivation
2. The nutrient input-output budget in an irrigated rice field
3. Fertilizer-use efficiency
4. Managing organic manures, straw, and green manure
5. Site-Specific Nutrient Management (SSNM)
Ⅱ) Lecture with some discussions about the basic and the application for establishment of field experiment on paddy field
1. Experimental design
2. Field technique
3. Data collection on paddy field

・Evaluation

【Standard】
The following two points are evaluated
(1) Understandings on the procedure and background of nutrient management in rice cultivation
(2) Understandings on the procedure and background of techniques for field experiments on paddy field
【Method】
Reports

・Notice for Students

Since the lectures will have discussion time, you can ask anything what you cannot understand.

Textbook	NA
Reference book	NA
Contact	Anytime

Agronomy

Registration code	61189	**Credits**	1
Instructor	SASAKI Yuka	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

【Purpose】
To understand techniques for field experiments on paddy fields.
【Learning goals】
To explain the procedure and logical background for the establishment of field experiments on paddy fields.

・Course Category (Relations to DP, CP and other courses)

It relates to a lecture on paddy soil science and techniques for field experiments.

・Contents

Lecture with some discussions about the basics and the application for establishing a field experiment on paddy fields.
1. Experimental design
2. Field technique
3. Data collection on paddy field

・Evaluation

【Standard】
The following point is evaluated:
Understanding of the procedure and background of techniques for field experiments on paddy field
【Method】
Reports

・Notice for Students

Since the lectures will have discussion time, you can ask anything you cannot understand and what you want to learn more about.

Textbook	NA
Reference book	NA
Contact	Anytime

Seminar on Animal Ecology
(1st year summer semester)

Registration code	61121	**Credits**	2
Instructor	SATO Satoru	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The aim of this course is to help students understand of the fundamentals of animal ecology.

・Course Category (Relations to DP, CP and other courses)

The aim of this course is to help students acquire an understanding of the trends in animal ecology. The goal of this course is to be able to understand the trends in animal ecology.

・Contents

In general, the seminar is held on every Friday. In each seminar, one recent scientific paper related to animal ecology is presented. Then, validity and novelty of the paper will be discussed among all participants. The detailed shedule is informed in the begining of semester.

・Evaluation

The grading is absolute evaluation based on achievement of a participant according to the aim of the course.

・Notice for Students

The seminar is facilitated by the seminar presenter. The seminar presenter should read the paper carefully and understand fully the paper contents.

Textbook	Not specified.
Reference book	Not specified.
Contact	Monday to Friday 14pm-17pm. Drop in visits and no appointment required.

Seminar on Animal Ecology
(1st year winter semester)

Registration code	61122	**Credits**	2
Instructor	SATO Satoru	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The aim of this course is to help students understand of the fundamentals of animal ecology.

・Course Category (Relations to DP, CP and other courses)

The aim of this course is to help students acquire an understanding of the trends in animal ecology. The goal of this course is to be able to understand the trends in animal ecology.

・Contents

In general, the seminar is held on every Friday. In each seminar, one recent scientific paper related to animal ecology is presented. Then, validity and novelty of the paper will be discussed among all participants. The detailed shedule is informed in the begining of semester.

・Evaluation

The grading is absolute evaluation based on achievement of a participant according to the aim of the course.

・Notice for Students

The seminar is facilitated by the seminar presenter. The seminar presenter should read the paper carefully and understand fully the paper contents.

Textbook	Not specified.
Reference book	Not specified.
Contact	Monday to Friday 14pm-17pm. Drop in visits and no appointment required.

Seminar on Animal Ecology
(2nd year summer semester)

Registration code	61717	**Credits**	2
Instructor	SATO Satoru	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The aim of this course is to help students understand of the fundamentals of animal ecology.

・Course Category (Relations to DP, CP and other courses)

The aim of this course is to help students acquire an understanding of the trends in animal ecology. The goal of this course is to be able to understand the trends in animal ecology.

・Contents

In general, the seminar is held on every Friday. In each seminar, one recent scientific paper related to animal ecology is presented. Then, validity and novelty of the paper will be discussed among all participants. The detailed shedule is informed in the begining of semester.

・Evaluation

The grading is absolute evaluation based on achievement of a participant according to the aim of the course.

・Notice for Students

The seminar is facilitated by the seminar presenter. The seminar presenter should read the paper carefully and understand fully the paper contents.

Textbook	Not specified.
Reference book	Not specified.
Contact	Monday to Friday 14pm-17pm. Drop in visits and no appointment required.

Seminar on Animal Ecology
(2nd year winter semester)

Registration code	61718	**Credits**	2
Instructor	SATO Satoru	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The aim of this course is to help students understand of the fundamentals of animal ecology.

・Course Category (Relations to DP, CP and other courses)

The aim of this course is to help students acquire an understanding of the trends in animal ecology. The goal of this course is to be able to understand the trends in animal ecology.

・Contents

In general, the seminar is held on every Friday. In each seminar, one recent scientific paper related to animal ecology is presented. Then, validity and novelty of the paper will be discussed among all participants. The detailed shedule is informed in the begining of semester.

・Evaluation

The grading is absolute evaluation based on achievement of a participant according to the aim of the course.

・Notice for Students

The seminar is facilitated by the seminar presenter. The seminar presenter should read the paper carefully and understand fully the paper contents.

Textbook	Not specified.
Reference book	Not specified.
Contact	Monday to Friday 14pm-17pm. Drop in visits and no appointment required.

Animal Ecology

Registration code	61136	**Credits**	1
Instructor	SATO Satoru	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Lecture	**Target research area**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The aim of this course is to help students understand the trends in animal ecology.

・Course Category (Relations to DP, CP and other courses)

The aim of this course is to help students acquire an understanding of the trends in animal ecology. The goal of this course is to be able to understand the trends in animal ecology.

・Contents

1st to 5th classes: Lectures on fundamentals of animal ecology.
6th to 12th classes: Lectures on current trends in animal ecology.
13th to15th classes: General discussion on animal ecology.

・Evaluation

Grading for each participant will be decided by attitude in class (50%) and final report (50%).

・Notice for Students

Participants should be activily involved in the clacsses

Textbook	Handouts will be provided in the classes.
Reference book	Not specified.
Contact	Monday to Friday 14pm-17pm. Drop in visits and no appointment required.

Advanced Pomology

Registration code	61171	**Credits**	1
Instructor	IKEDA Kazuo, SHIBUYA Tomoki	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Lecture	**Target research area**	Bioproduction Science
How to use English	Only for handouts		

・Purpose and Learning Goals

Topics of pomology, especially of the deciduous fruit tree, are reviewed.
The recent reports are also induced.
The purpose of this class is to comprehend the history of the academic research and prospectives on fruit production.

・Course Category (Relations to DP, CP and other courses)

This class is the advanced one of 'Pomology'.

・Contents

Lectures on the fpllowing topics will be delivered:

Topic 1: Flower development and dormancy of fruit trees
Topic 2: Fluit set and development of fruit trees.
Topic 3: Elucidation of astringency removal and long-storage of persimmon
Topic 4: Actuals and issues on the breeding of fruit trees
Topic 5: Mechanism of fruit coloring
Topic 6: Collection, evaluation and maintenance of local fruit cultivars
Each topic will be covered within two classes.

・Evaluation

Understanding levels of the recent topics of pomology and active participation are evaluated.
Students are asked to take tests and/or to submit reports, to understand the topics much further.

・Notice for Students

Yamagata prefecture is known as the "fruit kingdom" in Japan.
Understanding of the fruit trees cultivated in Yamagata will be good for you.
Depending on the demand, this class might be conducted as an intensive seminar.

Textbook	NA
Reference book	NA
Contact	IKEDA Kazuo:As necessary (Take an appointment by Email) SHIBUYA Tomoki:As necessary (Take an appointment by Email)

Seminar on Advanced Pomology
(1st year summer semester)

Registration code	61107	**Credits**	2
Instructor	IKEDA Kazuo, SHIBUYA Tomoki	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioproduction Science
How to use English	To interpret Japanese as main languege		

・Purpose and Learning Goals

The objective of this seminar is to systematically understand the historically important research and recent research on fruit production and utilization of deciduous fruit trees including specialty fruit trees in Yamagata Prefecture.

Objective criticism from a researcher's point of view. [Knowledge / Understanding]
Have your own opinion on future research theme. [Attitude / Habit]

・Course Category (Relations to DP, CP and other courses)

You will be able to explain the specialized knowledge in the field of Pomology (Diploma Policy).
You can also use it as a training subject to develop the ability to express the results obtained by exploring yourself, such as presentations at academic conferences (Curriculum policy) .

・Contents

Regarding on the themes shown in the following lecture plans, the lectures will be conducted in a discussion format with reference to actual academic papers.
1.Flowering and fruiting physiology
2.Fruit growth and maturity
3.Fruit quality and post-harvest handling
4.Breeding of fruit trees

・Evaluation

Understanding of the presentation theme, recognition of problems, active opinion formation and presence / absence of dicussion are required.
Comprehensively evaluate the positiveness and quality of the presentation about research and the appropriateness of the content.

・Notice for Students

Focus on preparation rather than review. However, also try to solve unclarified issue positively.
Presenters must prepare for presentations, and listeners must prepare questions.

Textbook	NA
Reference book	NA
Contact	IKEDA Kazuo:As necessary (Take an appointment by Email) SHIBUYA Tomoki:As necessary (Take an appointment by Email)

Seminar on Advanced Pomology
(1st year winter semester)

Registration code	61108	**Credits**	2
Instructor	IKEDA Kazuo, SHIBUYA Tomoki	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioproduction Science
How to use English	To interpret Japanese as main languege		

・Purpose and Learning Goals

The objective of this seminar is to systematically understand the historically important research and recent research on fruit production and utilization of deciduous fruit trees including specialty fruit trees in Yamagata Prefecture..

Objective criticism from a researcher's point of view. [Knowledge / Understanding]
Have your own opinion on future research theme. [Attitude / Habit]

・Course Category (Relations to DP, CP and other courses)

You will be able to explain the specialized knowledge in the field of Pomology (Diploma Policy).
You can also use it as a training subject to develop the ability to express the results obtained by exploring yourself, such as presentations at academic conferences (Curriculum policy) .

・Contents

Regarding on the themes shown in the following lecture plans, the lectures will be conducted in a discussion format with reference to actual academic papers.
1.Flowering and fruiting physiology
2.Fruit growth and maturity
3.Fruit quality and post-harvest handling
4.Breeding of fruit trees

・Evaluation

Understanding of the presentation theme, recognition of problems, active opinion formation and presence / absence of dicussion are required.
Comprehensively evaluate the positiveness and quality of the presentation about research and the appropriateness of the content.

・Notice for Students

Focus on preparation rather than review. However, also try to solve unclarified issue positively.
Presenters must prepare for presentations, and listeners must prepare questions.

Textbook	NA
Reference book	NA
Contact	IKEDA Kazuo:As necessary (Take an appointment by Email) SHIBUYA Tomoki:As necessary (Take an appointment by Email)

Seminar on Advanced Pomology
(2nd year summer semester)

Registration code	61125	**Credits**	2
Instructor	IKEDA Kazuo, SHIBUYA Tomoki	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioproduction Science
How to use English	To interpret Japanese as main languege		

・Purpose and Learning Goals

The objective of this seminar is to systematically understand the historically important research and recent research on fruit production and utilization of deciduous fruit trees including specialty fruit trees in Yamagata Prefecture..

Objective criticism from a researcher's point of view. [Knowledge / Understanding]
Have your own opinion on future research theme. [Attitude / Habit]

・Course Category (Relations to DP, CP and other courses)

You will be able to explain the specialized knowledge in the field of Pomology (Diploma Policy).
You can also use it as a training subject to develop the ability to express the results obtained by exploring yourself, such as presentations at academic conferences (Curriculum policy) .

・Contents

Regarding on the themes shown in the following lecture plans, the lectures will be conducted in a discussion format with reference to actual academic papers.
1.Flowering and fruiting physiology
2.Fruit growth and maturity
3.Fruit quality and post-harvest handling
4.Breeding of fruit trees

・Evaluation

Understanding of the presentation theme, recognition of problems, active opinion formation and presence / absence of dicussion are required.
Comprehensively evaluate the positiveness and quality of the presentation about research and the appropriateness of the content.

・Notice for Students

Focus on preparation rather than review. However, also try to solve unclarified issue positively.
Presenters must prepare for presentations, and listeners must prepare questions.

Textbook	NA
Reference book	NA
Contact	IKEDA Kazuo:As necessary (Take an appointment by Email) SHIBUYA Tomoki:As necessary (Take an appointment by Email)

Seminar on Advanced Pomology
(2nd year winter semester)

Registration code	61126	**Credits**	2
Instructor	IKEDA Kazuo, SHIBUYA Tomoki	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioproduction Science
How to use English	To interpret Japanese as main languege		

・Purpose and Learning Goals

The objective of this seminar is to systematically understand the historically important research and recent research on fruit production and utilization of deciduous fruit trees including specialty fruit trees in Yamagata Prefecture..

Objective criticism from a researcher's point of view. [Knowledge / Understanding]
Have your own opinion on future research theme. [Attitude / Habit]

・Course Category (Relations to DP, CP and other courses)

You will be able to explain the specialized knowledge in the field of Pomology (Diploma Policy).
You can also use it as a training subject to develop the ability to express the results obtained by exploring yourself, such as presentations at academic conferences (Curriculum policy) .

・Contents

Regarding on the themes shown in the following lecture plans, the lectures will be conducted in a discussion format with reference to actual academic papers.
1.Flowering and fruiting physiology
2.Fruit growth and maturity
3.Fruit quality and post-harvest handling
4.Breeding of fruit trees

・Evaluation

Understanding of the presentation theme, recognition of problems, active opinion formation and presence / absence of dicussion are required.
Comprehensively evaluate the positiveness and quality of the presentation about research and the appropriateness of the content.

・Notice for Students

Focus on preparation rather than review. However, also try to solve unclarified issue positively.
Presenters must prepare for presentations, and listeners must prepare questions.

Textbook	NA
Reference book	NA
Contact	IKEDA Kazuo:As necessary (Take an appointment by Email) SHIBUYA Tomoki:As necessary (Take an appointment by Email)

Seminar on Plant Pathology
(1st year summer semester)

Registration code	61119	**Credits**	2
Instructor	HASE Shu, KOBAYASHI Takashi	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The purpose of this course is to collect domestic and international research papers related to plant pathology and to present their outlines. Furthermore, the course aims at overviewing the whole picture of researches and trends in the field. The goal is to strengthen students' background of master's thesis research.

・Course Category (Relations to DP, CP and other courses)

This seminar aims to learn the ability to search and analyze the background researches related to the master thesis research themes (curriculum policy of Graduate School of Agricultural science in YU, Other courses: Seminar on Plant Pathology, Special seminar on bio production).

・Contents

Students are required to search for academic papers related to their master's thesis researches, comprehend the paper contents, and explain the outlines. After that, all paticipants will have a discussion about the paper contents.

・Evaluation

Students need to prepare the presentation sufficiently and design contents to be easily understood. Students should fully respond to questions and general discussions.

・Notice for Students

Students are expected to provide active and aggressive discussions and questions during this seminar. Students should attend the traning course of web of science.

Textbook	International academic journals and reviews (Annual review of Phytopathology、Phytopathology, Plant Disease, MPMI, Journal of General Plant Pathology etc.)
Reference book	NA
Contact	After 16:00

Seminar on Plant Pathology
(1st year winter semester)

Registration code	61714	**Credits**	2
Instructor	HASE Shu, KOBAYASHI Takashi	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The purpose of this course is to collect domestic and international research papers related to plant pathology and to present their outlines. Furthermore, the course aims at overviewing the whole picture of researches and trends in the field. The goal is to strengthen students' background of master's thesis research.

・Course Category (Relations to DP, CP and other courses)

This seminar aims to learn the ability to search and analyze the background researches related to the master thesis research themes (curriculum policy of Graduate School of Agricultural science in YU, Other courses: Seminar on Plant Pathology, Special seminar on bio production).

・Contents

Students are required to search for academic papers related to their master's thesis researches, comprehend the paper contents, and explain the outlines. After that, all paticipants will have a discussion about the paper contents.

・Evaluation

Students need to prepare the presentation sufficiently and design contents to be easily understood. Students should fully respond to questions and general discussions.

・Notice for Students

Students are expected to provide active and aggressive discussions and questions during this seminar. Students should attend the traning course of web of science.

Textbook	International academic journals and reviews (Annual review of Phytopathology、Phytopathology, Plant Disease, MPMI, Journal of General Plant Pathology etc.)
Reference book	NA
Contact	After 16:00

Seminar on Plant Pathology
(2nd year summer semester)

Registration code	61715	**Credits**	2
Instructor	HASE Shu, KOBAYASHI Takashi	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The purpose of this course is to collect domestic and international research papers related to plant pathology and to present their outlines. Furthermore, the course aims at overviewing the whole picture of researches and trends in the field. The goal is to strengthen students' background of master's thesis research.

・Course Category (Relations to DP, CP and other courses)

This seminar aims to learn the ability to search and analyze the background researches related to the master thesis research themes (curriculum policy of Graduate School of Agricultural science in YU, Other courses: Seminar on Plant Pathology, Special seminar on bio production).

・Contents

Students are required to search for academic papers related to their master's thesis researches, comprehend the paper contents, and explain the outlines. After that, all paticipants will have a discussion about the paper contents.

・Evaluation

Students need to prepare the presentation sufficiently and design contents to be easily understood. Students should fully respond to questions and general discussions.

・Notice for Students

Students are expected to provide active and aggressive discussions and questions during this seminar. Students should attend the traning course of web of science.

Textbook	International academic journals and reviews (Annual review of Phytopathology、 Phytopathology, Plant Disease, MPMI, Journal of General Plant Pathology etc.)
Reference book	NA
Contact	After 16:00

Seminar on Plant Pathology
(2nd year winter semester)

Registration code	61716	**Credits**	2
Instructor	HASE Shu, KOBAYASHI Takashi	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The purpose of this course is to collect domestic and international research papers related to plant pathology and to present their outlines. Furthermore, the course aims at overviewing the whole picture of researches and trends in the field. The goal is to strengthen students' background of master's thesis research.

・Course Category (Relations to DP, CP and other courses)

This seminar aims to learn the ability to search and analyze the background researches related to the master thesis research themes (curriculum policy of Graduate School of Agricultural science in YU, Other courses: Seminar on Plant Pathology, Special seminar on bio production).

・Contents

Students are required to search for academic papers related to their master's thesis researches, comprehend the paper contents, and explain the outlines. After that, all paticipants will have a discussion about the paper contents.

・Evaluation

Students need to prepare the presentation sufficiently and design contents to be easily understood. Students should fully respond to questions and general discussions.

・Notice for Students

Students are expected to provide active and aggressive discussions and questions during this seminar. Students should attend the traning course of web of science.

Textbook	International academic journals and reviews (Annual review of Phytopathology、Phytopathology, Plant Disease, MPMI, Journal of General Plant Pathology etc.)
Reference book	NA
Contact	After 16:00

Advanced Plant Pathology

Registration code	61135	**Credits**	1
Instructor	HASE Shu, KOBAYASHI Takashi	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Lecture	**Target research area**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The purpose of this course is to gain a better understanding of basic and applied researches leading to technology for controlling crop diseases. The goal of this course is to be able to describe major mechanisms of plant -pathogen interaction and technical skills of disease controls.

・Course Category (Relations to DP, CP and other courses)

We introduce case studies of major rice diseases and disease controls such as chemical control, biological control and forecasting of rice diseases. We also explain the law concerning plant protection such as plant protection act and agricultural chemical regulation. In addition, we introduce plant infection physiology, basic molecular biology research, and related recent topics on plant pathogen interaction. Key words: rice diseases, disease control, biological control, induced resistance, crop immunity.
This course aims to acquire a broader range of advanced knowledge such as advanced research reports on plant pathology (curriculum policy of Graduate School of Agricultural science in YU, Other courses: Seminar on Plant Pathology, Special lecture on bio production).

・Contents

Lectures delivered by KOBAYASHI Takashi
1: Rice Blast Disease and Other rice diseases
2:Forecasting of rice diseases and Pest magegement
3: Plant protection act and Agricultural Chemicals Control Law
4: Topics 1
Lectures delivered by HASE Shu
5: Plant microbe interaction
6: Biological control
7: Induced resistance by beneficial microbes
8: Topics 2

・Evaluation

We make the following criteria for evaluation. Students can understand the basic researches related to crop disease control technology and the outline of applied researches, and accurately respond to questions, quizzes and so on.We evaluate answers to the questions and quizzes in the lectures or short reports.

・Notice for Students

We welcome to have your questions during this course.
Students should review the lectures as soon as possible.

Textbook	NA
Reference book	Plant Pathology 5th ed (Agrios 2005)
Contact	After 16:00

Enviroment Geography

Registration code	61210	**Credits**	1
Instructor	WATANABE Rie	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

This course deals with the basis of Enviroment Geography, with the history of changes of the natural environment and the landscape.
The goals of this course are :
(1) To obtain basic knowledge about Enviroment Geography.
(2) To understand the relationship between human agency and the changes of natural environment from the viewpoint of the local history.

・Course Category (Relations to DP, CP and other courses)

The goal of this course is to get the comprehension related to the human agency (agriculture) and natural environment that have global perspectives.

・Contents

1. Introduction: What is Enviroment Geography?
2. History of the theme of Enviroment Geography
3. Principles of Rural Area Landscape
4. Thinking: how to maintain landscape(1)
5. Thinking: how to maintain landscape(2)
6. Try to read research papers (1)
7. Try to read research papers (2)
8. Relationship between human agency and natural environment (1)
9. Relationship between human agency and natural environment (2)
10. Try to read research papers (3)
11. Try to read research papers (4)
12. Discussion
13. Review
14. Review
15. Final Exam

・Evaluation

Your overall grade in the class will be decided as follows:
- Class attendance and attitude in class: 20%
- Short reports: 30%
- Term-end examination: 50%

・Notice for Students

Textbook	Will be introduced in the class
Reference book	Diamond, Jared M. 1999 Guns, germs, and steel : the fates of human societies / W.W. Norton(Guns, germs, and steel : the fates of human societies / Jared Diamond (New York) Stephen Daniels 1994 Fields of vision : landscape imagery and national identity in England and the United States,Polity Press(Cambridge)
Contact	Anytime is OK (on weekday am:9:00-pm5:00)

Vegetable Science

Registration code	61188	**Credits**	1
Instructor	NABESHIMA Tomoyuki	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioproduction Science
How to use English	Mainly Japanese		

・Purpose and Learning Goals

This course deals with the important subjects for making M.Sc. thesis such as cell biology, physiological functions of plant, plant biochemistry, physiological disorders, plant hormones, and postharvest physiology. At the end of the course, participants are expected to understand the physiological mechanism of plants.

・Course Category (Relations to DP, CP and other courses)

This course enhances the development of students' skills in making MS thesis (CP of Bioproduction Science).

・Contents

1. Vegetables in Japan
2. Function of plant cells
3. Function of leaf
4. Function of root
5. Function of stem
6. Function of flower
7. Function of fruit
8. Postharvest physiology
9. Physiological disorder
10. Fertilization and development
11. Plant growth
12. Mechanism of senescence
13. Plant hormones and their utilization
14. Plant factory
15. Indigenous crops in Japan

・Evaluation

Your overall grade in the class will be decided as follows:
1. Class attendance and attitude in class: 20%
2. Presentation: 80%

・Notice for Students

This course will be taught in English and Japanese.

Textbook	NA
Reference book	T. Higashide (2013). Tomatoes : cultivation, varieties and nutrition. Nova Publishers
Contact	Mon. 9:00-10-00 (a.m.)

Seminar on Vegetable Science
(1st year summer semester)

Registration code	61142	**Credits**	2
Instructor	NABESHIMA Tomoyuki	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioproduction Science
How to use English	Mainly Japanese		

・Purpose and Learning Goals

Understand the contents of newly published articles in the field of vegetable physiology.

・Course Category (Relations to DP, CP and other courses)

This course deals with the concepts and principles of vegatable physiology. It also enhances the development of students' skills in making oral presentation and self-regulated learning (CP of Bioproduction Science).

・Contents

Choose appropliate articles in the following fields, and introduce the contents:
1. Photosynthesis, respiration and metabolism of photosynthates
2. Cell walls
3. Regulation of plant growth
4. Storage of fruit vegetables
5. Plant factory
6. Physiological disorders
7. Plant nutrition
8. Metabolism of secondary products

・Evaluation

Your overall grade in the class will be decided as follows:
1. Class attendance and attitude in class: 20%
2. Presentation: 80%

・Notice for Students

This course will be taught in English.

Textbook	NA
Reference book	NA
Contact	Mon. 9:00-10-00 (a.m.)

Seminar on Vegetable Science
(1st year winter semester)

Registration code	61143	**Credits**	2
Instructor	NABESHIMA Tomoyuki	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioproduction Science
How to use English	Mainly Japanese		

・Purpose and Learning Goals

Understand the contents of newly published articles in the field of vegetable physiology.

・Course Category (Relations to DP, CP and other courses)

This course deals with the concepts and principles of vegatable physiology. It also enhances the development of students' skills in making oral presentation and self-regulated learning (CP of Bioproduction Science).

・Contents

Choose appropliate articles in the following fields, and introduce the contents:
1. Photosynthesis, respiration and metabolism of photosynthates
2. Cell walls
3. Regulation of plant growth
4. Storage of fruit vegetables
5. Plant factory
6. Physiological disorders
7. Plant nutrition
8. Metabolism of secondary products

・Evaluation

Your overall grade in the class will be decided as follows:
1. Class attendance and attitude in class: 20%
2. Presentation: 80%

・Notice for Students

This course will be taught in English.

Textbook	NA
Reference book	NA
Contact	Mon. 9:00-10-00 (a.m.)

Seminar on Vegetable Science
(2nd year summer semester)

Registration code	61152	**Credits**	2
Instructor	NABESHIMA Tomoyuki	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioproduction Science
How to use English	Mainly Japanese		

・Purpose and Learning Goals

Understand the contents of newly published articles in the field of vegetable physiology.

・Course Category (Relations to DP, CP and other courses)

This course deals with the concepts and principles of vegatable physiology. It also enhances the development of students' skills in making oral presentation and self-regulated learning (CP of Bioproduction Science).

・Contents

Choose appropliate articles in the following fields, and introduce the contents:
1. Photosynthesis, respiration and metabolism of photosynthates
2. Cell walls
3. Regulation of plant growth
4. Storage of fruit vegetables
5. Plant factory
6. Physiological disorders
7. Plant nutrition
8. Metabolism of secondary products

・Evaluation

Your overall grade in the class will be decided as follows:
1. Class attendance and attitude in class: 20%
2. Presentation: 80%

・Notice for Students

This course will be taught in English.

Textbook	NA
Reference book	NA
Contact	Mon. 9:00-10-00 (a.m.)

Seminar on Vegetable Science
(2nd year winter semester)

Registration code	61153	**Credits**	2
Instructor	NABESHIMA Tomoyuki	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioproduction Science
How to use English	Mainly Japanese		

・Purpose and Learning Goals

Understand the contents of newly published articles in the field of vegetable physiology.

・Course Category (Relations to DP, CP and other courses)

This course deals with the concepts and principles of vegatable physiology. It also enhances the development of students' skills in making oral presentation and self-regulated learning (CP of Bioproduction Science).

・Contents

Choose appropliate articles in the following fields, and introduce the contents:
1. Photosynthesis, respiration and metabolism of photosynthates
2. Cell walls
3. Regulation of plant growth
4. Storage of fruit vegetables
5. Plant factory
6. Physiological disorders
7. Plant nutrition
8. Metabolism of secondary products

・Evaluation

Your overall grade in the class will be decided as follows:
1. Class attendance and attitude in class: 20%
2. Presentation: 80%

・Notice for Students

This course will be taught in English.

Textbook	NA
Reference book	NA
Contact	Mon. 9:00-10-00 (a.m.)

Seminar on Sociology of Food, Agriculture, and Environment
(1st year summer semester)

Registration code	61150	**Credits**	2
Instructor	HOKIMOTO Toshiyuki	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The purpose of this seminar is to help students review the past publications related to their studies. The goal of this seminar is to be able to discuss about the outcome from the students' studies based on the research trends in the related fields.

・Course Category (Relations to DP, CP and other courses)

This course is to obtain "the capacity to perform planning of survey and experiment, implementation, data analysis and discussion for solution of problems" in the diploma policy of Deparment of Bioenvironmental Science.

・Contents

Participants read research articles and review papers on agricultural probrems or data collection for the analysis. One or few students in each class make the presentations on the articles/papers for discussion with the other participants. The participants should attend all of 15 classess as speakers or audiences.

・Evaluation

Grading will be decided based on your presentation (60%) and attitude in discussion (40%).

・Notice for Students

Your active participation in discussion is expected.

Textbook	Handouts will be provided in the classes.
Reference book	NA
Contact	My office is on the 3rd floor of the 1st building. You can contact me anytime via email (hokimoto@tds1.tr.yamagata-u.ac.jp).

Seminar on Sociology of Food, Agriculture, and Environment
(1st year winter semester)

Registration code	61151	**Credits**	2
Instructor	HOKIMOTO Toshiyuki	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The purpose of this seminar is to help students review the past publications related to their studies. The goal of this seminar is to be able to discuss about the outcome from the students' studies based on the research trends in the related fields.

・Course Category (Relations to DP, CP and other courses)

This course is to obtain "the capacity to perform planning of survey and experiment, implementation, data analysis and discussion for solution of problems" in the diploma policy of Deparment of Bioenvironmental Science.

・Contents

Participants read research articles and review papers on agricultural probrems or data collection for the analysis. One or few students in each class make the presentations on the articles/papers for discussion with the other participants. The participants should attend all of 15 classess as speakers or audiences.

・Evaluation

Grading will be decided based on your presentation (60%) and attitude in discussion (40%).

・Notice for Students

Your active participation in discussion is expected.

Textbook	Handouts will be provided in the classes.
Reference book	NA
Contact	My office is on the 3rd floor of the 1st building. You can contact me anytime via email (hokimoto@tds1.tr.yamagata-u.ac.jp).

Seminar on Sociology of Food, Agriculture, and Environment
(2nd year summer semester)

Registration code	61727	**Credits**	2
Instructor	HOKIMOTO Toshiyuki	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The purpose of this seminar is to help students review the past publications related to their studies. The goal of this seminar is to be able to discuss about the outcome from the students' studies based on the research trends in the related fields.

・Course Category (Relations to DP, CP and other courses)

This course is to obtain "the capacity to perform planning of survey and experiment, implementation, data analysis and discussion for solution of problems" in the diploma policy of Deparment of Bioenvironmental Science.

・Contents

Participants read research articles and review papers on agricultural probrems or data collection for the analysis. One or few students in each class make the presentations on the articles/papers for discussion with the other participants. The participants should attend all of 15 classess as speakers or audiences.

・Evaluation

Grading will be decided based on your presentation (60%) and attitude in discussion (40%).

・Notice for Students

Your active participation in discussion is expected.

Textbook	Handouts will be provided in the classes.
Reference book	NA
Contact	My office is on the 3rd floor of the 1st building. You can contact me anytime via email (hokimoto@tds1.tr.yamagata-u.ac.jp).

Seminar on Sociology of Food, Agriculture, and Environment
(2nd year winter semester)

Registration code	61728	**Credits**	2
Instructor	HOKIMOTO Toshiyuki	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The purpose of this seminar is to help students review the past publications related to their studies. The goal of this seminar is to be able to discuss about the outcome from the students' studies based on the research trends in the related fields.

・Course Category (Relations to DP, CP and other courses)

This course is to obtain "the capacity to perform planning of survey and experiment, implementation, data analysis and discussion for solution of problems" in the diploma policy of Deparment of Bioenvironmental Science.

・Contents

Participants read research articles and review papers on agricultural probrems or data collection for the analysis. One or few students in each class make the presentations on the articles/papers for discussion with the other participants. The participants should attend all of 15 classess as speakers or audiences.

・Evaluation

Grading will be decided based on your presentation (60%) and attitude in discussion (40%).

・Notice for Students

Your active participation in discussion is expected.

Textbook	Handouts will be provided in the classes.
Reference book	NA
Contact	My office is on the 3rd floor of the 1st building. You can contact me anytime via email (hokimoto@tds1.tr.yamagata-u.ac.jp).

Sociology of Food, Agriculture, and Environment

Registration code	61161	**Credits**	1
Instructor	HOKIMOTO Toshiyuki	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Lecture	**Target research area**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

This course introduces how to think about agricultural problems based on historical sociology, political economy and pesant study viewpoints. The goal of this course is to be able to understand basic concepts of and analytical methods for agricultural problems.

・Course Category (Relations to DP, CP and other courses)

This course is to obtain "the capacity to perform planning of survey and experiment, implementation, data analysis and discussion for solution of problems" in the diploma policy of Deparment of Bioenvironmental Science.

・Contents

1st to 4th classes: Lectures on concept of agricultural problems.
5th to 8th classes: Lectures on analytical method for agricultural problems.
9th to 13th classes: Lectures on application of agricultural problem analysis.
14th & 15th classes: Discussion on agricultural problems.

・Evaluation

Grading will be decided based on class attendance and attitude in class (20%) and final report (80%).

・Notice for Students

Your active participation in discussion is expected.

Textbook	Handouts will be provided in the classes.
Reference book	NA
Contact	My office is on the 3rd floor of the 1st building. You can contact me anytime via email (hokimoto@tds1.tr.yamagata-u.ac.jp).

Seminar on Bioresources Chemistry
(1st year summer semester)

Registration code	61313	**Credits**	2
Instructor	SHIONO Yoshihito	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioresource Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

１）The purpose is to learn about the cultivation methods of physiologically active substances produced by microorganisms.
２）The aim is to acquire knowledge about enzymes and other substances produced by microorganisms.

・Course Category (Relations to DP, CP and other courses)

This course is designed to provide a broader range of specialized knowledge and problem-solving skills related to biological resources, enabling students to address various issues in both local and international communities. It aims to equip students with practical skills necessary for engaging in research and development activities.

・Contents

In this course, we will use the following paper as a textbook, covering the following topics:

Recent advances in microorganisms producing physiologically active substances
Sources for isolating microorganisms producing physiologically active substances
Methods for isolating microorganisms
Cultivation methods for microorganisms
Liquid culture media for microorganisms
Solid culture media for microorganisms
Cultivation conditions and environments for microorganisms
Physiologically active substances produced by microorganisms
Challenges in culturing difficult microorganisms
Enzymes produced by microorganisms

・Evaluation

Criteria:
Understanding the fundamental aspects of responses during participation in exercises, questioning and answering sessions, as well as the attainment goals of the class, including the sources for microbial isolation, cultivation conditions, and enzymes produced by microorganisms, will be the criteria for passing.

・Notice for Students

Beforehand understanding of organic chemistry is necessary

Textbook	Not text prepared.
Reference book	NA
Contact	yshiono@tds1.tr.yamagata-u.ac.jp

Seminar on Bioresources Chemistry
(1st year winter semester)

Registration code	61314	**Credits**	2
Instructor	SHIONO Yoshihito	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioresource Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

1)The objective is to learn about the bioactive substances produced by basidiomycetes and ascomycetes.
2) The goal is to acquire knowledge about microbial cultivation methods and methods for enzyme purification.

・Course Category (Relations to DP, CP and other courses)

This course aims to provide students with an understanding of naturally occurring organic compounds produced by microorganisms, particularly basidiomycetes and ascomycetes, as biological resources. It focuses on acquiring specialized knowledge in the field of natural organic chemistry, developing skills in problem exploration, practical abilities essential for engaging in research and development activities, and gaining knowledge in purification methods and characterization of enzymes produced by food microorganisms.

・Contents

Bioactive Compounds Produced by Filamentous Fungi
Isolation Sources of Filamentous Fungi Producing Bioactive Compounds
Microbial Cultivation Methods
Bioactive Compounds Produced by Basidiomycetes and Ascomycetes
Medium Composition and Cultivation Environment in Natural Product Discovery
Microbial Contribution to Natural Product Exploration
Enzymes Produced by Microorganisms

・Evaluation

Evaluation will be based on participation in class (20 points), presentation (40 points), and Q&A sessions (40 points). Participation will consider the frequency and quality of questions asked. Presentation and Q&A sessions will assess the organization of presentation content, comprehension of fundamental topics from provided materials, and responsiveness during Q&A interactions.

・Notice for Students

Beforehand understanding of organic chemistry is necessary

Textbook	Not text prepared.
Reference book	NA
Contact	yshiono@tds1.tr.yamagata-u.ac.jp

Seminar on Bioresources Chemistry
(2nd year summer semester)

Registration code	61377	**Credits**	2
Instructor	SHIONO Yoshihito	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioresource Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

1) The objective is to learn about the isolation and purification methods of bioactive substances produced by filamentous fungi.
2) The objective is to learn about the analysis and identification methods of bioactive substances, which are secondary metabolites produced by filamentous fungi.
3)The objective is to learn about the characteristics of enzymes produced by microorganisms.

・Course Category (Relations to DP, CP and other courses)

This course aims to provide an understanding of naturally occurring organic compounds produced by microorganisms as biological resources. It is designed to impart specialized knowledge in the field of natural organic chemistry, develop skills in problem exploration, practical abilities essential for engaging in research and development activities, and impart knowledge about enzymes produced by microorganisms.

・Contents

About microorganisms producing bioactive substances
Purification of bioactive substances from microorganisms
Efficient purification methods for bioactive substances
Basic purification of bioactive substances using HPLC
Identification of bioactive substances using LC/MS
Purification of bioactive substances using flash column chromatography
Efficient extraction methods
Identification of bioactive substances using GC/MS
Colorimetric tests on TLC
Applications of column chromatography in the purification of bioactive substances
Ion exchange chromatography in the purification of bioactive substances

・Evaluation

Attendance (20 points), Presentation (40 points), and Q&A (40 points) will be evaluated. Attendance will be assessed based on the frequency and quality of questions asked. Presentation and Q&A will be evaluated based on the organization of presentation content, understanding of fundamental topics from provided materials, and responsiveness during Q&A interactions.

・Notice for Students

Beforehand understanding of organic chemistry is necessary

Textbook	Not text prepared.
Reference book	NA
Contact	yshiono@tds1.tr.yamagata-u.ac.jp

Seminar on Bioresources Chemistry
(2nd year winter semester)

Registration code	61378	**Credits**	2
Instructor	SHIONO Yoshihito	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioresource Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

1) The objective is to learn about the chemical structure analysis of small bioactive molecules produced by filamentous fungi.
2) The objective is to learn about the characteristics of enzymes produced by microorganisms.

・Course Category (Relations to DP, CP and other courses)

This course aims to provide a comprehensive understanding of naturally occurring organic compounds produced by microorganisms as biological resources. It is designed to impart specialized knowledge in the field of natural organic chemistry, develop skills in problem exploration, practical abilities essential for engaging in research and development activities, and impart knowledge about hydrolytic enzymes produced by microorganisms.

・Contents

Handling methods for bioactive compounds as organic compounds
Pre-treatment methods for measurement using various spectrophotometers
General chemical structure analysis of bioactive compounds
Molecular spectroscopic analysis of bioactive compounds
Ultraviolet spectroscopy (principles and data analysis methods)
Near-infrared spectroscopy (principles and data analysis methods)
Nuclear magnetic resonance spectroscopy
Analysis methods for nuclear magnetic resonance spectra
Analysis methods for mass spectra
Characteristics of enzymes produced by microorganisms

・Evaluation

Attendance (20 points), Presentation (40 points), and Q&A (40 points) will be evaluated. Attendance will be assessed based on the frequency and quality of questions asked. Presentation and Q&A will be evaluated based on the organization of presentation content, understanding of fundamental topics from provided materials, and responsiveness during Q&A interactions.

・Notice for Students

Beforehand understanding of organic chemistry is necessary

Textbook	Not text prepared.
Reference book	NA
Contact	yshiono@tds1.tr.yamagata-u.ac.jp

Bioresources Chemistry

Registration code	61328	**Credits**	1
Instructor	SHIONO Yoshihito	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioresource Science
How to use English	Mostly in English		

・Purpose and Learning Goals

1)The purpose is to learn about the activity of novel substances, their structures, methods for chemical structure analysis, and biosynthetic pathways using literature on natural physiologically active substances.
2) The objective is to understand the chemical structural novelty of natural physiologically active substances and their potential application areas.

・Course Category (Relations to DP, CP and other courses)

This course aims to acquire specialized knowledge in biological organic chemistry through the use of natural biological resources as subjects. Additionally, it is designed to develop advanced expertise towards resolving issues in local and international communities. (Curriculum Policy of the Graduate School of Agricultural Science)

・Contents

In this course, you will have the opportunity to use and present materials covering the following topics:
Classification of natural organic compounds
Separation and purification of natural organic compounds
Physiologically active substances present in plants
Physiologically active substances produced by microorganisms
Chemical structure analysis of natural organic compounds
Physiological activity of natural organic compounds
Student presentations on assigned topics 1
Student presentations on assigned topics 2

・Evaluation

Evaluation will be based on presentations and report submissions, assessing how well fundamental topics and relevant issues are summarized. Participation in the class is worth 10 points, presentations are worth 45 points, and reports are worth 45 points.

・Notice for Students

Beforehand understanding of organic chemistry is necessary.

Textbook	Textbooks will not be used but handouts will be distributed.
Reference book	NA
Contact	yshiono@tds1.tr.yamagata-u.ac.jp

Functional Food Science

Registration code	61421	**Credits**	1
Instructor	KANOH Naomi	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Lecture	**Target major**	Bioresource Science
How to use English	Handsout only		

・Purpose and Learning Goals

[Purpose]
To acquire advanced specialized knowledge in functional food science.

[Learning goals]
To understand and explain the functionality of food related to human health maintenance and enhancement, as well as the experimental methods to scientifically demonstrate it.

・Course Category (Relations to DP, CP and other courses)

This course aims to acquire basic knowledge, learn the latest insights, and gain advanced specialized knowledge on functional food science (DP and CP).

・Contents

[Teaching Methods]
This course primarily consists of face-to-face lectures, but remote teaching methods (such as web classes and Zoom) will also be utilized. Lectures will cover examples of research on functional mechanisms of food components related to human health maintenance and disease prevention. Students will be assigned research tasks.
Students will research the assigned topics, create materials, and deliver oral presentations. Additionally, students will deepen their understanding through discussions among students about the presentation content, with the supplementary explanations by teaching staff as needed.

[Schedule]
1. Orientation (Overview Explanation, Assignment Setting)
2. Examples of Food Functional Science Research (1)
3. Examples of Food Functional Science Research (2)
4. Examples of Food Functional Science Research (3)
5. Student Assignment Presentations 1
6. Student Assignment Presentations 2
7. Student Assignment Presentations 3
8. Summary

・Evaluation

[Criteria]
Evaluation will be based on whether students correctly understand and can explain advanced specialized matters related to functional food science through the assignment presentations, along with an overall assessment of the attitude toward participation in class, with a passing grade set at 60 points out of 100.

[Methods]
Assignment presentations: 60 points
Attitude toward participation in class (participation points, questions and answers, participation in discussions, etc.): 40 points

・Notice for Students

[Approach to Learning]
Students should strive to understand the lecture content and other student's presentations, think scientifically and critically, and express questions and opinions. Also, Students should make efforts to understand the content by consulting reference books and related literature if there are areas of difficulty.

[Advice for Study Outside of Class (Preparation/Review)]
Students should acquire basic knowledge from textbooks and other materials related to functional food science. Also, students should confirm the understanding of lecture content and strive to understand unclear points by researching on your own as much as possible.

Textbook	NA
Reference book	NA
Contact	Mondays, 4:00 PM - 5:00 PM. Please contact in advance via email or other means.

Seminar on Functional Food Science (1st year summer semester)			
Registration code	61416	**Credits**	2
Instructor	KANOH Naomi	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target major**	Bioresource Science
How to use English	Handsout only		

・Purpose and Learning Goals

[Purpose]
To acquire advanced specialized knowledge and experimental techniques in functional food science, English paper reading comprehension, and presentation skills.

[Learning goals]
・To understand and explain specialized topics and experimental techniques in functional food science.
・To read English papers accurately and explain their contents clearly to others through presentations.

・Course Category (Relations to DP, CP and other courses)

This course aims to aquire advanced knowledge, experimental techniques, and problem-solving abilities related to functional food science to address diverse issues in local and international communities (DP and CP).

・Contents

[Teaching Methods]
Primarily face-to-face seminar, supplemented by remote teaching methods (web classes, Zoom).
Students will take turns presenting PowerPoint materials prepared in advance.

[Schedule]
Sessions 1-15:
Students will individually read the latest English papers on functional food science, summarize them in PowerPoint presentations, and answer questions from fellow students and the teaching staff.

・Evaluation

[Criteria]
Evaluation will be based on the understanding of advanced specialized knowledge and experimental techniques in functional food science through reading and presenting English papers, as well as through question and answer sessions and discussions, with a passing grade set at 60 points out of 100.

[Methods]
Presentation: 60 points
Attitude toward participation in class (participation points, questions and answers, participation in discussions, etc.): 40 points

・Notice for Students

[Approach to Learning]
Presenters should thoroughly research any unclear points in English papers on functional food science, create PowerPoint materials that accurately convey the content to others, and prepare to answer questions from the audience. Audience members should actively listen, strive to understand the content, think critically, and ideally ask questions or share opinions at least once per session.

[Advice for Study Outside of Class (Preparation/Review)]
Students should acquire foundational knowledge from textbooks and other materials related to functional food science. Also, students should research unclear points using reference books or related literature to enhance understanding.

Textbook	NA
Reference book	NA
Contact	Mondays, 4:00 PM - 5:00 PM. Please contact in advance via email or other means.

Seminar on Functional Food Science
(1st year winter semester)

Registration code	61417	**Credits**	2
Instructor	KANOH Naomi	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target major**	Bioresource Science
How to use English	Handsout only		

・Purpose and Learning Goals

[Purpose]
To acquire advanced specialized knowledge and experimental techniques in functional food science, English paper reading comprehension, and presentation skills.

[Learning goals]
・To understand and explain specialized topics and experimental techniques in functional food science.
・To read English papers accurately and explain their contents clearly to others through presentations.

・Course Category (Relations to DP, CP and other courses)

This course aims to aquire advanced knowledge, experimental techniques, and problem-solving abilities related to functional food science to address diverse issues in local and international communities (DP and CP).

・Contents

[Teaching Methods]
Primarily face-to-face seminar, supplemented by remote teaching methods (web classes, Zoom). Students will take turns presenting PowerPoint materials prepared in advance.

[Schedule]
Sessions 1-15:
Students will individually read the latest English papers on functional food science, summarize them in PowerPoint presentations, and answer questions from fellow students and the teaching staff.

・Evaluation

[Criteria]
Evaluation will be based on the understanding of advanced specialized knowledge and experimental techniques in functional food science through reading and presenting English papers, as well as through question and answer sessions and discussions, with a passing grade set at 60 points out of 100.

[Methods]
Presentation: 60 points
Attitude toward participation in class (participation points, questions and answers, participation in discussions, etc.): 40 points

・Notice for Students

[Approach to Learning]
Presenters should thoroughly research any unclear points in English papers on functional food science, create PowerPoint materials that accurately convey the content to others, and prepare to answer questions from the audience. Audience members should actively listen, strive to understand the content, think critically, and ideally ask questions or share opinions at least once per session.

Textbook	NA
Reference book	NA
Contact	Mondays, 4:00 PM - 5:00 PM. Please contact in advance via email or other means.

Seminar on Functional Food Science
(2nd year summer semester)

Registration code	61418	**Credits**	2
Instructor	KANOH Naomi	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target major**	Bioresource Science
How to use English	Handsout only		

・Purpose and Learning Goals

[Purpose]
To acquire advanced specialized knowledge and experimental techniques in functional food science, English paper reading comprehension, and presentation skills.

[Learning goals]
・To understand and explain specialized topics and experimental techniques in functional food science.
・To read English papers accurately and explain their contents clearly to others through presentations.

・Course Category (Relations to DP, CP and other courses)

This course aims to aquire advanced knowledge, experimental techniques, and problem-solving abilities related to functional food science to address diverse issues in local and international communities (DP and CP).

・Contents

[Teaching Methods]
Primarily face-to-face seminar, supplemented by remote teaching methods (web classes, Zoom). Students will take turns presenting PowerPoint materials prepared in advance.

[Schedule]
Sessions 1-15:
Students will individually read the latest English papers on functional food science, summarize them in PowerPoint presentations, and answer questions from fellow students and the teaching staff.

・Evaluation

[Criteria]
Evaluation will be based on the understanding of advanced specialized knowledge and experimental techniques in functional food science through reading and presenting English papers, as well as through question and answer sessions and discussions, with a passing grade set at 60 points out of 100.

[Methods]
Presentation: 60 points
Attitude toward participation in class (participation points, questions and answers, participation in discussions, etc.): 40 points

・Notice for Students

[Approach to Learning]
Presenters should thoroughly research any unclear points in English papers on functional food science, create PowerPoint materials that accurately convey the content to others, and prepare to answer questions from the audience. Audience members should actively listen, strive to understand the content, think critically, and ideally ask questions or share opinions at least once per session.

[Advice for Study Outside of Class (Preparation/Review)]
Students should acquire foundational knowledge from textbooks and other materials related to functional food science. Also, students should research unclear points using reference books or related literature to enhance understanding.

Textbook	NA
Reference book	NA
Contact	Mondays, 4:00 PM - 5:00 PM. Please contact in advance via email or other means.

Seminar on Functional Food Science (2nd year winter semester)			
Registration code	61419	**Credits**	2
Instructor	KANOH Naomi	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target major**	Bioresource Science
How to use English	Handsout only		

・Purpose and Learning Goals

[Purpose]
To acquire advanced specialized knowledge and experimental techniques in functional food science, English paper reading comprehension, and presentation skills.

[Learning goals]
・To understand and explain specialized topics and experimental techniques in functional food science.
・To read English papers accurately and explain their contents clearly to others through presentations.

・Course Category (Relations to DP, CP and other courses)

This course aims to aquire advanced knowledge, experimental techniques, and problem-solving abilities related to functional food science to address diverse issues in local and international communities (DP and CP).

・Contents

[Teaching Methods]
Primarily face-to-face seminar, supplemented by remote teaching methods (web classes, Zoom). Students will take turns presenting PowerPoint materials prepared in advance.

[Schedule]
Sessions 1-15:
Students will individually read the latest English papers on functional food science, summarize them in PowerPoint presentations, and answer questions from fellow students and the teaching staff.

・Evaluation

[Criteria]
Evaluation will be based on the understanding of advanced specialized knowledge and experimental techniques in functional food science through reading and presenting English papers, as well as through question and answer sessions and discussions, with a passing grade set at 60 points out of 100.

[Methods]
Presentation: 60 points
Attitude toward participation in class (participation points, questions and answers, participation in discussions, etc.): 40 points

・Notice for Students

[Approach to Learning]
Presenters should thoroughly research any unclear points in English papers on functional food science, create PowerPoint materials that accurately convey the content to others, and prepare to answer questions from the audience. Audience members should actively listen, strive to understand the content, think critically, and ideally ask questions or share opinions at least once per session.

[Advice for Study Outside of Class (Preparation/Review)]
Students should acquire foundational knowledge from textbooks and other materials related to functional food science. Also, students should research unclear points using reference books or related literature to enhance understanding.

Textbook	NA
Reference book	NA
Contact	Mondays, 4:00 PM - 5:00 PM. Please contact in advance via email or other means.

Applied Metabolomics

Registration code	61357	**Credits**	1
Instructor	MIYAGI Atsuko	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioresource Science
How to use English	Japanese as the primary language (English is also used in conjunction)		

・Purpose and Learning Goals

The purpose of this seminar is to understand basic knowledge on metabolic biochemistry, especially in metabolomics of phytochemistry and food sciences. By the end of the course, students should be able to recognize basic information of metabolomics and metabolic biochemistry.

・Course Category (Relations to DP, CP and other courses)

Along with DP and CP of Bioresource Science program, the participants of this seminar can understand the concepts of metabolomics

・Contents

1. Metabolism
  1-1. Metabolites
  1-2. Metabolism
  1-3. Databases
2. Metabolomics
  2-1. Metabolomics
  2-2. Mass Spectrometers
  2-3. Bioinformatics for metabolomics
  2-4. Databases
3. Applications
  3-1. Characterization of unknown genes
  3-2. Visualization of metabolic disorders
  3-3. Localization and dynamics of metabolites
  3-4. Food metabolomics

・Evaluation

Comprehensive judgement from discussion on the lecture

・Notice for Students

Textbook	NA
Reference book	NA
Contact	miyagi@tds1.tr.yamagata-u.ac.jp

Seminar on Applied Metabolomics

（1st year summer semester）

Registration code	61340	**Credits**	1
Instructor	MIYAGI Atsuko	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioresource Science
How to use English	Japanese as the primary language (English is also used in conjunction)		

・Purpose and Learning Goals

The purpose of this seminar is to understand basic knowledge on metabolic biochemistry, especially in metabolomics of phytochemistry and food sciences. It also enhances the development of student's skills in carrying out a metabolomics experiment. By the end of the course, students should be able to do the following tasks:
- Recognize basic information of metabolomics and metabolic biochemistry
- Extract and prepare samples for metabolomic experiments
- Operate liquid chromatography and mass spectrometry basically

・Course Category (Relations to DP, CP and other courses)

Along with DP and CP of Bioresource Science program, the participants of this seminar can understand the basic concepts of metabolic biochemistry.

・Contents

This seminar consists of discussions and experiments of the student's theme in the labolatory.

・Evaluation

Comprehensive conclusion from the student's understanding, practice, and discussion of the study theme.

・Notice for Students

Textbook	NA
Reference book	NA
Contact	miyagi@tds1.tr.yamagata-u.ac.jp

Seminar on Applied Metabolomics

（1st year winter semester）

Registration code	61341	**Credits**	1
Instructor	MIYAGI Atsuko	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioresource Science
How to use English	Japanese as the primary language (English is also used in conjunction)		

・Purpose and Learning Goals

The purpose of this seminar is to understand basic knowledge on metabolic biochemistry, especially in metabolomics of phytochemistry and food sciences. It also enhances the development of student's skills in carrying out a metabolomics experiment. By the end of the course, students should be able to do the following tasks:

- Recognize basic information of metabolomics and metabolic biochemistry
- Extract and prepare samples for metabolomic experiments
- Operate liquid chromatography and mass spectrometry basically

・Course Category (Relations to DP, CP and other courses)

Along with DP and CP of Bioresource Science program, the participants of this seminar can understand the basic concepts of metabolic biochemistry.

・Contents

This seminar consists of discussions and experiments of the student's theme in the labolatory.

・Evaluation

Comprehensive conclusion from the student's understanding, practice, and discussion of the study theme.

・Notice for Students

Textbook	NA
Reference book	NA
Contact	miyagi@tds1.tr.yamagata-u.ac.jp

Seminar on Applied Metabolomics

（2nd year summer semester）

Registration code	61395	**Credits**	1
Instructor	MIYAGI Atsuko	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioresource Science
How to use English	Japanese as the primary language (English is also used in conjunction)		

・Purpose and Learning Goals

The purpose of this seminar is to understand basic knowledge on metabolic biochemistry, especially in metabolomics of phytochemistry and food sciences. It also enhances the development of student's skills in carrying out a metabolomics experiment. By the end of the course, students should be able to do the following tasks:
- Recognize basic information of metabolomics and metabolic biochemistry
- Extract and prepare samples for metabolomic experiments
- Operate liquid chromatography and mass spectrometry basically

・Course Category (Relations to DP, CP and other courses)

long with DP and CP of Bioresource Science program, the participants of this seminar can understand the detail concepts of metabolic biochemistry.

・Contents

This seminar consists of discussions and experiments of the student's theme in the labolatory.

・Evaluation

Comprehensive conclusion from the student's understanding, practice, and discussion of the study theme.

・Notice for Students

Textbook	NA
Reference book	NA
Contact	miyagi@tds1.tr.yamagata-u.ac.jp

Seminar on Applied Metabolomics

(2nd year Winter semester)

Registration code	61396	**Credits**	1
Instructor	MIYAGI Atsuko	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target major**	Bioresource Science
How to use English	Japanese as the primary language (English is also used in conjunction)		

・Purpose and Learning Goals

The purpose of this seminar is to understand basic knowledge on metabolic biochemistry, especially in metabolomics of phytochemistry and food sciences. It also enhances the development of student's skills in carrying out a metabolomics experiment. By the end of the course, students should be able to do the following tasks:
- Recognize basic information of metabolomics and metabolic biochemistry
- Extract and prepare samples for metabolomic experiments
- Operate liquid chromatography and mass spectrometry basically

・Course Category (Relations to DP, CP and other courses)

Along with DP and CP of Bioresource Science program, the participants of this seminar can understand the detail concepts of metabolic biochemistry.

・Contents

This seminar consists of discussions and experiments of the student's theme in the labolatory.

・Evaluation

Comprehensive conclusion from the student's understanding, practice, and discussion of the study theme.

・Notice for Students

Textbook	NA
Reference book	NA
Contact	miyagi@tds1.tr.yamagata-u.ac.jp

Seminar on Food and Nutritional Science

(1st year summer semester)

Registration code	61968	**Credits**	2
Instructor	KOBAYASHI Sho	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target major**	Bioresource Science
How to use English	Handsout only		

・Purpose and Learning Goals

The objective of this course is to provide students with adbanced specialized knowledge and skills in nutritional chemistry and food functional cehmistry, experimental techniques, English language skills, and presentation skills. The goals of this course are as follows.
1. The students should be able to explain the effects of food components on the maintenace of human health and the development of pathological conditions.
2. The students will acquire the ability to plan, execute, and verify research, scientific thinking skills, and presentation skills by introducing papers they have read carefully.

・Course Category (Relations to DP, CP and other courses)

This course is designed to provide students with advanced knowledge, skills, and experimental techniques related to nutritional chemistry and food functional chemistry, as well as ability to explore problem (Graduate School of Agricultural Science DP, CP).

・Contents

An overview of nutritional chemistry and food functional chemistry and how to prepare for the presentation will be given in the frist three classes. From the 4th class, students will take turns to prepare presentation materials (resumes and PowerPoint presentations) in advance and use them in the presentation.

・Evaluation

The grade for passing this course will be 60 or higher, based on comprehensive evaluation of the student's understanding of advanced specialized knowledge, techniques, and experimental methods related to nutritional chemistry and food functional chemistry through preparation, presentation, question-and-answer session, and discussion of paper introduction.

・Notice for Students

1. Students are expected to fully investigate the questions raised during a carefully reading of paper.
2. Students are expected to prepare well in advance (resume and power point presentation) and to make a presentation that can withstand question and answer session.
3. In discussions, students are expected to think scientifically and critically, and to ask questions and express their opinions.

Textbook	NA
Reference book	NA
Contact	anytime. Please firstly send me an Email. Email: skobayashi@tds1.tr.yamagata-u.ac.jp

Seminar on Food and Nutritional Science

(1st year winter semester)

Registration code	61969	**Credits**	2
Instructor	KOBAYASHI Sho	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target major**	Bioresource Science
How to use English	Handsout only		

・Purpose and Learning Goals

The objective of the this course is to provide students with advanced specialized knowledge and skills in nutritional chemistry and food functional chemistry, experimental techniques, English language skills, and presentation skills. The goals of this course are as follows.
1. The students should be able to explain the effects of food components on the maintenace of human health and the development of pathological conditions.
2. The students will acquire the ability to plan, execute, and verify research, scientific thinking skills, and presentation skills by introducing papers they have read carefully.

・Course Category (Relations to DP, CP and other courses)

This course is designed to provide students with advanced knowledge, skills, and experimental techniques related to nutritional chemistry and food functional chemistry, as well as ability to explore problem (Graduate School of Agricultural Science DP, CP).

・Contents

The course procedure will be explained in the first class. From the 2nd class, students will take turns to prepare presentation materials (resumes and PowerPoint presentations) in advance and use them in the presentation.

・Evaluation

The grade for passing this course will be 60 or higher, based on comprehensive evaluation of the student's understanding of advanced specialized knowledge, techniques, and experimental methods related to nutritional chemistry and food functional chemistry through preparation, presentation, question-and-answer session, and discussion of paper introduction.

・Notice for Students

1. Students are expected to fully investigate the questions raised during a carefully reading of paper.
2. Students are expected to prepare well in advance (resume and power point presentation) and to make a presentation that can withstand question and answer session.
3. In discussions, students are expected to think scientifically and critically, and to ask questions and express their opinions.

Textbook	NA
Reference book	NA
Contact	anytime. Please firstly send me an Email. Email: skobayashi@tds1.tr.yamagata-u.ac.jp

Seminar on Postharvest Physiology
(1st year summer semester)

Registration code	61338	**Credits**	2
Instructor	MURAYAMA Hideki	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioresource Science
How to use English	Handouts only		

・Purpose and Learning Goals

The aim of this course is to help students acquire an understanding of the fundamental principles of postharvest physiology. This also enhances the development of students' skills in making oral presentation and self-regulated learning.

・Course Category (Relations to DP, CP and other courses)

The aim of this seminar is to help students acquire the necessary skills and knowledge needed to achieve a better performance in their university studies.

・Contents

Each student introduces one recent paper appeared in journals having high impact factors. It is perfomed by using Power Point.

・Evaluation

Your overall grade in the class will be decided based on the following pattern:
- Class attendance and attitude in class: 50%
- Presentation: 50%

・Notice for Students

Prensent clearly and concisely to audiences. When other students present, ask questions positively.

Textbook	NA
Reference book	NA
Contact	16：10－17：10 on Monday

Seminar on Postharvest Physiology
(1st year winter semester)

Registration code	61339	**Credits**	2
Instructor	MURAYAMA Hideki	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioresource Science
How to use English	Handouts only		

・Purpose and Learning Goals

The aim of this course is to help students acquire an understanding of the fundamental principles of postharvest physiology. This also enhances the development of students' skills in making oral presentation and self-regulated learning.

・Course Category (Relations to DP, CP and other courses)

The aim of this seminar is to help students acquire the necessary skills and knowledge needed to achieve a better performance in their university studies.

・Contents

Each student introduces one recent paper appeared in journals having high impact factors. It is perfomed by using Power Point.

・Evaluation

Your overall grade in the class will be decided based on the following pattern:
- Class attendance and attitude in class: 50%
- Presentation: 50%

・Notice for Students

Prensent clearly and concisely to audiences. When other students present, ask questions positively.

Textbook	NA
Reference book	NA
Contact	16：10－17：10 on Monday

Seminar on Postharvest Physiology
(2nd year summer semester)

Registration code	61393	**Credits**	2
Instructor	MURAYAMA Hideki	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioresource Science
How to use English	Handouts only		

・Purpose and Learning Goals

The aim of this course is to help students acquire an understanding of the fundamental principles of postharvest physiology. This also enhances the development of students' skills in making oral presentation and self-regulated learning.

・Course Category (Relations to DP, CP and other courses)

The aim of this seminar is to help students acquire the necessary skills and knowledge needed to achieve a better performance in their university studies.

・Contents

Each student introduces one recent paper appeared in journals having high impact factors. It is perfomed by using Power Point.

・Evaluation

Your overall grade in the class will be decided based on the following pattern:
- Class attendance and attitude in class: 50%
- Presentation: 50%

・Notice for Students

Prensent clearly and concisely to audiences. When other students present, ask questions positively.

Textbook	NA
Reference book	NA
Contact	16：10－17：10 on Monday

Seminar on Postharvest Physiology
(2nd year winter semester)

Registration code	61394	**Credits**	2
Instructor	MURAYAMA Hideki	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioresource Science
How to use English	Handouts only		

・Purpose and Learning Goals

The aim of this course is to help students acquire an understanding of the fundamental principles of postharvest physiology. This also enhances the development of students' skills in making oral presentation and self-regulated learning.

・Course Category (Relations to DP, CP and other courses)

The aim of this seminar is to help students acquire the necessary skills and knowledge needed to achieve a better performance in their university studies.

・Contents

Each student introduces one recent paper appeared in journals having high impact factors. It is perfomed by using Power Point.

・Evaluation

Your overall grade in the class will be decided based on the following pattern:
- Class attendance and attitude in class: 50%
- Presentation: 50%

・Notice for Students

Prensent clearly and concisely to audiences. When other students present, ask questions positively.

Textbook	NA
Reference book	NA
Contact	16：10－17：10 on Monday

Postharvest Physiology

Registration code	61356	**Credits**	1
Instructor	MURAYAMA Hideki	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Lecture	**Target research area**	Bioresource Science
How to use English	Full use		

・Purpose and Learning Goals

The aim of this course is to help students acquire an understanding of the principles of postharvest physiololgy.

・Course Category (Relations to DP, CP and other courses)

The aim of this course is to help students acquire the necessary skills and knowledge needed to achieve a better performance in their university studies.

・Contents

1. Quality changes in agricultural products.
2. Fruit abscission
3. Ripening physiology
4. Chilling injury and physiological disorder

・Evaluation

Your overall grade in the class will be decided based on the following pattern:
- Class attendance and attitude in class: 50%
- Short reports: 50%

・Notice for Students

Textbook	NA
Reference book	NA
Contact	16：10－17：10 on Monday

Seminar on Soil Bioresource Science
(1st year summer semester)

Registration code	61346	**Credits**	2
Instructor	CHENG, Weiguo	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioresource Science
How to use English	Full use		

・Purpose and Learning Goals

To learn the latest frontier of soil science research.
To learn how soil use and management affect environmental issues.
To learn the latest knowledge of C and N dynamics in soil-plant ecosystems with greenhouse gas emissions.
To learn the latest knowledge of stable isotopes probing on biogeochemical processes.
To learn the latest knowledge of organic farming, etc.

・Course Category (Relations to DP, CP and other courses)

Soil science is the most basic course in agricultural and environmental sciences and ecology.
The knowledge of soil physics, soil chemistry and soil biology are applied in many scientific fields.

・Contents

In this weekly seminar, participatants introduce the newest journal papers and discuss the contents by oral presentation with other attendees.

・Evaluation

The evaluation will be based on an oral presentation from the presenter and attending attitude of participatants in discussion process.

・Notice for Students

Participants must take a positive attitude to attend the seminar and enjoy the discussion with presenters.

Textbook	NA
Reference book	NA
Contact	Please contact Prof. Cheng at cheng@tds1.tr.yamagata-u.ac.jp. The office hour is 16:00-17:30 pm on every Friday .

Seminar on Soil Bioresource Science
(1st year winter semester)

Registration code	61347	**Credits**	2
Instructor	CHENG, Weiguo	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioresource Science
How to use English	Full use		

・Purpose and Learning Goals

To learn the latest frontier of soil science research.
To learn how soil use and management affect environmental issues.
To learn the latest knowledge of C and N dynamics in soil-plant ecosystems with greenhouse gas emissions.
To learn the latest knowledge of stable isotopes probing on biogeochemical processes.
To learn the latest knowledge of organic farming, etc.

・Course Category (Relations to DP, CP and other courses)

Soil science is the most basic course in agricultural and environmental sciences and ecology.
The knowledge of soil physics, soil chemistry and soil biology are applied in many scientific fields.

・Contents

In this weekly seminar, participatants introduce the newest journal papers and discuss the contents by oral presentation with other attendees.

・Evaluation

The evaluation will be based on an oral presentation from the presenter and attending attitude of participatants in discussion process.

・Notice for Students

Participants must take a positive attitude to attend the seminar and enjoy the discussion with presenters.

Textbook	NA
Reference book	NA
Contact	Please contact Prof. Cheng at cheng@tds1.tr.yamagata-u.ac.jp. The office hour is 16:00-17:30 pm on every Friday .

Seminar on Soil Bioresource Science
(2nd year summer semester)

Registration code	61401	**Credits**	2
Instructor	CHENG, Weiguo	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioresource Science
How to use English	Full use		

・Purpose and Learning Goals

To learn the latest frontier of soil science research.
To learn how soil use and management affect environmental issues.
To learn the latest knowledge of C and N dynamics in soil-plant ecosystems with greenhouse gas emissions.
To learn the latest knowledge of stable isotopes probing on biogeochemical processes.
To learn the latest knowledge of organic farming, etc.

・Course Category (Relations to DP, CP and other courses)

Soil science is the most basic course in agricultural and environmental sciences and ecology.
The knowledge of soil physics, soil chemistry and soil biology are applied in many scientific fields.

・Contents

In this weekly seminar, participatants introduce the newest journal papers and discuss the contents by oral presentation with other attendees.

・Evaluation

The evaluation will be based on an oral presentation from the presenter and attending attitude of participatants in discussion process.

・Notice for Students

Participants must take a positive attitude to attend the seminar and enjoy the discussion with presenters.

Textbook	NA
Reference book	NA
Contact	Please contact Prof. Cheng at cheng@tds1.tr.yamagata-u.ac.jp. The office hour is 16:00-17:30 pm on every Friday .

Seminar on Soil Bioresource Science
(2nd year winter semester)

Registration code	61402	**Credits**	2
Instructor	CHENG, Weiguo	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioresource Science
How to use English	Full use		

・Purpose and Learning Goals

To learn the latest frontier of soil science research.
To learn how soil use and management affect environmental issues.
To learn the latest knowledge of C and N dynamics in soil-plant ecosystems with greenhouse gas emissions.
To learn the latest knowledge of stable isotopes probing on biogeochemical processes.
To learn the latest knowledge of organic farming, etc.

・Course Category (Relations to DP, CP and other courses)

Soil science is the most basic course in agricultural and environmental sciences and ecology.
The knowledge of soil physics, soil chemistry and soil biology are applied in many scientific fields.

・Contents

In this weekly seminar, participatants introduce the newest journal papers and discuss the contents by oral presentation with other attendees.

・Evaluation

The evaluation will be based on an oral presentation from the presenter and attending attitude of participatants in discussion process.

・Notice for Students

Participants must take a positive attitude to attend the seminar and enjoy the discussion with presenters.

Textbook	NA
Reference book	NA
Contact	Please contact Prof. Cheng at cheng@tds1.tr.yamagata-u.ac.jp. The office hour is 16:00-17:30 pm on every Friday .

Soil Bioresource Science

Registration code	61360	**Credits**	1
Instructor	CHENG, Weiguo	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Lecture	**Target research area**	Bioresource Science
How to use English	Full use		

・Purpose and Learning Goals

To learn the latest frontier of soil science research.
To learn how soil use and management affect environmental issues.
To learn the latest knowledge of C and N dynamics in soil-plant ecosystems with greenhouse gas emissions.
To learn the latest knowledge of stable isotopes probing on biogeochemical processes.
To learn the latest knowledge of organic farming, etc.

・Course Category (Relations to DP, CP and other courses)

Soil science is the most basic course in agricultural and environmental sciences and ecology.
The knowledge of soil physics, soil chemistry and soil biology are applied in many scientific fields.

・Contents

This lecture course will introduce the latest knowledges of soil sciences to students.
The main contents are:
1. Carbon and nitrogen dynamics in different terrestrial ecosystems;
2. Stable isotopes probing on bio-geochemical processes;
3. Greenhouse gas emissions with global warming;
4. Organic rice farming;
5. Compost etc.

・Evaluation

The evaluation will be based on the attending attitude and tests.

・Notice for Students

Participants must take a positive attitude to attend the lecture and try to discuss with lecturer.

Textbook	No textbook is required for the course. Lecturer will hand out the prints for the lecture.
Reference book	Journal papers published by Prof. Cheng http://www.tr.yamagata-u.ac.jp/~cheng/
Contact	Please contact Prof. Cheng at cheng@tds1.tr.yamagata-u.ac.jp. The office hour is 16:00-17:30 pm on every Friday .

Seminar on Plant Nutrition
(1st year summer semester)

Registration code	61344	**Credits**	2
Instructor	TAWARAYA Keitaro	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioresource Science
How to use English	Full use		

・Purpose and Learning Goals

The purpose of this course is to learn new knowledge of plant nutrition. The learning goal of this course is to obtain novel findings, research techniques, and application on research of plant nutrition.

・Course Category (Relations to DP, CP and other courses)

To discuss plant nutrition with wide viewpoints and to obtain wide knowledge.

・Contents

Reading, presentation, discussion about new publications related to plant nutrition

・Evaluation

Your overall grade in the class will be decided based on class attendance, oral presentation, and discussion.

・Notice for Students

Students have to read handouts before course and prepare topics to discuss.

Textbook	Original handouts will be prepaed and used.
Reference book	Original handouts will be prepaed and used.
Contact	16:00-18:00 Friday

Seminar on Plant Nutrition
(1st year winter semester)

Registration code	61345	**Credits**	2
Instructor	TAWARAYA Keitaro	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioresource Science
How to use English	Full use		

・Purpose and Learning Goals

The purpose of this course is to learn new knowledge of plant nutrition. The learning goal of this course is to obtain novel findings, research techniques, and application on research of plant nutrition.

・Course Category (Relations to DP, CP and other courses)

To discuss plant nutrition with wide viewpoints and to obtain wide knowledge.

・Contents

Reading, presentation, discussion about new publications related to plant nutrition

・Evaluation

Your overall grade in the class will be decided based on class attendance, oral presentation, and discussion.

・Notice for Students

Students have to read handouts before course and prepare topics to discuss.

Textbook	Original handouts will be prepaed and used.
Reference book	Original handouts will be prepaed and used.
Contact	16:00-18:00 Friday

Seminar on Plant Nutrition
(2nd year summer semester)

Registration code	61399	**Credits**	2
Instructor	TAWARAYA Keitaro	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioresource Science
How to use English	Full use		

・Purpose and Learning Goals

The purpose of this course is to learn new knowledge of plant nutrition. The learning goal of this course is to obtain novel findings, research techniques, and application on research of plant nutrition.

・Course Category (Relations to DP, CP and other courses)

To discuss plant nutrition with wide viewpoints and to obtain wide knowledge.

・Contents

Reading, presentation, discussion about new publications related to plant nutrition

・Evaluation

Your overall grade in the class will be decided based on class attendance, oral presentation, and discussion.

・Notice for Students

Students have to read handouts before course and prepare topics to discuss.

Textbook	Original handouts will be prepaed and used.
Reference book	Original handouts will be prepaed and used.
Contact	16:00-18:00 Friday

Seminar on Plant Nutrition
(2nd year winter semester)

Registration code	61400	**Credits**	2
Instructor	TAWARAYA Keitaro	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioresource Science
How to use English	Full use		

・Purpose and Learning Goals

The purpose of this course is to learn new knowledge of plant nutrition. The learning goal of this course is to obtain novel findings, research techniques, and application on research of plant nutrition.

・Course Category (Relations to DP, CP and other courses)

To discuss plant nutrition with wide viewpoints and to obtain wide knowledge.

・Contents

Reading, presentation, discussion about new publications related to plant nutrition

・Evaluation

Your overall grade in the class will be decided based on class attendance, oral presentation, and discussion.

・Notice for Students

Students have to read handouts before course and prepare topics to discuss.

Textbook	Original handouts will be prepaed and used.
Reference book	Original handouts will be prepaed and used.
Contact	16:00-18:00 Friday

Plant Nutrition

Registration code	61359	**Credits**	1
Instructor	TAWARAYA Keitaro	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Lecture	**Target research area**	Bioresource Science
How to use English	Full use		

・Purpose and Learning Goals

The purpose of this course is to learn new knowledge of plant nutrition. The learning goal of this course is to obtain novel findings, research techniques, and application on research of plant nutrition.

・Course Category (Relations to DP, CP and other courses)

To discuss plant nutrition with wide viewpoints and to obtain wide knowledge.

・Contents

Introducition, phosphorus resource, low nutrient tolerance of plant, role of symbiotic microorganisms in plant growth, application of microoganisms in agriculture, forestry, and phytoremediation.

・Evaluation

Your overall grade in the class will be decided based on class attendance, oral presentation, and discussion.

・Notice for Students

This couse will be taught in English.

Textbook	Original handouts will be prepaed and used.
Reference book	Original handouts will be prepaed and used.
Contact	16:00-18:00 Friday

Bioorganic Chemistry

Registration code	61362	**Credits**	1
Instructor	ABOSHI Takako	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Lecture	**Target research area**	Bioresource Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The aim of this course is to help students acquire the necesarry skills and knowledge needed to identify unknown chemicals by MS, IR, and NMR. It also enhances the development of students' skills in making oral presentation and self-regulated learning.

・Course Category (Relations to DP, CP and other courses)

This course help students acquire the skills of self-regulated learning and solving highly technical problems (DP and CP of bioresource science).

・Contents

1. Alcohols
2. Ketones
3. Aldehydes
4. Halides
5. Aromatic compounds

・Evaluation

Evaluation will be based on attendance and assesment of performance in the class.

・Notice for Students

The students are expected to attend all classes, solve the problems using various spectra and make an oral presentation.

Textbook	handouts
Reference book	Will be introduced in the class.
Contact	Anytime

Seminar on Functional Genomics and Biochemistry (1st year summer semester)

Registration code	61972	**Credits**	2
Instructor	KIMURA Yuri	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target major**	Bioresource Science
How to use English	To interpret Japanene as main language		

・Purpose and Learning Goals

Through close reading of scientific papers on plant metabolism and their evolution, students will acquire cutting-edge knowledge in the related field. Additionally, they will develop presentation skills to effectively communicate scientific research to others.

・Course Category (Relations to DP, CP and other courses)

Along with the DP of Graduate School of Agricultural Sciences, this course is designed to equip students with advanced knowledge and problem-solving skills related to the metabolism in plant cells.

・Contents

Each week, one or two designated individuals will give a presentation. Participants will listen to and engage in discussions about the presentations.

・Evaluation

Comprehensive evaluation will be conducted based on several factors, including understanding of the papers, the quality of the presentation, and active participation in the discussion.

・Notice for Students

To develop an interest in each research topic, it is essential to read relevant papers on a daily basis and accumulate the necessary knowledge.

Textbook	The textbook will be a scientific paper distributed each class
Reference book	General textbooks on biochemistry, molecular biology and plant science
Contact	anytime

Seminar on Functional Genomics and Biochemistry (1st year winter semester)

Registration code	61973	**Credits**	2
Instructor	KIMURA Yuri	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target major**	Bioresource Science
How to use English	To interpret Japanene as main language		

・Purpose and Learning Goals

Through close reading of scientific papers on plant metabolism and their evolution, students will acquire cutting-edge knowledge in the related field. Additionally, they will develop presentation skills to effectively communicate scientific research to others.

・Course Category (Relations to DP, CP and other courses)

Along with the DP of Graduate School of Agricultural Sciences, this course is designed to equip students with advanced knowledge and problem-solving skills related to the metabolism in plant cells.

・Contents

Each week, one or two designated individuals will give a presentation. Participants will listen to and engage in discussions about the presentations.

・Evaluation

Comprehensive evaluation will be conducted based on several factors, including understanding of the papers, the quality of the presentation, and active participation in the discussion.

・Notice for Students

To develop an interest in each research topic, it is essential to read relevant papers on a daily basis and accumulate the necessary knowledge.

Textbook	The textbook will be a scientific paper distributed each class
Reference book	General textbooks on biochemistry, molecular biology and plant science
Contact	anytime

Functional Genomics and Biochemistry

Registration code	61937	**Credits**	1
Instructor	KIMURA Yuri	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target major**	Bioresource Science
How to use English	Full use		

・Purpose and Learning Goals

Plant metabolism and its evolutionary changes will be introduced in this class, with a focus on the latest research in cell wall biosynthesis. Through this approach, students will develop an understand of and be able to discuss biochemical phenomena related to intracellular metabolism of substances and their evolutionary history.

・Course Category (Relations to DP, CP and other courses)

Along with the DP of Graduate School of Agricultural Sciences, this seminar aims to acquire advanced knowledge of plant metabolism and its evolution.

・Contents

The following research topics will be introduced:
(1) Metabolite diversification during plant evolution
(2) Primary and specialized metabolism in plants
(3) Plant cell wall biosynthesis and its diversity
(4) Molecular regulation of plant cell wall synthesis
(5) Cell wall structural modification through metabolic engineering

・Evaluation

Evaluation will be based on the content of discussion, including questions raised during the lecture and the quality of the post-lecture report.

・Notice for Students

Your active participation in the discussion will be expected.

Textbook	Handouts will be provided in the classes
Reference book	References will be introduced in the classes
Contact	Please email me in advance to make an appointment to come to the office

Seminar on Molecular Animal Reproduction and Development
(1st year summer semester)

Registration code	61309	**Credits**	2
Instructor	KIMURA Naoko	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioresource Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

This course introduces molecular mechanisms of reproduction and development in mammals to students taking this course. It also deal with analysis techniques and approaches for this reserch.
The goals of this course are to
1. be able to understand and explain molecular mechanisms of reproduction and development in mammals. 2. be able to discuss various aspects of reproductive physiology. 3. to be able to recognize cutting edge experimental technics.

・Course Category (Relations to DP, CP and other courses)

Based on undergraduate classes of "Molecular Animal Reproduction and Development" and "Animal Reproductive Bioengineering", the aim of this course is to help students acquire an greater understanding of the fundamental principles of reproductive biology.

・Contents

This course will be divided in 4 steps as follows. Reading reserch articles or reviews in the region of animal reproductive physiology and animal reproductive bioengineering, writing research report's resume, presentation of the resume, questions and answers.

・Evaluation

Grading will be decided based on attendance, reports, and the quality of the students' resume and presentation and questions and answers . To pass, students must earn at least 60 points out of 100.

・Notice for Students

Textbook	NA
Reference book	NA
Contact	E-mail:naonao@tds1.tr.yamagata-u.ac.jp

Seminar on Molecular Animal Reproduction and Development
(1st year winter semester)

Registration code	61310	**Credits**	2
Instructor	KIMURA Naoko	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioresource Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

This course introduces molecular mechanisms of reproduction and development in mammals to students taking this course. It also deal with analysis techniques and approaches for this reserch.
The goals of this course are to
1. be able to understand and explain molecular mechanisms of reproduction and development in mammals. 2. be able to discuss various aspects of reproductive physiology. 3. to be able to recognize cutting edge experimental technics.

・Course Category (Relations to DP, CP and other courses)

Based on undergraduate classes of "Molecular Animal Reproduction and Development" and "Animal Reproductive Bioengineering", the aim of this course is to help students acquire an greater understanding of the fundamental principles of reproductive biology.

・Contents

This course will be divided in 4 steps as follows. Reading reserch articles or reviews in the region of animal reproductive physiology and animal reproductive bioengineering, writing research report's resume, presentation of the resume, questions and answers.

・Evaluation

Grading will be decided based on attendance, reports, and the quality of the students' resume and presentation and questions and answers . To pass, students must earn at least 60 points out of 100.

・Notice for Students

Textbook	NA
Reference book	NA
Contact	E-mail:naonao@tds1.tr.yamagata-u.ac.jp

Seminar on Molecular Animal Reproduction and Development
(2nd year summer semester)

Registration code	61373	**Credits**	2
Instructor	KIMURA Naoko	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioresource Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

This course introduces molecular mechanisms of reproduction and development in mammals to students taking this course. It also deal with analysis techniques and approaches for this reserch.
The goals of this course are to
1. be able to understand and explain molecular mechanisms of reproduction and development in mammals. 2. be able to discuss various aspects of reproductive physiology. 3. to be able to recognize cutting edge experimental technics.

・Course Category (Relations to DP, CP and other courses)

Based on undergraduate classes of "Molecular Animal Reproduction and Development" and "Animal Reproductive Bioengineering", the aim of this course is to help students acquire an greater understanding of the fundamental principles of reproductive biology.

・Contents

This course will be divided in 4 steps as follows. Reading reserch articles or reviews in the region of animal reproductive physiology and animal reproductive bioengineering, writing research report's resume, presentation of the resume, questions and answers.

・Evaluation

Grading will be decided based on attendance, reports, and the quality of the students' resume and presentation and questions and answers . To pass, students must earn at least 60 points out of 100.

・Notice for Students

Textbook	NA
Reference book	NA
Contact	E-mail:naonao@tds1.tr.yamagata-u.ac.jp

Seminar on Molecular Animal Reproduction and Development
(2nd year winter semester)

Registration code	61374	**Credits**	2
Instructor	KIMURA Naoko	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioresource Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

This course provides an overview of the latest findings of in order to understand the molecular mechanisms and physiological significance of reproductive phenomena, mainly in mammals, and to consider the significance and challenges of field applications of developmental and reproductive engineering. The goals of this course are to 1. To able to discuss the molecular mechanisms of mammalian reproductive physiology with a high level of expertise; 2. To be able to appropriately discuss the molecular functions and physiological significance of various reproductive physiological phenomena in mammals; 3. To be able to give an overview of the latest experimental techniques in the life sciences, and be able to perform some of them.

・Course Category (Relations to DP, CP and other courses)

Based on undergraduate classes of "Molecular Animal Reproduction and Development", the aim of this course is to help students acquire an greater understanding of the fundamental principles of reproductive biology.

・Contents

Reproductive lineage cell formation, function of male and female gonads, fertilization, embryogenesis, implantation, and general reproductive engineering techniques. The relationship between the above keywords and aging, oxidative stress, environmental chemicals and other related topics. This course will be divided in 4 steps as follows. Reading reserch articles or reviews in the region of animal reproductive physiology and animal reproductive bioengineering, writing research report's resume, presentation of the resume, questions and answers.

・Evaluation

Grading will be decided based on attendance, reports, and the quality of the students' resume and presentation and questions and answers . To pass, students must earn at least 60 points out of 100.

・Notice for Students

This lecture assumes that students have already mastered the undergraduate courses "Basic Animal Physiology" and "Animal Molecular Reproduction".

Textbook	NA
Reference book	NA
Contact	E-mail:naonao@tds1.tr.yamagata-u.ac.jp

Forest Digitalization

Registration code	61940	**Credits**	1
Instructor	Larry Lopez	**Coordinator** in case of invited lectures	
Academic year	1st/2nd	**Semester**	Winter
Style of course	Lecture	**Target major**	Bioenvironment
Language	English and Japanese (Depending on the students)		

・Purpose and Learning Goals

The purpose of this course is to provide students with knowledge and the ability to acquire enough experience for an efficient application of precise remote sensing on the field of forestry. After this course, students will be able to understand the principle of UAVs, the knowledge involved in planning UAV flights as well as the criteria needed to solve problems during field image collection. They will also be able to analyze images using relevant software such as Metashape, ArcGIS (or QGIS) and Global Mapper. Students will also be introduced to the use of these images for Deep Learning Model applications.

・Course Category (Relations to DP, CP and other courses)

DP Humanity (1), (2); In-depth specialized knowledge/skills (1) and the capacity of understand diverse cultures (2).
CP Curriculum composition and implementation (2); Teaching methods (1) and (2).

・Contents

The course will be held in the form of an intensive lectures. The content is as follows:
Class 1: Comparison of satellites and UAVs.
Class 2 UAVs and Sensors.
Class 3: Flight Plans for UAVs.
Class 4: Principles of Image Processing (Metashape)
Class 5: Data provided from Orthomosaic, Dense Point Cloud and Digital Elevation Model.
Class 6: Manual annotation of relevant vegetation in processed images.
Class 7: Forest 3D data analysis and 3D Printing.
Class 8: Summary and Exam

・Evaluation

A comprehensive evaluation will be made of the students' attitude in the seminar (30 points), reports (30 points) and Final Exam (40 points).

・Notice for Students

Handouts and videos (youtube) will be provided in advance, normally in English. Students should actively participate in the class and follow the discussion sessions with other students. The evaluation criteria include being able to understand and use the new technology explained in the course.

Textbook	Scientific Publications recommended in class
Reference book	Unmanned Aerial Systems: Theoretical Foundation and Applications. Editors: Anis Koubaa, Ahmad Taher Azar Paperback ISBN: 9780128202760/eBook ISBN: 9780128202777
Contact	Anytime

Seminar on Precise Forest Management
（1st year summer semester）

Registration code	61976	**Credits**	2
Instructor	Larry Lopez	**Coordinator** in case of invited lectures	
Academic year	1st	**Semester**	summer
Style of course	Seminar	**Target major**	Bioenvironment
Language	English and Japanese (Depending on the students)		

・Purpose and Learning Goals

The objective of this course is to provide students with knowledge and the experience for an efficient application of precise remote sensing on forestry. Students will be able to understand the principle of UAVs, the knowledge involved in planning UAV flights as well as the criteria needed to solve problems during field image collection. They will also be able to analyze images using relevant software such as Metashape, ArcGIS (or QGIS) and Global Mapper. Students will also present scientific papers from related studies that they have to discuss with other students in weekly seminars.

・Course Category (Relations to DP, CP and other courses)

DP Humanity (1), (2); In-depth specialized knowledge/skills (1) and the capacity of understand diverse cultures (2).
CP Curriculum composition and implementation (2); Teaching methods (1) and (2).

・Contents

Seminar format: Face-to-face and online:
Seminar 1: Introduction of the activities in the semester.
Seminar 2-5: Students' presentations of scientific papers.
Seminar 6-7: Practical classes in Forest Research Sites.
Seminar 8: Overall Discussion of studies presented.
Seminar 9-12: Students' presentations of scientific papers.
Seminar 13-14: Discussion and Presentation of Students' own studies.
Seminar 15: Overall Discussion of topics dealt with in the semester .
Class 8: Summary and Exam

・Evaluation

A comprehensive evaluation will be made of the students' attitude in the seminar (40 points), reports (40 points) and Final Exam (20 points).

・Notice for Students

I will explain the classes in Japanese and write the slides in English or vice-versa. Please feel free to ask when something is not clear.

Textbook	Scientific Publications recommended in class
Reference book	Unmanned Aerial Systems: Theoretical Foundation and Applications. Editors: Anis Koubaa, Ahmad Taher Azar Paperback ISBN: 9780128202760/eBook ISBN: 9780128202777
Contact	Anytime

Seminar on Precise Forest Management
（1st year winter semester）

Registration code	61977	**Credits**	2
Instructor	Larry Lopez	**Coordinator** in case of invited lectures	
Academic year	1st	**Semester**	Winter
Style of course	Seminar	**Target major**	Bioenvironment
Language	English and Japanese (Depending on the students)		

・Purpose and Learning Goals

The objective of this course is to provide students with knowledge and the experience for an efficient application of precise remote sensing on forestry. Students will be able to understand the principle of UAVs, the knowledge involved in planning UAV flights as well as the criteria needed to solve problems during field image collection. They will also be able to analyze images using relevant software such as Metashape, ArcGIS (or QGIS) and Global Mapper. Students will also present scientific papers from related studies that they have to discuss with other students in weekly seminars.

・Course Category (Relations to DP, CP and other courses)

DP Humanity (1), (2); In-depth specialized knowledge/skills (1) and the capacity of understand diverse cultures (2).
CP Curriculum composition and implementation (2); Teaching methods (1) and (2).

・Contents

Seminar format: Face-to-face and online:
Seminar 1: Introduction of the activities in the semester.
Seminar 2-5: Students' presentations of scientific papers.
Seminar 6-7: Practical classes in Forest Research Sites.
Seminar 8: Overall Discussion of studies presented.
Seminar 9-12: Students' presentations of scientific papers.
Seminar 13-14: Discussion and Presentation of Students' own studies.
Seminar 15: Overall Discussion of topics dealt with in the semester .
Class 8: Summary and Exam

・Evaluation

A comprehensive evaluation will be made of the students' attitude in the seminar (40 points), reports (40 points) and Final Exam (20 points).

・Notice for Students

I will explain the classes in Japanese and write the slides in English or vice-versa. Please feel free to ask when something is not clear.

Textbook	Scientific Publications recommended in class
Reference book	Unmanned Aerial Systems: Theoretical Foundation and Applications. Editors: Anis Koubaa, Ahmad Taher Azar Paperback ISBN: 9780128202760/eBook ISBN: 9780128202777
Contact	Anytime

Seminar on Precise Forest Management
（2nd year summer semester）

Registration code	61978	**Credits**	2
Instructor	Larry Lopez	**Coordinator** in case of invited lectures	
Academic year	2nd	**Semester**	Summer
Style of course	Seminar	**Target major**	Bioenvironment
Language	English and Japanese (Depending on the students)		

・Purpose and Learning Goals

The objective of this course is to provide students with knowledge and the experience for an efficient application of precise remote sensing on forestry. Students will be able to understand the principle of UAVs, the knowledge involved in planning UAV flights as well as the criteria needed to solve problems during field image collection. They will also be able to analyze images using relevant software such as Metashape, ArcGIS (or QGIS) and Global Mapper. Students will also present scientific papers from related studies that they have to discuss with other students in weekly seminars.

・Course Category (Relations to DP, CP and other courses)

DP Humanity (1), (2); In-depth specialized knowledge/skills (1) and the capacity of understand diverse cultures (2).
CP Curriculum composition and implementation (2); Teaching methods (1) and (2).

・Contents

Seminar format: Face-to-face and online:
Seminar 1: Introduction of the activities in the semester.
Seminar 2-5: Students' presentations of scientific papers.
Seminar 6-7: Practical classes in Forest Research Sites.
Seminar 8: Overall Discussion of studies presented.
Seminar 9-12: Students' presentations of scientific papers.
Seminar 13-14: Discussion and Presentation of Students' own studies.
Seminar 15: Overall Discussion of topics dealt with in the semester .
Class 8: Summary and Exam

・Evaluation

A comprehensive evaluation will be made of the students' attitude in the seminar (40 points), reports (40 points) and Final Exam (20 points).

・Notice for Students

I will explain the classes in Japanese and write the slides in English or vice-versa. Please feel free to ask when something is not clear.

Textbook	Scientific Publications recommended in class
Reference book	Unmanned Aerial Systems: Theoretical Foundation and Applications. Editors: Anis Koubaa, Ahmad Taher Azar Paperback ISBN: 9780128202760/eBook ISBN: 9780128202777
Contact	Anytime

Seminar on Precise Forest Management
（2nd year winter semester）

Registration code	61979	**Credits**	2
Instructor	Larry Lopez	**Coordinator** in case of invited lectures	
Academic year	2nd	**Semester**	Winter
Style of course	Seminar	**Target major**	Bioenvironment
Language	English and Japanese (Depending on the students)		

・Purpose and Learning Goals

The objective of this course is to provide students with knowledge and the experience for an efficient application of precise remote sensing on forestry. Students will be able to understand the principle of UAVs, the knowledge involved in planning UAV flights as well as the criteria needed to solve problems during field image collection. They will also be able to analyze images using relevant software such as Metashape, ArcGIS (or QGIS) and Global Mapper. Students will also present scientific papers from related studies that they have to discuss with other students in weekly seminars.

・Course Category (Relations to DP, CP and other courses)

DP Humanity (1), (2); In-depth specialized knowledge/skills (1) and the capacity of understand diverse cultures (2).
CP Curriculum composition and implementation (2); Teaching methods (1) and (2).

・Contents

Seminar format: Face-to-face and online:
Seminar 1: Introduction of the activities in the semester.
Seminar 2-5: Students' presentations of scientific papers.
Seminar 6-7: Practical classes in Forest Research Sites.
Seminar 8: Overall Discussion of studies presented.
Seminar 9-12: Students' presentations of scientific papers.
Seminar 13-14: Discussion and Presentation of Students' own studies.
Seminar 15: Overall Discussion of topics dealt with in the semester .
Class 8: Summary and Exam

・Evaluation

A comprehensive evaluation will be made of the students' attitude in the seminar (40 points), reports (40 points) and Final Exam (20 points).

・Notice for Students

I will explain the classes in Japanese and write the slides in English or vice-versa. Please feel free to ask when something is not clear.

Textbook	Scientific Publications recommended in class
Reference book	Unmanned Aerial Systems: Theoretical Foundation and Applications. Editors: Anis Koubaa, Ahmad Taher Azar Paperback ISBN: 9780128202760/eBook ISBN: 9780128202777
Contact	Anytime

Forest Disturbances and Conservation

Registration code	61598	**Credits**	1
Instructor	KIKUCHI Shun-ichi	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Lecture	**Target research area**	Bioenvironmental Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The purpose of this lecture is to acquire knowledge about foerst disturbances by means of reading related research articles. The goal of this lecture is to construct original logic that how to conserve and restore the interaction between forest ecosystem and surrounding environment.

・Course Category (Relations to DP, CP and other courses)

This lecture is to acquire in-depth specialized knowledge and a wide perspective based on integrated sciences.

・Contents

1. Forest plant development and environmental influences 2. What is forest disturbance? 3. Forest plant response to dynamic environmental changes 4. Forest effects on environment factors 5.Environmental conservation function of foest 6. How to develop conservation and restoration of the forest ecosystem?

・Evaluation

Grading will be decided based on class attendance and attitude in class (20%) and final report (80%).

・Notice for Students

Your active participation in discussion is expected. Before and after class hour learning will enhance your learning performance.

Textbook	Handouts will be provided in the classes.
Reference book	River Futures: An integrative scientific approach to river repair: Gary Brierley and Kirstie Fryirs, Island Press, ISBN-10:1-59726-1 12-2 Plant Disturbance Ecology: Edward johnson and Kiyoko Miyanishi, Academic Press, ISBN-10:0-12-088778-9
Contact	The office is on the 5th floor of the 2nd building. You can contact me anytime via e-mail (kikku@tds1.tr.yamagata-u.ac.jp).

Resource Economics

Registration code	61596	**Credits**	1
Instructor	OGAWA Sanshiro	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Lecture	**Target research area**	Bioenvironmental Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The purpose of this course is to consider resource issues from both nature and society perspectives. The goals of this course are to learn how to collect and analyze materials on resource issues and to learn about scientific criticism.

・Course Category (Relations to DP, CP and other courses)

This course is to obtain "the capacity to perform planning of survey and experiment, implementation, data analysis and discussion for solution of problems" in the diploma policy of Deparment of Bioenvironmental Science.

・Contents

1. Explanation of lesson plan（1st class）
2. Introduction of literature and significance of literature（2nd class）
3. Reading literature by seminar form（3rd to 12th classes）
4. Discussion on comprehensive report and summary of lecture form（13th to 14th classes）
5. Supplement（15th class）

・Evaluation

Grading will be decided based on class attendance and attitude in class (30%) and final report (70%).

・Notice for Students

NA

Textbook	Designate documents
Reference book	Baskin Yvonne, The work of nature, DIAMOND,Inc., 2001.
Contact	The office of the instructor is on the 5th floor of the 2nd building. You can contact him anytime via email.

Seminar on Resource Economics
(1st year summer semester)

Registration code	61515	**Credits**	2
Instructor	OGAWA Sanshiro	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioenvironmental Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The purpose of this course is to understand the decentralized and traditional resource management system based on the biodiversity principle. The goal of this course is to be able to consider the change of forest resources as a social phenomenon based on the results of artificial history by human society as well as natural phenomena.

・Course Category (Relations to DP, CP and other courses)

This course is to obtain "the capacity to perform planning of survey and experiment, implementation, data analysis and discussion for solution of problems" in the diploma policy of Deparment of Bioenvironmental Science.

・Contents

1. History of human society and resource utilization（1st to 3rd classes）
2. Economic development and environmental conservation issues（4th to 6th classes）
3. Background to the establishment of the principle of biodiversity（7th to 9th classes）
4. Development of sustainable management（10th to 12th classes）
5. How decentralized traditional resource management system should be（13th to 15th classes）

・Evaluation

Grading will be decided based on class attendance and attitude in class (30%) and final report (70%).

・Notice for Students

NA

Textbook	Designate documents
Reference book	Designate documents
Contact	The office of the instructor is on the 5th floor of the 2nd building. You can contact him anytime via email.

Seminar on Resource Economics
(1st year winter semester)

Registration code	61516	**Credits**	2
Instructor	OGAWA Sanshiro	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioenvironmental Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The purpose of this course is to understand the decentralized and traditional resource management system based on the biodiversity principle. The goal of this course is to be able to consider the change of forest resources as a social phenomenon based on the results of artificial history by human society as well as natural phenomena.

・Course Category (Relations to DP, CP and other courses)

This course is to obtain "the capacity to perform planning of survey and experiment, implementation, data analysis and discussion for solution of problems" in the diploma policy of Deparment of Bioenvironmental Science.

・Contents

1. History of human society and resource utilization（1st to 3rd classes）
2. Economic development and environmental conservation issues（4th to 6th classes）
3. Background to the establishment of the principle of biodiversity（7th to 9th classes）
4. Development of sustainable management（10th to 12th classes）
5. How decentralized traditional resource management system should be（13th to 15th classes）

・Evaluation

Grading will be decided based on class attendance and attitude in class (30%) and final report (70%).

・Notice for Students

NA

Textbook	Designate documents
Reference book	Designate documents
Contact	The office of the instructor is on the 5th floor of the 2nd building. You can contact him anytime via email.

Seminar on Resource Economics
(2nd year summer semester)

Registration code	61632	**Credits**	2
Instructor	OGAWA Sanshiro	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioenvironmental Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The purpose of this course is to understand the policy of resource management based on the actual situation about human life and resource utilization. The goals of this course are to be able to learn about management problems of forest resources and to think about how to manage forest resources based on field survey.

・Course Category (Relations to DP, CP and other courses)

This course is to obtain "the capacity to perform planning of survey and experiment, implementation, data analysis and discussion for solution of problems" in the diploma policy of Deparment of Bioenvironmental Science.

・Contents

1. Introduction（1st class）
2. Land conservation and forest management issues（2nd to 3rd classes）
3. Diffusion and development of forest management tools（4th to 6th classes）
4. Current status of using forest management tools（7th to 9th classes）
5. Problems of using forest management tools（10th to 11th classes）
6. Tasks of forest resource use and regional management（12th to 13th classes）
7. The way of homeland conservation and pluralistic management（14th to 15th classes）

（The above is a schedule and may be changed.）

・Evaluation

Grading will be decided based on class attendance and attitude in class (30%) and final report (70%).

・Notice for Students

NA

Textbook	Designate documents
Reference book	Designate documents
Contact	The office of the instructor is on the 5th floor of the 2nd building. You can contact him anytime via email.

Seminar on Resource Economics
(2nd year winter semester)

Registration code	61633	**Credits**	2
Instructor	OGAWA Sanshiro	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioenvironmental Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The purpose of this course is to understand the decentralized and traditional resource management system based on the biodiversity principle. The goal of this course is to be able to consider the change of forest resources as a social phenomenon based on the results of artificial history by human society as well as natural phenomena.

・Course Category (Relations to DP, CP and other courses)

This course is to obtain "the capacity to perform planning of survey and experiment, implementation, data analysis and discussion for solution of problems" in the diploma policy of Deparment of Bioenvironmental Science.

・Contents

1. History of human society and resource utilization（1st to 3rd classes）
2. Economic development and environmental conservation issues（4th to 6th classes）
3. Background to the establishment of the principle of biodiversity（7th to 9th classes）
4. Development of sustainable management and management（10th to 12th classes）
5. How decentralized traditional resource management system should be（13th to 15th classes）

・Evaluation

Grading will be decided based on class attendance and attitude in class (30%) and final report (70%).

・Notice for Students

NA

Textbook	Designate documents
Reference book	Designate documents
Contact	The office of the instructor is on the 5th floor of the 2nd building. You can contact him anytime via email.

Land Resource Sciences

Registration code	61607	**Credits**	1
Instructor	ISHIKAWA Masaya	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Lecture	**Target research area**	Bioenvironmental Science
How to use English	Handouts only		

・Purpose and Learning Goals

This lecture will try to approach the topics of “creating environments for the efficient production of plants” and “creating environments for sustainable agricultural villages” from the viewpoint of land planning and environmental sciences. Especially, the lecture will explain the mechanisms of environmental stress concerning water pollution caused by agricultural uses. Students will also learn about the development and planning associated with technologies for creating land consolidation work that supports agriculture to conserve the soil and water environment and reduce environmental stress. The lecturer will describe the stages leading up to the completion of his own doctoral research concerning soil physics (identifying a problem, generating hypotheses, collecting data, analyzing the data, presenting results, writing a thesis, and submitting a manuscript for publication) for which he received an international award. He will speak both successes and failures from the viewpoint of writers, reviewers and editors. Students will not only acquire the knowledge from a completed piece of research but also learn the requisite ways of approaching their own research by reliving the processes for completing it.
Upon successful completion of the lecture, students can understand the basic concepts of land resource sciences, as well as obtain basic knowledge about the history of changes of biota and the natural environment from the viewpoint of land planning.

・Course Category (Relations to DP, CP and other courses)

Students can contribute to the society as the skilled engineers and researchers by theoretically considering the natural environment from various aspects and acquiring wide social knowledge and problem-solving ability with a healthy spirit.

・Contents

This course will be divided in 15 chapters as follows:
1. Field development and land consolidation for farmers,
2. Reasonable construction method,
3. Significant of levees, ponding and surface soil,
4. Procedure for land consolidation,
5. Soil conveyance and banking construction,
6. Plow sole, surface soil filling and levee construction,
7. Surface soil leveling and farm roads,
8. Relating and unifying paddy fields and field structure for multi-utilization paddy field,
9. Field structure for compound farming and consolidation of rice terrace,
10. Environmental issues in farmland and earth-friendly agriculture,
11. Benefits of paddy fields in ravines,
12. Water purification in well-constructed field,
13. Aiming to establish sustainable agriculture,
14. New Notation and Equation for Predicting Ammonia Nitrogen Concentrations in Paddy Percolation Water,
15. Adsorption and Movement of Ammonia Nitrogen into Soil Layers with Paddy Percolation Water.
All chapters will rely on the textbook, except 14 and 15 for which notes will be handed out.

・Evaluation

By the end of the course, students should be able to do the following:
・The investigation and the examination for the problem solving can be planned, and the obtained sample should be able to be analyzed,
・The understanding level to the event is deepened through the discussion, and the students should be able to be expressed adequately themselves,
・The research process ability learned by this lecture can be demonstrated,
・The content can be discussed logically.
Grading will be based on attendance (10%), reports (80%), and assessment (10%) of performance in the lab.

・Notice for Students

1. It is important to understand a lot of science articles via self-study.
2. It is important to continue "Intellectual excitement" even after the amount of knowledge increases.
3. Students in the laboratory of land resource sciences have to attend this lecture.

Textbook	Consolidation to sustainable farmland Masaya ISHIKAWA IPB Press
Reference book	NA
Contact	12:00-13:00 of Thursday

Seminar on Land Resource Sciences
(1st year summer semester)

Registration code	61537	**Credits**	2
Instructor	ISHIKAWA Masaya	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioenvironmental Science
How to use English	Full use		

・Purpose and Learning Goals

The aim of this seminar is to help students acquire an understanding of the fundamental principles of land resource sciences and the necessary skills and knowledge needed to achieve a better performance in their master's thesises.
By the end of the course, students should be able to do the following tasks:
・Recognize and recall major terms and concepts in land resource sciences,
・Describe and explain major methods and theories,
・Compare and contrast alternative theories or approaches in terms of their underlying processes.

・Course Category (Relations to DP, CP and other courses)

Students can contribute to the society as the skilled engineers and researchers by theoretically considering the natural environment from various aspects and acquiring wide social knowledge and problem-solving ability with a healthy spirit.

・Contents

Contents:
1. Guidance of seminar:
・How to advance it
2. Practice and deepen:
・Concrete method of advancing research
Class method:
1. The speaker announces the progress report of the research,
2. We discuss it,
3. The class is advanced by not a one-sided class from the instructor but the students' questions and answers and discussion.

・Evaluation

By the end of the course, students should be able to do the following tasks:
・The investigation and the examination for the problem solving can be planned, and the obtained sample should be able to be analyzed,
・The understanding level to the event is deepened through the discussion, and the self should be able to be expressed adequately,
・The research process ability learned by this seminar can be demonstrated,
・The content can be discussed logically.
Grading will be based on attendance (10%), reports (80%), and assessment (10%) of performance in the lab.

・Notice for Students

1. It is important to understand a lot of science articles via self-study.
2. It is important to continue "Intellectual excitement" even after the amount of knowledge increases.
3. Students in the laboratory of land resource sciences have to attend this seminar.

Textbook	NA
Reference book	NA
Contact	12:00-13:00 of Thursday

Seminar on Land Resource Sciences
(1st year winter semester)

Registration code	61538	**Credits**	2
Instructor	ISHIKAWA Masaya	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioenvironmental Science
How to use English	Full use		

・Purpose and Learning Goals

The aim of this seminar is to help students acquire an understanding of the fundamental principles of land resource sciences and the necessary skills and knowledge needed to achieve a better performance in their master's thesises.
By the end of the course, students should be able to do the following tasks:
・Recognize and recall major terms and concepts in land resource sciences,
・Describe and explain major methods and theories,
・Compare and contrast alternative theories or approaches in terms of their underlying processes.

・Course Category (Relations to DP, CP and other courses)

Students can contribute to the society as the skilled engineers and researchers by theoretically considering the natural environment from various aspects and acquiring wide social knowledge and problem-solving ability with a healthy spirit.

・Contents

Contents:
Discussion about concrete method of advancing research and development of consideration
Class method:
1. The speaker announces the progress report of the research,
2. We discuss it,
3. The class is advanced by not a one-sided class from the instructor but the students' questions and answers and discussion.

・Evaluation

By the end of the course, students should be able to do the following tasks:
・The investigation and the examination for the problem solving can be planned, and the obtained sample should be able to be analyzed,
・The understanding level to the event is deepened through the discussion, and the self should be able to be expressed adequately,
・The research process ability learned by this seminar can be demonstrated,
・The content can be discussed logically.
Grading will be based on attendance (10%), reports (80%), and assessment (10%) of performance in the lab.

・Notice for Students

1. It is important to understand a lot of science articles via self-study.
2. It is important to continue "Intellectual excitement" even after the amount of knowledge increases.
3. Students in the laboratory of land resource sciences have to attend this seminar.

Textbook	NA
Reference book	NA
Contact	12:00-13:00 of Thursday

Seminar on Land Resource Sciences
(2nd year summer semester)

Registration code	61654	**Credits**	2
Instructor	ISHIKAWA Masaya	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioenvironmental Science
How to use English	Full use		

・Purpose and Learning Goals

The aim of this seminar is to help students acquire an understanding of the fundamental principles of land resource sciences and the necessary skills and knowledge needed to achieve a better performance in their master's thesises. Upon successful completion of the seminar, students can understand the concepts of land resource sciences, as well as discuss daily data for their researches.

・Course Category (Relations to DP, CP and other courses)

Students can contribute to the society as the skilled engineers and researchers by theoretically considering the natural environment from various aspects and acquiring wide social knowledge and problem-solving ability with a healthy spirit.

・Contents

Contents:
1. Data analysis and discussion:
2. Development of consideration

Class method:
1. The speaker announces the progress report of the research,
2. We discuss it,
3. The class is advanced by not a one-sided class from the instructor but the students' questions and answers and discussion.

・Evaluation

By the end of the course, students should be able to do the following tasks:
・The investigation and the examination for the problem solving can be planned, and the obtained sample should be able to be analyzed,
・The understanding level to the event is deepened through the discussion, and the self should be able to be expressed adequately,
・The research process ability learned by this seminar can be demonstrated,
・The content can be discussed logically.
Grading will be based on attendance (10%), reports (80%), and assessment (10%) of performance in the lab.

・Notice for Students

1. It is important to understand a lot of science articles via self-study.
2. It is important to continue "Intellectual excitement" even after the amount of knowledge increases.
3. Students in the laboratory of land resource sciences have to attend this seminar.

Textbook	NA
Reference book	NA
Contact	12:00-13:00 of Thursday

Seminar on Land Resource Sciences
(2nd year winter semester)

Registration code	61655	**Credits**	2
Instructor	ISHIKAWA Masaya	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioenvironmental Science
How to use English	Full use		

・Purpose and Learning Goals

The aim of this seminar is to help students acquire an understanding of the fundamental principles of land resource sciences and the necessary skills and knowledge needed to achieve a better performance in their master's thesises. Upon successful completion of the seminar, students can finish writing their master's thesises as a current result.

・Course Category (Relations to DP, CP and other courses)

Students can contribute to the society as the skilled engineers and researchers by theoretically considering the natural environment from various aspects and acquiring wide social knowledge and problem-solving ability with a healthy spirit.

・Contents

Contents:
Discussion about concrete method of advancing research and development of consideration
Class method:
1. The speaker announces the progress report of the research,
2. We discuss it,
3. The class is advanced by not a one-sided class from the instructor but the students' questions and answers and discussion.

・Evaluation

By the end of the course, students should be able to do the following tasks:
・The investigation and the examination for the problem solving can be planned, and the obtained sample should be able to be analyzed,
・The understanding level to the event is deepened through the discussion, and the self should be able to be expressed adequately,
・The research process ability learned by this seminar can be demonstrated,
・The content can be discussed logically.
Grading will be based on attendance (10%), reports (80%), and assessment (10%) of performance in the lab.

・Notice for Students

1. It is important to understand a lot of science articles via self-study.
2. It is important to continue "Intellectual excitement" even after the amount of knowledge increases.
3. Students in the laboratory of land resource sciences have to attend this seminar.

Textbook	NA
Reference book	NA
Contact	12:00-13:00 of Thursday

Advanced Course in Ground Disaster Prevention

Registration code	61941	**Credits**	1
Instructor	ZHANG Haizhong	**Coordinator** in case of invited lectures	
Academic year	First	**Semester**	First
Style of course	Lecture	**Target major**	Agricultural Sciences
How to use English	Both English and Japanese		

・Purpose and Learning Goals

[Purpose] In a situation where seismic disasters happen frequently, it is important to understand and predict seismic hazards reasonably. This course aims to provide an understanding of the mechanisms of earthquake occurrence, ground vibration, and landslides, as well as to acquire theoretical knowledge and methods for analyzing them. **[Learning Goals]**
One can explain the overview of ground vibration and landslides caused by earthquakes. [Knowledge/Understanding] One should acquire knowledge and techniques to predict ground vibration and landslide. [Knowledge/Understanding]

・Course Category (Relations to DP, CP and other courses)

This course aims to acquire knowledge and techniques in the area of ground disaster prevention, and it corresponds to the DP of the Agricultural Sciences, "Acquiring advanced knowledge and techniques in each individual field of specialization.

・Contents

[Teaching methods] The course will be conducted face-to-face. In each session, the instructor will give specialized lectures using ppt slides and handouts, followed by discussions with attendees on the content.
[Schedule]
1st session: Mechanism of Earthquake Occurrence
2nd session: Overview of Earthquakes and Ground Disasters
3rd to 5th sessions: Ground Vibration Caused by Earthquakes
6th to 8th sessions: Landslides Caused by Earthquakes

・Evaluation

[Standard] The passing criteria for the course include understanding the objectives outlined in the Learning Goals and acquiring the associated skills.
[Method] The overall evaluation will be based on attendance, participation in discussions, and submitted reports.

・Notice for Students

Taking the undergraduate courses 'Mechanics of Structures' and 'Soil Mechanics' will enhance the understanding of this course.

Textbook	The instructor will distribute materials such as ppt slides and handouts created by the instructor
Reference book	NA
Contact	It is available whenever I am in my office, but please contact me in advance via email or other means. Email:zhang@tds1.tr.yamagata-u.ac.jp

Seminar on Ground Disaster Prevention
（1st year summer semester）

Registration code	61980	**Credits**	2
Instructor	ZHANG Haizhong	**Coordinator** in case of invited lectures	
Academic year	First	**Semester**	First
Style of course	Seminar	**Target major**	Agricultural Sciences
How to use English	Both English and Japanese		

・Purpose and Learning Goals

[Purpose] As preparation for the master's thesis, this course aims to study research papers related to ground disaster prevention, grasp the latest research trends, understand the positioning of one's own research, and become capable of presenting one's own research clearly in presentations.

[Learning Goals] One can collect worldwide literature related to master's thesis research. [Skill]

One can grasp the latest research trends in related fields and explain the positioning of one's own research. [Skill]

・Course Category (Relations to DP, CP and other courses)

This course aims to acquire specialized knowledge, critical thinking skills, and expressive abilities necessary for creating a master's thesis (corresponding to CP3 and DP3 of the agricultural science)

・Contents

[Teaching methods] The course will be conducted face-to-face. Each participant should investigate academic literature related to their research topic, give presentations, and engage in discussions based on them.

[Schedule]

1st session: Introduction

2rd to 14th sessions: Each participant gives presentations related to literature and research about their respective research topics

15th sessions: Conclusions

・Evaluation

[Standard] The passing criteria for the course include understanding the objectives outlined in the Learning Goals and acquiring the associated skills.

[Method] The overall evaluation will be based on attendance, the content and completeness of presentations, and the attitude.

・Notice for Students

It is important for each individual to actively engage with their research topic, addressing issues as they arise and making progress.

Textbook	NA
Reference book	NA
Contact	It is available whenever I am in my office, but please contact me in advance via email or others. Email:zhang@tds1.tr.yamagata-u.ac.jp

Seminar on Ground Disaster Prevention
（1st year winter semester）

Registration code	61981	**Credits**	2
Instructor	ZHANG Haizhong	**Coordinator** in case of invited lectures	
Academic year	First	**Semester**	Second
Style of course	Seminar	**Target major**	Agricultural Sciences
How to use English	Both English and Japanese		

・Purpose and Learning Goals

[Purpose] As preparation for the master's thesis, this course aims to study research papers related to ground disaster prevention, grasp the latest research trends, understand the positioning of one's own research, and become capable of presenting one's own research clearly in presentations.

[Learning Goals] One can collect worldwide literature related to master's thesis research. [Skill]

One can grasp the latest research trends in related fields and explain the positioning of one's own research. [Skill]

・Course Category (Relations to DP, CP and other courses)

This course aims to acquire specialized knowledge, critical thinking skills, and expressive abilities necessary for creating a master's thesis (corresponding to CP3 and DP3 of the agricultural science)

・Contents

[Teaching methods] The course will be conducted face-to-face. Each participant should investigate academic literature related to their research topic, give presentations, and engage in discussions based on them.

[Schedule]

1st session: Introduction

2rd to 14th sessions: Each participant gives presentations related to literature and research about their respective research topics

15th sessions: Conclusions

・Evaluation

[Standard] The passing criteria for the course include understanding the objectives outlined in the Learning Goals and acquiring the associated skills.

[Method] The overall evaluation will be based on attendance, the content and completeness of presentations, and the attitude.

・Notice for Students

It is important for each individual to actively engage with their research topic, addressing issues as they arise and making progress.

Textbook	NA
Reference book	NA
Contact	It is available whenever I am in my office, but please contact me in advance via email or others. Email:zhang@tds1.tr.yamagata-u.ac.jp

Environmental Risk Analysis

Registration code	61610	**Credits**	1
Instructor	WATANABE Toru	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Lecture	**Target research area**	Bioenvironmental Science
How to use English	Full use		

・Purpose and Learning Goals

This course introduces how to think about environmental issues based on probabilistic risk analysis. The goal of this course is to understand concept of and analytical method for environmental risk.

・Course Category (Relations to DP, CP and other courses)

This course contributes to a diploma policy of Department of Agricultural Sciences: Acquiring the advanced knowledge and skills in their academic fields.

・Contents

[Lectures #1 and 2: Concept of environmental risk]
To learn the basic concept of environmental risk, including its history and political demand, and the important matters for your understanding.
[Lectures #3 and #4: Methodology for environmental risk analysis]
To learn how to analyze the environmental risk as well as its scientific theory.
[Lectures #5 to #7: Application of environmental risk analysis]
To learn the past studies applying environmental risk analysis for actual issues.
[Lecture #8: Comprehensive discussion]
To discuss about the environmental risk relevant to the topic of your research based on what you learn in the previous lectures.

・Evaluation

Grading will be decided based on class attendance and attitude in class (20%) and final report (80%).

・Notice for Students

Your active participation in discussion is expected.

Textbook	Handouts will be provided in the classes.
Reference book	D.M. Kammen & D. M. Hassenzahl (eds.) Should we risk it? Exploring Environmental, Health, and Technological Problem Solving, Princeton University Press, 2001.
Contact	The office of TW is on the 5th floor of the 1st building. You can contact him anytime via email (to-ru@tds1.tr.yamagata-u.ac.jp).

Seminar on Environmental Risk Analysis
(1st year summer semester)

Registration code	61543	**Credits**	2
Instructor	WATANABE Toru	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioenvironmental Science
How to use English	Full use		

・Purpose and Learning Goals

The purpose of this course is to help students review the past publications related to their studies. The goal of this course is to be able to discuss about the outcome from the students' studies based on the research trend in the related fields.

・Course Category (Relations to DP, CP and other courses)

This course contributes to a diploma policy of Department of Agricultural Sciences: Acquiring the advanced knowledge and skills in their academic fields.

・Contents

Participants read research articles and review papers on risk analysis or data collection for the analysis. One or few students in each class make the presentations on the articles/papers for discussion with the other participants. The participants should attend all of 15 classess as speakers or audiences.

・Evaluation

Grading will be decided based on your presentation (60%) and attitude in discussion (40%).

・Notice for Students

Your active participation in discussion is expected.

Textbook	Handouts will be provided in the classes.
Reference book	NA
Contact	The office of TW is on the 5th floor of the 1st building. You can contact him anytime via email (to-ru@tds1.tr.yamagata-u.ac.jp).

Seminar on Environmental Risk Analysis
(1st year winter semester)

Registration code	61544	**Credits**	2
Instructor	WATANABE Toru	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioenvironmental Science
How to use English	Full use		

・Purpose and Learning Goals

The purpose of this course is to help students review the past publications related to their studies. The goal of this course is to be able to discuss about the outcome from the students' studies based on the research trend in the related fields.

・Course Category (Relations to DP, CP and other courses)

This course contributes to a diploma policy of Department of Agricultural Sciences: Acquiring the advanced knowledge and skills in their academic fields.

・Contents

Participants read research articles and review papers on risk analysis or data collection for the analysis. One or few students in each class make the presentations on the articles/papers for discussion with the other participants. The participants should attend all of 15 classess as speakers or audiences.

・Evaluation

Students are expected to show their improved performances for presentation and discussion compared with those in the previous course: Seminar on Environmental Risk Analysis
(1st year summer semester). Grading will be decided based on your presentation (60%) and attitude in discussion (40%).

・Notice for Students

Your active participation in discussion is expected.

Textbook	Handouts will be provided in the classes.
Reference book	NA
Contact	The office of TW is on the 5th floor of the 1st building. You can contact him anytime via email (to-ru@tds1.tr.yamagata-u.ac.jp).

Seminar on Environmental Risk Analysis
(2nd year summer semester)

Registration code	61660	**Credits**	2
Instructor	WATANABE Toru	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioenvironmental Science
How to use English	Full use		

・Purpose and Learning Goals

The purpose of this course is to help students review the past publications related to their studies. The goal of this course is to be able to discuss about the outcome from the students' studies based on the research trend in the related fields.

・Course Category (Relations to DP, CP and other courses)

This course contributes to a diploma policy of Department of Agricultural Sciences: Acquiring the advanced knowledge and skills in their academic fields.

・Contents

Participants read research articles and review papers on risk analysis or data collection for the analysis. One or few students in each class make the presentations on the articles/papers for discussion with the other participants. The participants should attend all of 15 classess as speakers or audiences.

・Evaluation

Students are expected to show their improved performances for presentation and discussion compared with those in the previous course: Seminar on Environmental Risk Analysis
(1st year winter semester). Grading will be decided based on your presentation (60%) and attitude in discussion (40%).

・Notice for Students

Your active participation in discussion is expected.

Textbook	Handouts will be provided in the classes.
Reference book	NA
Contact	The office of TW is on the 5th floor of the 1st building. You can contact him anytime via email (to-ru@tds1.tr.yamagata-u.ac.jp).

Seminar on Environmental Risk Analysis
(2nd year winter semester)

Registration code	61661	**Credits**	2
Instructor	WATANABE Toru	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioenvironmental Science
How to use English	Full use		

・Purpose and Learning Goals

The purpose of this course is to help students review the past publications related to their studies. The goal of this course is to be able to discuss about the outcome fromthe students' studies based on the research trend in the related fields.

・Course Category (Relations to DP, CP and other courses)

This course contributes to a diploma policy of Department of Agricultural Sciences: Acquiring the advanced knowledge and skills in their academic fields.

・Contents

Participants read research articles and review papers on risk analysis or data collection for the analysis. One or few students in each class make the presentations on the articles/papers for discussion with the other participants. The participants should attend all of 15 classess as speakers or audiences.

・Evaluation

Students are expected to show their improved performances for presentation and discussion compared with those in the previous course: Seminar on Environmental Risk Analysis
(2nd year summer semester). Grading will be decided based on your presentation (60%) and attitude in discussion (40%).

・Notice for Students

Your active participation in discussion is expected.

Textbook	Handouts will be provided in the classes.
Reference book	NA
Contact	The office of TW is on the 5th floor of the 1st building. You can contact him anytime via email (to-ru@tds1.tr.yamagata-u.ac.jp).

Environmental Hydraulic Engineering

Registration code	61604	**Credits**	1
Instructor	WATANABE Kazuya	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Lecture	**Target research area**	Bioenvironmental Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

This course deals with the floods and disaster prevention facilities in Japan and the fundamental of applied ecology and civil engineering research to students taking this course.

・Course Category (Relations to DP, CP and other courses)

This course is to obtain "the capacity to perform planning of survey and experiment, implementation, data analysis and discussion for solution of problems" in the diploma policy of Deparment of Bioenvironmental Science.

・Contents

Basics on Stream
Restoration (What is Restoration?)
An Alternative solution
Salmonid lifecycles and life histories
Physical Components of Stream Microhabitat
Hydraulic Engineering
Discussion on Environmental Hydraulic Engineering

・Evaluation

Grading will be decided based on class attendance and attitude in class (40%) and final report (60%).

・Notice for Students

Your active participation in discussion is expected.

Textbook	Handouts will be provided in the classes.
Reference book	Ann L. Riley, Restoring Streams in Cities, Island Press,1998. Christopher J. Hunter, Better Trout Habitat, Island Press, 1991.
Contact	The office of KW is on the 2nd floor of the 2nd building. You can contact me anytime via email (kwatanabe@tds1.tr.yamagata-u.ac.jp).

Seminar on Environmental Hydraulic Engineering
(1st year summer semester)

Registration code	61531	**Credits**	2
Instructor	WATANABE Kazuya	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioenvironmental Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The purpose of this course is to help students review the past publications related to their studies. The goal of this course is to be able to discuss about the outcome from the students' studies based on the research trends in the related fields.

・Course Category (Relations to DP, CP and other courses)

This course is to obtain "the capacity to perform planning of survey and experiment, implementation, data analysis and discussion for solution of problems" in the diploma policy of Deparment of Bioenvironmental Science.

・Contents

Participants read research articles and review papers on Environmental Hydraulic Engineering or data collection for the analysis. One or few students in each class make the presentations on the articles/papers for discussion with the other participants. The participants should attend all of 15 classess as speakers or audiences.

・Evaluation

Grading will be decided based on your presentation (60%) and attitude in discussion (40%).

・Notice for Students

Your active participation in discussion is expected.

Textbook	Handouts will be provided in the classes.
Reference book	NA
Contact	The office of KW is on the 2nd floor of the 2nd building. You can contact me anytime via email (kwatanabe@tds1.tr.yamagata-u.ac.jp).

Seminar on Environmental Hydraulic Engineering
(1st year winter semester)

Registration code	61532	**Credits**	2
Instructor	WATANABE Kazuya	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioenvironmental Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The purpose of this course is to help students review the past publications related to their studies. The goal of this course is to be able to discuss about the outcome from the students' studies based on the research trends in the related fields.

・Course Category (Relations to DP, CP and other courses)

This course is to obtain "the capacity to perform planning of survey and experiment, implementation, data analysis and discussion for solution of problems" in the diploma policy of Deparment of Bioenvironmental Science.

・Contents

Participants read research articles and review papers on Environmental Hydraulic Engineering or data collection for the analysis. One or few students in each class make the presentations on the articles/papers for discussion with the other participants. The participants should attend all of 15 classess as speakers or audiences.

・Evaluation

Grading will be decided based on your presentation (60%) and attitude in discussion (40%).

・Notice for Students

Your active participation in discussion is expected.

Textbook	Handouts will be provided in the classes.
Reference book	NA
Contact	The office of KW is on the 2nd floor of the 2nd building. You can contact me anytime via email (kwatanabe@tds1.tr.yamagata-u.ac.jp).

Seminar on Environmental Hydraulic Engineering
(2nd year summer semester)

Registration code	61648	**Credits**	2
Instructor	WATANABE Kazuya	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target research area**	Bioenvironmental Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The purpose of this course is to help students review the past publications related to their studies. The goal of this course is to be able to discuss about the outcome from the students' studies based on the research trends in the related fields.

・Course Category (Relations to DP, CP and other courses)

This course is to obtain "the capacity to perform planning of survey and experiment, implementation, data analysis and discussion for solution of problems" in the diploma policy of Deparment of Bioenvironmental Science.

・Contents

Participants read research articles and review papers on Environmental Hydraulic Engineering or data collection for the analysis. One or few students in each class make the presentations on the articles/papers for discussion with the other participants. The participants should attend all of 15 classess as speakers or audiences.

・Evaluation

Grading will be decided based on your presentation (60%) and attitude in discussion (40%).

・Notice for Students

Your active participation in discussion is expected.

Textbook	Handouts will be provided in the classes.
Reference book	NA
Contact	The office of KW is on the 2nd floor of the 2nd building. You can contact me anytime via email (kwatanabe@tds1.tr.yamagata-u.ac.jp).

Seminar on Environmental Hydraulic Engineering
(2nd year winter semester)

Registration code	61649	**Credits**	2
Instructor	WATANABE Kazuya	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target research area**	Bioenvironmental Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The purpose of this course is to help students review the past publications related to their studies. The goal of this course is to be able to discuss about the outcome from the students' studies based on the research trends in the related fields.

・Course Category (Relations to DP, CP and other courses)

This course is to obtain "the capacity to perform planning of survey and experiment, implementation, data analysis and discussion for solution of problems" in the diploma policy of Deparment of Bioenvironmental Science.

・Contents

Participants read research articles and review papers on Environmental Hydraulic Engineering or data collection for the analysis. One or few students in each class make the presentations on the articles/papers for discussion with the other participants. The participants should attend all of 15 classess as speakers or audiences.

・Evaluation

Grading will be decided based on your presentation (60%) and attitude in discussion (40%).

・Notice for Students

Your active participation in discussion is expected.

Textbook	Handouts will be provided in the classes.
Reference book	NA
Contact	The office of KW is on the 2nd floor of the 2nd building. You can contact me anytime via email (kwatanabe@tds1.tr.yamagata-u.ac.jp).

Seminar on forest and sociology
(1st year summer semester)

Registration code	61697	**Credits**	2
Instructor	HAYASHI Masahide	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	summer
Style of course	Seminar	**Target research area**	Bioenvironmental Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The purpose of this course is to help students review the past publications related to his/her study. The goal of this course is to be able to discuss about the outcome from his/her study based on the research trend in the related field.

・Course Category (Relations to DP, CP and other courses)

This course is to obtain DP(1) in Department of Bioenvironmental Science

・Contents

Participants read research articles and review papers on the institutional analysis of forest governance or data collection for the analysis. One or few students in each class make the presentations on the articles/papers for discussion with the other participants. The participants should attend all of 15 classess as speaker or audience.

・Evaluation

Grading will be decided based on your presentation (60%) and attitude in discussion (40%).

・Notice for Students

Your active participation in discussion is expected.

Textbook	NA
Reference book	NA
Contact	hayashima@tds1.tr.yamagata-u.ac.jp

Seminar on forest and sociology
(1st year winter semester)

Registration code	61698	**Credits**	2
Instructor	HAYASHI Masahide	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	winter
Style of course	Seminar	**Target research area**	Bioenvironmental Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The purpose of this course is to help students review the past publications related to his/her study. The goal of this course is to be able to discuss about the outcome from his/her study based on the research trend in the related field.

・Course Category (Relations to DP, CP and other courses)

This course is to obtain DP(1) in Department of Bioenvironmental Science

・Contents

Participants read research articles and review papers on the institutional analysis of forest governance or data collection for the analysis. One or few students in each class make the presentations on the articles/papers for discussion with the other participants. The participants should attend all of 15 classess as speaker or audience.

・Evaluation

Grading will be decided based on your presentation (60%) and attitude in discussion (40%).

・Notice for Students

Your active participation in discussion is expected.

Textbook	NA
Reference book	NA
Contact	hayashima@tds1.tr.yamagata-u.ac.jp

Seminar on forest and sociology
(2nd year summer semester)

Registration code	61699	**Credits**	2
Instructor	HAYASHI Masahide	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	summer
Style of course	Seminar	**Target research area**	Bioenvironmental Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The purpose of this course is to help students review the past publications related to his/her study. The goal of this course is to be able to discuss about the outcome from his/her study based on the research trend in the related field.

・Course Category (Relations to DP, CP and other courses)

This course is to obtain DP(1) in Department of Bioenvironmental Science

・Contents

Participants read research articles and review papers on the institutional analysis of forest governance or data collection for the analysis. One or few students in each class make the presentations on the articles/papers for discussion with the other participants. The participants should attend all of 15 classess as speaker or audience.

・Evaluation

Grading will be decided based on your presentation (60%) and attitude in discussion (40%).

・Notice for Students

Your active participation in discussion is expected.

Textbook	NA
Reference book	NA
Contact	hayashima@tds1.tr.yamagata-u.ac.jp

Seminar on forest and sociology
(2nd year winter semester)

Registration code	61700	**Credits**	2
Instructor	HAYASHI Masahide	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	winter
Style of course	Seminar	**Target research area**	Bioenvironmental Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The purpose of this course is to help students review the past publications related to his/her study. The goal of this course is to be able to discuss about the outcome from his/her study based on the research trend in the related field.

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Textbook	NA
Reference book	NA
Contact	hayashima@tds1.tr.yamagata-u.ac.jp