List of 2020 Syllabus

■Common Graduate School Courses

Registration Code	Courses	Credits	Instructor
61004	International Understanding (Foreign Seminar)	1	
61005	Intensive Scientific Communication Course in English	1	TAWARAYA Keitaro *1
61011	Academic Skills: Scientific Presentations + Writing	1	Karolin Jiptner

*1 Coordinator

■Bioproduction Science

Registration Code	Courses	Credits	Instructor
61101	Special Lecture on Bioproduction Science (1st year summer semester)	2	Professors in Department of Bioproduction Science
61102	Special Lecture on Bioproduction Science (1st year winter semester)	2	
61103	Special Seminar on Bioproduction Science (1st year winter semester)	2	
61165	Special Seminar on Bioproduction Science (2nd year summer semester)	2	
61113	Seminar on Advanced Pomology (1st year summer semester)	1	TAIRA Satoshi, IKEDA Kazuo, MATSUMOTO Daiki
61114	Seminar on Advanced Pomology (1st year winter semester)	1	
61132	Advanced Pomology	2	
61176	Seminar on Advanced Pomology (2nd year summer semester)	1	
61177	Seminar on Advanced Pomology (2nd year winter semester)	1	
61115	Seminar on Vegetable Physiology (1st year summer semester)	1	NISHIZAWA Takashi
61116	Seminar on Vegetable Physiology (1st year winter semester)	1	
61133	Vegetable Physiology	2	
61178	Seminar on Vegetable Physiology (2nd year summer semester)	1	
61179	Seminar on Vegetable Physiology (2nd year winter semester)	1	
61119	Seminar on Plant Pathology (1st year summer semester)	1	HASE Shu, KOBAYASHI Takashi
61120	Seminar on Plant Pathology (1st year winter semester)	1	
61135	Advanced Plant Pathology	2	
61182	Seminar on Plant Pathology (2nd year summer semester)	1	
61183	Seminar on Plant Pathology (2nd year winter semester)	1	
61121	Seminar on Animal Ecology (1st year summer semester)	1	SATO Satoru
61122	Seminar on Animal Ecology (1st year winter semester)	1	
61136	Animal Ecology	2	
61184	Seminar on Animal Ecology (2nd year summer semester)	1	
61185	Seminar on Animal Ecology (2nd year winter semester)	1	
61137	Edaphology	2	KAKUDA Ken-ichi, SASAKI Yuka
61123	Seminar on Edaphology (1st year summer semester)	1	
61124	Seminar on Edaphology (1st year winter semester)	1	
61186	Seminar on Edaphology (2nd year summer semester)	1	
61187	Seminar on Edaphology (2nd year winter semester)	1	
61210	Agricultural Geography	2	WATANABE Rie
61144	Seminar on Farm Business Management (1st year summer semester)	1	CHEN, AoFei
61145	Seminar on Farm Business Management (1st year winter semester)	1	
61158	Advanced Farm Business Management	2	
61196	Seminar on Farm Business Management (2nd year summer semester)	1	
61197	Seminar on Farm Business Management (2nd year winter semester)	1	
61150	Seminar on Sociology of Food, Agriculture, and Environment (1st year summer semester)	1	HOKIMOTO Toshiyuki
61151	Seminar on Sociology of Food, Agriculture, and Environment (1st year winter semester)	1	
61161	Sociology of Food, Agriculture, and Environment	2	
61202	Seminar on Sociology of Food, Agriculture, and Environment (2nd year summer semester)	1	
61203	Seminar on Sociology of Food, Agriculture, and Environment (2nd year winter semester)	1	
61216	Seminar on Food and Agriculture Education (1st year summer semester)	1	OMORI Katsura
61217	Seminar on Food and Agriculture Education (1st year winter semester)	1	
61218	Seminar on Food and Agriculture Education (2nd year summer semester)	1	
61219	Seminar on Food and Agriculture Education (2nd year winter semester)	1	
61221	Food and Agriculture Education	2	

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■Bioresource Science

Registration Code	Courses	Credits	Instructor
61364	Special Seminar on Bioresource Science	2	Professors in Department of Bioresource Science
61309	Seminar on Molecular Animal Reproduction and Development (1st year summer semester)	2	KIKMURA Naoko
61310	Seminar on Molecular Animal Reproduction and Development (1st year winter semester)	2	
61373	Seminar on Molecular Animal Reproduction and Development (2nd year summer semester)	2	
61374	Seminar on Molecular Animal Reproduction and Development (2nd year winter semester)	2	
61317	Seminar on Biomass Resources Science (1st year summer semester)	2	WATANABE Masanori
61318	Seminar on Biomass Resources Science (1st year winter semester)	2	
61330	Biomass Resources Science	2	
61381	Seminar on Biomass Resources Science (2nd year summer semester)	2	
61382	Seminar on Biomass Resources Science (2nd year winter semester)	2	
61328	Bioresources Chemistry	2	SHIONO Yoshihito
61313	Seminar on Bioresources Chemistry (1st year summer semester)	2	
61314	Seminar on Bioresources Chemistry (1st year winter semester)	2	
61377	Seminar on Bioresources Chemistry (2nd year summer semester)	2	
61378	Seminar on Bioresources Chemistry (2nd year winter semester)	2	
61336	Seminar on Plant Genetics and Genomics (1st year summer semester)	2	SASANUMA Tsuneo
61337	Seminar on Plant Genetics and Genomics (1st year winter semester)	2	
61355	Plant Genetics and Genomics	2	
61391	Seminar on Plant Genetics and Genomics (2nd year summer semester)	2	
61392	Seminar on Plant Genetics and Genomics (2nd year winter semester)	2	
61338	Seminar on Postharvest Physiology (1st year summer semester)	2	MURAYAMA Hideki
61339	Seminar on Postharvest Physiology (1st year winter semester)	2	
61356	Postharvest Physiology	2	
61393	Seminar on Postharvest Physiology (2nd year summer semester)	2	
61394	Seminar on Postharvest Physiology (2nd year winter semester)	2	
61340	Seminar on Applied Metabolomics (1st year summer semester)	2	OIKAWA Akira
61341	Seminar on Applied Metabolomics (1st year winter semester)	2	
61357	Applied Metabolomics	2	
61424	Seminar on Metabolic Biochemistry (2nd year summer semester)	2	
61425	Seminar on Metabolic Biochemistry (2nd year winter semester)	2	
61344	Seminar on Plant Nutrition (1st year summer semester)	2	TAWARAYA Keitaro
61345	Seminar on Plant Nutrition (1st year winter semester)	2	
61359	Plant Nutriiton	2	
61399	Seminar on Plant Nutrition (2nd year summer semester)	2	
61400	Seminar on Plant Nutrition (2nd year winter semester)	2	
61346	Seminar on Soil Bioresource Science (1st year summer semester)	2	CHENG, Weiguo
61347	Seminar on Soil Bioresource Science (1st year winter semester)	2	
61360	Soil Bioresources Science	2	
61401	Seminar on Soil Bioresource Science (2nd year summer semester)	2	
61402	Seminar on Soil Bioresource Science (2nd year winter semester)	2	
61362	Bioorganic Chemistry	2	ABOSHI Takako
61416	Seminar on Nutritional Physiology (1st year summer semester)	2	SUZUKI Takuji
61417	Seminar on Nutritional Physiology (1st year winter semester)	2	
61418	Seminar on Nutritional Physiology (2nd year summer semester)	2	
61419	Seminar on Nutritional Physiology (2nd year winter semester)	2	

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■Bioenvironmental Science

Registration Code	Courses	Credits	Instructor
61501	Special Lecture on Science of Bioenvironmental Science	2	Professors in Department of Bioenvironmental Science
61502	Special Seminar on Science of Bioenvironmental Science (1st year summer semester)	1	
61619	Special Seminar on Science of Bioenvironmental Science (2nd year summer semester)	1	
61515	Seminar on Resources Economics (1st year summer semester)	2	OGAWA Sanshiro
61516	Seminar on Resources Economics (1st year winter semester)	2	
61557	Technical Seminar on Resources Economics (1st year summer semester)	1	
61558	Technical Seminar on Resources Economics (1st year winter semester)	1	
61596	Resources Economics	2	
61632	Seminar on Resources Economics (2nd year summer semester)	2	
61633	Seminar on Resources Economics (2nd year winter semester)	2	
61519	Seminar on Forest Influences (1st year summer semester)	2	KIKUCHI Syunichi
61520	Seminar on Forest Influences (1st year winter semester)	2	
61598	Forest Disturbances and Conservation	2	
61636	Seminar on Forest Influences (2nd year summer semester)	2	
61637	Seminar on Forest Influences (2nd year winter semester)	2	
61525	Seminar on Forest Conservation and Management (1st year summer semester)	2	HAYASHIDA Mitsuhiro
61526	Seminar on Forest Conservation and Management (1st year winter semester)	2	
61567	Technical Seminar on Biodiversity (1st year summer semester)	1	
61568	Technical Seminar on Biodiversity (1st year winter semester)	1	
61601	Forest Conservation and Management	2	
61642	Seminar on Forest Conservation and Management (2nd year summer semester)	2	
61643	Seminar on Forest Conservation and Management (2nd year winter semester)	2	
61529	Seminar on Forest Snow and Ice Science (1st year summer semester)	2	Lopez Caceres Maximo Larry
61530	Seminar on Forest Snow and Ice Science (1st year winter semester)	2	
61573	Technical Seminar on Forest Snow and Ice Science (1st year summer semester)	1	
61574	Technical Seminar on Forest Snow and Ice Science (1st year winter semester)	1	
61603	Forest Snow and Ice Science	2	
61646	Seminar on Forest Snow and Ice Science (2nd year summer semester)	2	
61647	Seminar on Forest Snow and Ice Science (2nd year winter semester)	2	
61531	Seminar on Environmental Hydraulic Engineering (1st year summer semester)	2	WATANABE Kazuya
61532	Seminar on Environmental Hydraulic Engineering (1st year winter semester)	2	
61575	Technical Seminar on Environmental Hydraulic Engineering (1st year summer semester)	1	
61576	Technical Seminar on Environmental Hydraulic Engineering (1st year winter semester)	1	
61604	Environmental Hydraulic Engineering	2	
61648	Seminar on Environmental Hydraulic Engineering (2nd year summer semester)	2	
61649	Seminar on Environmental Hydraulic Engineering (2nd year winter semester)	2	
61537	Seminar on Land Resource Sciences (1st year summer semester)	2	ISHIKAWA Masaya
61538	Seminar on Land Resource Sciences (1st year winter semester)	2	
61607	Land Resource Sciences	2	
61654	Seminar on Land Resource Sciences (2nd year summer semester)	2	
61655	Seminar on Land Resource Sciences (2nd year winter semester)	2	
61543	Seminar on Environmental Risk Analysis (1st year summer semester)	2	WATANABE Toru
61544	Seminar on Environmental Risk Analysis (1st year winter semester)	2	
61587	Technical Seminar on Environmental Risk Analysis (1st year summer semester)	1	
61588	Technical Seminar on Environmental Risk Analysis (1st year winter semester)	1	
61660	Seminar on Environmental Risk Analysis (2nd year summer semester)	2	
61661	Seminar on Environmental Risk Analysis (2nd year winter semester)	2	
61610	Environmental Risk Analysis	2	
61555	Techinical Seminar on Institutional Analysis of Forest Government (1st year summer semester)	1	HAYASHI Masahide
61556	Techinical Seminar on Institutional Analysis of Forest Government (1st year winter semester)	1	
61595	Institutional Analysis of Forest Government	2	

Intensive Scientific Communication Course in English

Intensive Scientific Communication Course in English

担当教員:Martin ROBERT
担当教員の所属:非常勤講師

開講学年:1年,2年　開講学期:通年　単位数:1単位　開講形態:演習
開講対象:　科目区分:

【授業の目的】
Introduction to Effective Scientific Communication

【授業の到達目標】
* To provide students with the essentials for effectively communicating scientific information both in oral and written form using English.

* To practice and develop the basic skills for communicating research「知識・理解」

【授業概要(キーワード)】
Scientific communication, scientific writing, research presentation, communication skills, posters, conference, seminars

【科目の位置付け】
To learn skill of scientific communication in English(農学部食料生命環境学科のカリキュラムポリシー)

【授業計画】
・授業の方法
・Introduction to major tasks, themes, and issues in scientific communication
・In class practice and exercises such as preparing title/abstract, poster, and oral presentation
・日程
Course contents
・Hints and Tips on writing in a clear and concise manner ・The Do's and Don'ts of scientific writing ・Crafting a good title and a good abstract ・Poster preparation and presentation ・Oral presentation of research findings ・Other relevant topics
3 X 5 hours intensive-course (over three days). Between 10:30-12:30 and 13:30-17:00 each day
Day1:
Guidance and Introduction to scientific communication. Introduction to scientific writing: Hints and Tips on writing in a clear and concise manner. The Do's and Don'ts of scientific writing. Crafting a good title and a good abstract (in class exercise) and discussion. Preparing a good scientific poster
Day 2:
Student poster presentations and evaluations. Basics about oral presentation of research findings. Other topics, Q&A
Day 3:
Student oral presentations. More about writing and making good visuals. Other topics, summary, Q&A, discussion.

【学習の方法】
・受講のあり方
study content of handout and note. To understand content of slide and talk during lecture.
・授業時間外学習へのアドバイス
To study content of handout and note. To understand content of slide and talk during lecture.

【成績の評価】
・基準
Students will be evaluated based on active in-class participation (25%) and completion of exercises and assignments
・方法
Abstract/title writing (25%), Poster preparation and presentation (25%), Oral presentation (25%)

【テキスト・参考書】
Online resource:
Doumont, J., ed. English Communication for Scientists. Cambridge, MA: NPG Education, 2010.
http://www.nature.com/scitable/ebooks/english-communication-for-scientists-14053993

Books
1) Writing Papers in the Biological Sciences by Victoria E. McMillan Bedford/St. Martin's (2001) ISBN 0-312-25857-7.
2) A Short Guide to Writing about Biology, A (5th Edition) by Jan A. Pechenik. Pearson Longman (2004) ISBN 0-321ー15981-0.
3) Scientific Writing: A Reader and Writer's Guide. Lebrun, J., World Scientific Publishing Company (2007) ISBN9812701443
4) When the Scientist Presents (An Audio and Video Guide to Science Talks), by Lebrun, J., World Scientific Publishing Company (2010). ISBN 978-981-283-920-6
5) Science Research Writing For Non-native Speakers Of English, by Hilary Glasman-Deal, World Scientific Publishing Company (2009). ISBN 978-1-84816-310-2

Journal articles
1) Bourne, P.E. Ten Simple Rules for Making Good Oral Presentations. PLoS Comput Biol 3, e77 (2007).
2) Erren, T.C. & Bourne, P.E. Ten Simple Rules for a Good Poster Presentation. PLoS Comput Biol 3, e102 (2007).
3) Bourne, P.E. Ten Simple Rules for Getting Published. PLoS Comput Biol 1, e57 (2005).

【その他】
・学生へのメッセージ
Scientific communication is necessary for students of natural science and important for oral presentation and poster presentation in the international conference.
・オフィス・アワー
Students can contact lecturer during course. Students ask lecturer by sending e-mail.

67000051-2019-16-61005

Academic Skills: Scientific Presentations + Writing

Academic Skills: Scientific Presentations + Writing

担当教員:Karolin Jiptner(イプトナー カロリン)
担当教員の所属:大学院理工学研究科(工学系)学部共通分野
開講学年:1年　開講学期:後期　単位数:1単位　開講形態:講義
開講対象:　科目区分:

【授業の目的】
In “Academic Skills: Scientific Presentations + Writing,” we will learn how to use English effectively in academic writing and academic presentations.

【授業の到達目標】
The goal of this class is for you to learn how to give academic presentations and to acquire smart writing techniques.

【授業概要(キーワード)】
Scientific English, Academic Presentations, Scientific Writing

【科目の位置付け】

【授業計画】
・授業の方法
Classes will be taught in lecture style with some practical/group activities. The class will be held partly in English and partly in Japanese.
・日程
This course will teach the usage of English in academic presentations and academic writing. The course will focus on English phrases as well as smart presentation techniques. Examples of such are meaningful comparisons, figures, and labels. The course will be divided into lecture-type lessons and practical sessions/discussions.
The class is scheduled to take place every two weeks.

【学習の方法】
・受講のあり方
You are expected to actively participate in class each week and to complete every assignment.
・授業時間外学習へのアドバイス
Carefully complete assignments and prepare for every class to make the course most useful for your scientific future.

【成績の評価】
・基準
Your grade will be evaluated based on class participation, assignment completion, and a final report/presentation.
・方法
Grades will be calculated in the following fashion:
Assignments: 30 pts.
Class participation: 30 pts.
Final report/presentation: 40 pts.

【テキスト・参考書】
No textbooks are required for this class.

【その他】
・学生へのメッセージ
English learning can be fun! If you really want to improve your English skills, you should try using it in your daily life: watch movies in English, read books in English, or just try to talk to your friends in English. You can also join the English activities at the Faculty of Engineering International Center such as Daily English Conversation, Movie Night, and Board Game Night.
・オフィス・アワー
Every Friday 13:00 - 15:00 or by appointment.

Special Lecture on Bioproduction Science
(1st year summer semester)

Registration code	61101	**Credits**	2
Instructor	Professors in Department of Bioproduction Science	**Coordinator** in case of invited lecture	NA
Academic year	1st year	**Semester**	Summer
Style of course	Lecture	**Target program**	Bioproduction Science
How to use English	Only for handouts		

・Purpose and Learning Goals

The aim of this course is to help students acquire an understanding of domain and recent research topics in bioproduction science. At the end of the course, participants are expected to understand the basic contents of their own research field and also other fields.

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

This course enhances the development of student's skill in clarifying the problems and proposing the effective solutions in bioproduction.

・Contents

Lectures on recent trends of research in the following fields are delivered:
1.Crop science,
2. Pomology,
3. Vegetable science,
4. Ornamental horticulture,
5. Plant pathology,
6. Animal ecology,
7. Edaphology,
8. animal science and technology,
9. Agricultural machinery,
10. Economics of food, agriculture and environment,
11. Farm business management,
12. Policy of food, agriculture and environment,
13. Environment accounting for food and agriculture,
14. Sociology of food, agriculture and environment,
15. Geography of food, agriculture and environment,
16. Public nutrition,
17. Food education

・Evaluation

Your final grade will be calculated according to the following process in each class: Usual performance score 50%, Level of understanding (including the report) 50%. Participation in more than 2/3 classes will be needed.

・Notice for Students

This course is obligatory, so it is recommended to attend all classes and be on time. We highly recommend to take note on lectures and study in details in the relevant literature.

Textbook	Will be introduced in the class.
Reference book	
Contact	Please refer the office hour of each lecturer.

Special Lecture on Bioproduction Science
(1st year winter semester)

Registration code	61102	**Credits**	2
Instructor	Professors in Department of Bioproduction Science	**Coordinator** in case of invited lecture	NA
Academic year	1st year	**Semester**	Winter
Style of course	Lecture	**Target program**	Bioproduction Science
How to use English	Only for handouts		

・Purpose and Learning Goals

The aim of this course is to help students acquire an understanding of domain and recent research topics in bioproduction science. At the end of the course, participants are expected to understand the basic contents of their own research field and also other fields.

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

This course enhances the development of student's skill in clarifying the problems and proposing the effective solutions in bioproduction.

・Contents

Lectures on recent trends of research in the following fields are delivered:
1.Crop science,
2. Pomology,
3. Vegetable science,
4. Ornamental horticulture,
5. Plant pathology,
6. Animal ecology,
7. Edaphology,
8. animal science and technology,
9. Agricultural machinery,
10. Economics of food, agriculture and environment,
11. Farm business management,
12. Policy of food, agriculture and environment,
13. Environment accounting for food and agriculture,
14. Sociology of food, agriculture and environment,
15. Geography of food, agriculture and environment,
16. Public nutrition,
17. Food education

・Evaluation

Your final grade will be calculated according to the following process in each class: Usual performance score 50%, Level of understanding (including the report) 50%. Participation in more than 2/3 classes will be needed.

・Notice for Students

This course is obligatory, so it is recommended to attend all classes and be on time. We highly recommend to take note on lectures and study in details in the relevant literature.

Textbook	Will be introduced in the class.
Reference book	
Contact	Please refer the office hour of each lecturer.

Special Seminar on Bioproduction Science
(1st year winter semester)

Registration code	61103	**Credits**	2
Instructor	Professors in Department of Bioproduction Science	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target program**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

This course enhances the development of students' ability of self thinking and learning and their skills in making oral presentation.

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

The aim of this course is to help students acquire the necessary skills to understand the knowledge in research field and make effective oral presentation.

・Contents

At first, each student selects a paper of international journals which is related to his/her master thesis and introduces its outline and essence in tum every class. After that, participants will have a discussion about it.

・Evaluation

Your final grade will be calculated according to the following process in each class: Usual performance score 30%, Evaluation of presentation 70%. Participation in more than 2/3 classes will be needed.

・Notice for Students

This course is obligatory, so it is recommended to attend all classes and be on time. We highly recommend to take note on lectures and study in details in the relevant literature.

Textbook	
Reference book	
Contact	Please refer the office hour of each lecturer.

Special Seminar on Bioproduction Science
(2nd year summer semester)

Registration code	61165	**Credits**	2
Instructor	Professors in Department of Bioproduction Science	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

This course enhances the development of students' ability of self thinking and learning and their skills in making oral presentation.

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

The aim of this course is to help students acquire the necessary skills to understand the knowledge in research field and make effective oral presentation.

・Contents

At first, each student selects a paper of international journals which is related to his/her master thesis and introduces its outline and essence in tum every class. After that, participants will have a discussion about it.

・Evaluation

Your final grade will be calculated according to the following process in each class: Usual performance score 30%, Evaluation of presentation 70%. Participation in more than 2/3 classes will be needed.

・Notice for Students

This course is obligatory, so it is recommended to attend all classes and be on time. We highly recommend to take note on lectures and study in details in the relevant literature.

Textbook	
Reference book	
Contact	Please refer the office hour of each lecturer.

Seminar on Advanced Pomology
(1st year summer semester)

Registration code	61113	**Credits**	2
Instructor	TAIRA Satoshi, IKEDA Kazuo, MATSUMOTO Daiki	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioproduction Science
How to use English	Only for handouts		

・Purpose and Learning Goals

The purpose of this course is to comprehend significant studies on production and utilization of deciduous fruit trees systematically.
The learning goals are to acquire the literacy to review the studies on pomology as a researcher, and to have an opinion on challenges of the fields related to pomology based on the expertise.

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

This course cultivates the presentation skills and expertise in pomology and academic researches, which are required for graduation work.

・Contents

This class is conducted through the discussion on the scientific papers written in English related to the following topics.
Three or four papers will be selected for each topic.

Topic 1: Physiology of flowering and fruit set
Topic 2: Physiology of fruit development and maturation
Topic 3: Postharvest physiology and quality of fruits
Topic 4: Breeding of fruit trees and evaluation of genetic resources

・Evaluation

Students' understanding levels of the topics and the papers and their opinions are evaluated.
Evaluation are conducted through presentation and active participation in discussion.

・Notice for Students

The papers selected will present advanced works.
Students' attempts are required to comprehend them.

Textbook	Nothing
Reference book	Nothing
Contact	16:10～17:00 on Tuesday (TAIRA Satoshi), as needed (IKEDA Kazuo), 16:00～17:00 on Monday (MATSUMOTO Daiki)

Seminar on Advanced Pomology
(1st year winter semester)

Registration code	61114	**Credits**	1
Instructor	TAIRA Satoshi, IKEDA Kazuo, MATSUMOTO Daiki	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target program**	Bioproduction Science
How to use English	Only for handouts		

・Purpose and Learning Goals

The purpose of this course is to comprehend significant studies on production and utilization of deciduous fruit trees systematically.
The learning goals are to acquire the literacy to review the studies on pomology as a researcher, and to have an opinion on challenges of the fields related to pomology based on the expertise.

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

This course cultivates the presentation skills and expertise in pomology and academic researches, which are required for graduation work.

・Contents

This class is conducted through the discussion on the scientific papers written in English related to the following topics.
Three or four papers will be selected for each topic.

Topic 1: Physiology of flowering and fruit set
Topic 2: Physiology of fruit development and maturation
Topic 3: Postharvest physiology and quality of fruits
Topic 4: Breeding of fruit trees and evaluation of genetic resources

・Evaluation

Students' understanding levels of the topics and the papers and their opinions are evaluated.
Evaluation are conducted through presentation and active participation in discussion.

・Notice for Students

The papers selected will present advanced works.
Students' attempts are required to comprehend them.

Textbook	Nothing
Reference book	Nothing
Contact	16:10～17:00 on Tuesday (TAIRA Satoshi), as needed (IKEDA Kazuo), 16:00～17:00 on Monday (MATSUMOTO Daiki)

Advanced Pomology

Registration code	61132	**Credits**	2
Instructor	TAIRA Satoshi, IKEDA Kazuo, MATSUMOTO Daiki	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Lecture	**Target program**	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: Fruit development and management of sweet cherry
Topic 2: Management and utilizaton of wild grape.
Topic 3: Elucidation of astringency removal and long-storage of persimmon
Topic 4: Actuals and issues on the breeding of fruit trees
Topic 5: Self-incompatibility of the fruit trees
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	Nothing
Reference book	Nothing
Contact	16：10～17：00 on Tuesday (TAIRA Satoshi), as needed (IKEDA Kazuo), 16：00～17：00 on Monday (MATSUMOTO Daiki)

Seminar on Advanced Pomology
(2nd year summer semester)

Registration code	61176	**Credits**	1
Instructor	TAIRA Satoshi, IKEDA Kazuo, MATSUMOTO Daiki	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioproduction Science
How to use English	Only for handouts		

・Purpose and Learning Goals

The purpose of this course is to comprehend significant studies on production and utilization of deciduous fruit trees systematically.
The learning goals are to acquire the literacy to review the studies on pomology as a researcher, and to have an opinion on challenges of the fields related to pomology based on the expertise.

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

This course cultivates the presentation skills and expertise in pomology and academic researches, which are required for graduation work.

・Contents

This class is conducted through the discussion on the scientific papers written in English related to the following topics.
Three or four papers will be selected for each topic.

Topic 1: Physiology of flowering and fruit set
Topic 2: Physiology of fruit development and maturation
Topic 3: Postharvest physiology and quality of fruits
Topic 4: Breeding of fruit trees and evaluation of genetic resources

・Evaluation

Students' understanding levels of the topics and the papers and their opinions are evaluated.
Evaluation are conducted through presentation and active participation in discussion.

・Notice for Students

The papers selected will present advanced works.
Students' attempts are required to comprehend them.

Textbook	Nothing
Reference book	Nothing
Contact	16:10～17:00 on Tuesday (TAIRA Satoshi), as needed (IKEDA Kazuo), 16:00～17:00 on Monday (MATSUMOTO Daiki)

Seminar on Advanced Pomology
(2nd year winter semester)

Registration code	61177	**Credits**	1
Instructor	TAIRA Satoshi, IKEDA Kazuo, MATSUMOTO Daiki	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target program**	Bioproduction Science
How to use English	Only for handouts		

・Purpose and Learning Goals

The purpose of this course is to comprehend significant studies on production and utilization of deciduous fruit trees systematically.
The learning goals are to acquire the literacy to review the studies on pomology as a researcher, and to have an opinion on challenges of the fields related to pomology based on the expertise.

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

This course cultivates the presentation skills and expertise in pomology and academic researches, which are required for graduation work.

・Contents

This class is conducted through the discussion on the scientific papers written in English related to the following topics.
Three or four papers will be selected for each topic.

Topic 1: Physiology of flowering and fruit set
Topic 2: Physiology of fruit development and maturation
Topic 3: Postharvest physiology and quality of fruits
Topic 4: Breeding of fruit trees and evaluation of genetic resources

・Evaluation

Students' understanding levels of the topics and the papers and their opinions are evaluated.
Evaluation are conducted through presentation and active participation in discussion.

・Notice for Students

The papers selected will present advanced works.
Students' attempts are required to comprehend them.

Textbook	Nothing
Reference book	Nothing
Contact	16:10～17:00 on Tuesday (TAIRA Satoshi), as needed (IKEDA Kazuo), 16:00～17:00 on Monday (MATSUMOTO Daiki)

Seminar on Vegetable Physiology
(1st year summer semester)

Registration code	61115	**Credits**	1
Instructor	NISHIZAWA Takashi	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioproduction Science
How to use English	Full use		

・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	None
Reference book	None
Contact	Tue

Seminar on Vegetable Physiology
(1st year winter semester)

Registration code	61116	**Credits**	1
Instructor	NISHIZAWA Takashi	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target program**	Bioproduction Science
How to use English	Full use		

・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	None
Reference book	None
Contact	Tue

Vegetable Physiology

Registration code	61133	**Credits**	2
Instructor	NISHIZAWA Takashi	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Lecture	**Target program**	Bioproduction Science
How to use English	Full use		

・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	None
Reference book	T. Higashide (2013). Tomatoes : cultivation, varieties and nutrition. Nova Publishers
Contact	Tue

Seminar on Vegetable Physiology
(2nd year summer semester)

Registration code	61178	**Credits**	1
Instructor	NISHIZAWA Takashi	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioproduction Science
How to use English	Full use		

・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	None
Reference book	None
Contact	Tue

Seminar on Vegetable Physiology
(2nd year winter semester)

Registration code	61179	**Credits**	1
Instructor	NISHIZAWA Takashi	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target program**	Bioproduction Science
How to use English	Full use		

・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	None
Reference book	None
Contact	Tue

Seminar on Plant Pathology
(1st year summer semester)

Registration code	61119	**Credits**	1
Instructor	HASE Shu, KOBAYASHI Takashi	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target program**	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	
Contact	anytime

Seminar on Plant Pathology
(1st year winter semester)

Registration code	61120	**Credits**	1
Instructor	HASE Shu, KOBAYASHI Takashi	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target program**	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	
Contact	anytime

Advanced Plant Pathology

Registration code	61135	**Credits**	2
Instructor	HASE Shu, KOBAYASHI Takashi	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Lecture	**Target program**	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
2: Other rice diseases
3:Forecasting of rice diseases
4: pest magegement
5: Plant protection act
6: Agricultural Chemicals Control Law
7: Topics 1
Lectures delivered by HASE Shu
8: Microorganism - interaction between plants (fungi)
9: Microbial - plant interaction (bacteria)
10: Microbial - plant interaction (virus)
11: Biological control (fungal diseases)
12: Biological Control (Bacterial Disease)
13th: Biological control (virus disease)
14: Biological control study in other countries
15: 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	no text
Reference book	Plant Pathology 5th ed (Agrios 2005)
Contact	anytime

Seminar on Plant Pathology
(2nd year summer semester)

Registration code	61182	**Credits**	1
Instructor	HASE Shu, KOBAYASHI Takashi	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target program**	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	
Contact	anytime

Seminar on Plant Pathology
(2nd year winter semester)

Registration code	61183	**Credits**	1
Instructor	HASE Shu, KOBAYASHI Takashi	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target program**	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	
Contact	anytime

Seminar on Animal Ecology
(1st year summer semester)

Registration code	61121	**Credits**	1
Instructor	SATO Satoru	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target program**	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**	1
Instructor	SATO Satoru	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target program**	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**	2
Instructor	SATO Satoru	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Lecture	**Target program**	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.

Seminar on Animal Ecology
(2nd year summer semester)

Registration code	61184	**Credits**	1
Instructor	SATO Satoru	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target program**	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	61185	**Credits**	1
Instructor	SATO Satoru	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target program**	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.

Edaphology

Registration code	61137	**Credits**	2
Instructor	KAKUDA Ken-ichi, SASAKI Yuka	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Lecture	**Target program**	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	
Reference book	
Contact	

Seminar on Edaphology
(1st year summer semester)

Registration code	61123	**Credits**	1
Instructor	KAKUDA Ken-ichi, SASAKI Yuka	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target program**	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 use~~d~~ 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	
Reference book	
Contact	

Seminar on Edaphology
(1st year winter semester)

Registration code	61124	**Credits**	1
Instructor	KAKUDA Ken-ichi, SASAKI Yuka	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target program**	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 use~~d~~ 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	
Reference book	
Contact	

Seminar on Edaphology
(2nd year summer semester)

Registration code	61186	**Credits**	1
Instructor	KAKUDA Ken-ichi, SASAKI Yuka	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target program**	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	
Reference book	
Contact	

Seminar on Edaphology
(2nd year winter semester)

Registration code	61187	**Credits**	1
Instructor	KAKUDA Ken-ichi, SASAKI Yuka	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target program**	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	
Reference book	
Contact	

Agricultural Geography

Registration code	61210	**Credits**	2
Instructor	WATANABE Rie	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioproduction Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

This course deals with the basis of Human 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 Human 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 Human Geography?
2. History of the theme of Human 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)

Seminar on Farm Business Management
(1st year summer semester)

Registration code	61144	**Credits**	1
Instructor	SUMITA Tsuyoshi	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioproduction Science
How to use English	Full use		

・Purpose and Learning Goals

This course deals with the new theory of farm business management. It also enhances the development of students' skills in research by making oral presentations and discussions. The goals of this course are (1) to understand the practical decision-making in farm management under the various circumstances and (2) to discuss the judgement the quality of decision-making.

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

The aim of this course is to help students acquire the necessary skills to achieve the creativity and identify in order to solve the food problems of Japan and the world from the view point of farm management.

・Contents

1. Organization of farm management, 2. Incorporation of community farming, 2. Human resource management in community farming, 4. Land arrangement of community farming, 5. Product marketing business of community farming, 6. Food processing business of community farming, 7. Tourism business of community farming, 8. Regional contribution of community business, 9. ICT and community business, 10. Succession and retirement, 11. Contribution of aged farmers, 12. Contribution of female farmers, 13. relation between community farming and individual farm, 14. Environmental protection and community farming, 15. Review

・Evaluation

Your Final Grade will be calculated according to the following process: Usual performance score 20%, Reports 80%.

・Notice for Students

We highly recommend to prepare each lecture by reading the text book and deepen understanding of business management by bibliographic survey.

Textbook	Will be introduced in the class.
Reference book	
Contact	sumita@tr.yamagata-u.ac.jp

Seminar on Farm Business Management
(1st year winter semester)

Registration code	61145	**Credits**	1
Instructor	SUMITA Tsuyoshi	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target program**	Bioproduction Science
How to use English	Full use		

・Purpose and Learning Goals

This course deals with the new theory of farm business management. It also enhances the development of students' skills in research by making oral presentations and discussions. The goals of this course are (1) to understand the practical decision-making in farm management under the various circumstances and (2) to discuss the judgement the quality of decision-making.

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

The aim of this course is to help students acquire the necessary skills to achieve the creativity and identify in order to solve the food problems of Japan and the world from the view point of farm management.

・Contents

1. Organization of farm management, 2. Incorporation of community farming, 2. Human resource management in community farming, 4. Land arrangement of community farming, 5. Product marketing business of community farming, 6. Food processing business of community farming, 7. Tourism business of community farming, 8. Regional contribution of community business, 9. ICT and community business, 10. Succession and retirement, 11. Contribution of aged farmers, 12. Contribution of female farmers, 13. relation between community farming and individual farm, 14. Environmental protection and community farming, 15. Review

・Evaluation

Your Final Grade will be calculated according to the following process: Usual performance score 20%, Reports 80%.

・Notice for Students

We highly recommend to prepare each lecture by reading the text book and deepen understanding of business management by bibliographic survey.

Textbook	Will be introduced in the class.
Reference book	
Contact	sumita@tr.yamagata-u.ac.jp

Advanced Farm Business Management

Registration code	61158	**Credits**	2
Instructor	SUMITA Tsuyoshi	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Lecture	**Target program**	Bioproduction Science
How to use English	Full use		

・Purpose and Learning Goals

This course introduces the new theory of farm business management and enhances the development of student's research capability. The goals of this course are : (1) to understand the decision-making in farm management under the various circumstances and (2) to discuss the estimation of decision-making.

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

The aim of this course is to help students acquire the necessary skills to achieve the creativity and identify in order to solve the food problems of Japan and the world from the view point of farm management.

・Contents

Contents: 1. The Scope of Farm Management, 2. Strategic Management, 3. Marketing Plan, 4. Budgeting, 5. Production and Operating Management, 6. Quality Management and Control, 7. Financial Analysis, 8. Financial Management, 9. Investment Analysis, 10. Land Purchase and Rental, 11. Risk Management, Production Contract Evaluation, 13. Staffing and Organization, 14. The Future Farm Management, 15. Review

・Evaluation

Your Final Grade will be calculated according to the following process: Usual performance score 20%, Reports 80%.

・Notice for Students

We highly recommend students to prepare each lecture by reading the text book and deepen understanding of business management by bibliographic survey.

Textbook	Farm Management, Principles and Strategic, Kent D. Olson, Iowa State Press
Reference book	
Contact	sumita@tr.yamagata-u.ac.jp

Seminar on Farm Business Management
(2nd year summer semester)

Registration code	61196	**Credits**	1
Instructor	SUMITA Tsuyoshi	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioproduction Science
How to use English	Full use		

・Purpose and Learning Goals

This course deals with the new theory of farm business management. It also enhances the development of students' skills in research by making oral presentations and discussions. The goals of this course are (1) to understand the practical decision-making in farm management under the various circumstances and (2) to discuss the judgement the quality of decision-making.

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

The aim of this course is to help students acquire the necessary skills to achieve the creativity and identify in order to solve the food problems of Japan and the world from the view point of farm management.

・Contents

1. Organization of farm management, 2. Incorporation of community farming, 2. Human resource management in community farming, 4. Land arrangement of community farming, 5. Product marketing business of community farming, 6. Food processing business of community farming, 7. Tourism business of community farming, 8. Regional contribution of community business, 9. ICT and community business, 10. Succession and retirement, 11. Contribution of aged farmers, 12. Contribution of female farmers, 13. relation between community farming and individual farm, 14. Environmental protection and community farming, 15. Review

・Evaluation

Your Final Grade will be calculated according to the following process: Usual performance score 20%, Reports 80%.

・Notice for Students

We highly recommend to prepare each lecture by reading the text book and deepen understanding of business management by bibliographic survey.

Textbook	Will be introduced in the class.
Reference book	
Contact	sumita@tr.yamagata-u.ac.jp

Seminar on Farm Business Management
(2nd year winter semester)

Registration code	61197	**Credits**	1
Instructor	SUMITA Tsuyoshi	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target program**	Bioproduction Science
How to use English	Full use		

・Purpose and Learning Goals

This course deals with the new theory of farm business management. It also enhances the development of students' skills in research by making oral presentations and discussions. The goals of this course are (1) to understand the practical decision-making in farm management under the various circumstances and (2) to discuss the judgement the quality of decision-making.

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

The aim of this course is to help students acquire the necessary skills to achieve the creativity and identify in order to solve the food problems of Japan and the world from the view point of farm management.

・Contents

1. Organization of farm management, 2. Incorporation of community farming, 2. Human resource management in community farming, 4. Land arrangement of community farming, 5. Product marketing business of community farming, 6. Food processing business of community farming, 7. Tourism business of community farming, 8. Regional contribution of community business, 9. ICT and community business, 10. Succession and retirement, 11. Contribution of aged farmers, 12. Contribution of female farmers, 13. relation between community farming and individual farm, 14. Environmental protection and community farming, 15. Review

・Evaluation

Your Final Grade will be calculated according to the following process: Usual performance score 20%, Reports 80%.

・Notice for Students

We highly recommend to prepare each lecture by reading the text book and deepen understanding of business management by bibliographic survey.

Textbook	Will be introduced in the class.
Reference book	
Contact	sumita@tr.yamagata-u.ac.jp

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

Registration code	61150	**Credits**	1
Instructor	HOKIMOTO Toshiyuki	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target program**	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**	1
Instructor	HOKIMOTO Toshiyuki	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target program**	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**	2
Instructor	HOKIMOTO Toshiyuki	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Lecture	**Target program**	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 Sociology of Food, Agriculture, and Environment
(2nd year summer semester)

Registration code	61202	**Credits**	1
Instructor	HOKIMOTO Toshiyuki	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target program**	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	61203	**Credits**	1
Instructor	HOKIMOTO Toshiyuki	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target program**	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 Food and Agriculture Education
(1st year summer semester)

Registration code	61216	**Credits**	1
Instructor	OMORI Katsura	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioproduction Science
How to use English	Japanese is the main language in class, but English is also often used to interpret Japanese technical words especially when the students cannot understand.		

・Purpose and Learning Goals

The purpose of this course is to help students understand the meanings of education about food and agriculture in our society.
The learning goal is to understand the current situation and progressive models of food and agriculture education in order to create effective learning methods about food and agriculture.

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

This course is set for students to understand the roles of education about food and agriculture from various perspectives as well as to obtain specialized knowledge and skills necessary for implementing effective education about food and agriculture in the diploma policy (4).

・Contents

The students read research papers on each of the following topics and make a presentation in turn. After that, we discuss about what we find and learn from the presentation.
Lesson 1: Orientation
Lesson 2-3: The topics are the history and current situation of our diets, issues and problems.
Lesson 4-5: The topics are trends and tasks of education about food and agriculture at school.
Lesson 6-7: The topics are the current situation and issues on agriculture in Japan.
Lesson 8-11: The topics are good models of education about food and agriculture in Japan.
Lesson 12-14: The topics are good models of education about food and agriculture outside Japan.
Lesson 15: Overview

・Evaluation

Grading will be decided based on your presentation (60%) and your attendance to the discussion in each class (40%).

・Notice for Students

You are expected to positively participate in the discussion and thoroughly prepare for your own presentation.

Textbook	Some recommended academic journals will be introduced in class.
Reference book	
Contact	The office is located in the 1st building of Faculty of Education, Arts and Science at Kojirakawa campus. You can send me an email anytime (omorik@e.yamagata-u.ac.jp).

Seminar on Food and Agriculture Education
(1st year winter semester)

Registration code	61217	**Credits**	1
Instructor	OMORI Katsura	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target program**	Bioproduction Science
How to use English	Japanese is the main language in class, but English is also often used to interpret Japanese technical words especially when the students cannot understand.		

・Purpose and Learning Goals

The purpose of this course is to help students develop appropriate methods for education about food and agriculture.
The learning goals are 1) to create the actual materials to teach about food and agriculture and 2) to understand the significant points for the teacher.

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

This course is set for students to understand the roles of education about food and agriculture from various perspectives as well as to obtain specialized knowledge and skills necessary for implementing effective education about food and agriculture in the diploma policy (4).

・Contents

In the first half of the course, the students will learn significant points necessary for planning education about food and agriculture. In the last half, the students will be divided into some groups to create the actual lesson plans and teaching materials about food and nutrition. Each group practices their own plan in turn and they are assessed by the other groups in class.

・Evaluation

Grading will be decided based on your presentation (60%) and your attendance to the discussion in each class (40%).

・Notice for Students

You are expected to positively participate in the discussion and thoroughly prepare for your own presentation.

Textbook	Some recommended academic journals will be introduced in class.
Reference book	
Contact	The office is located in the 1st building of Faculty of Education, Arts and Science at Kojirakawa campus. You can send me an email anytime (omorik@e.yamagata-u.ac.jp).

Seminar on Food and Agriculture Education
(2nd year summer semester)

Registration code	61218	**Credits**	1
Instructor	OMORI Katsura	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioproduction Science
How to use English	Japanese is the main language in class, but English is also often used to interpret Japanese technical words especially when the students cannot understand.		

・Purpose and Learning Goals

The purpose of this course is to help students understand the meanings of education about food and agriculture in our society.
The learning goal is to understand the current situation and progressive models of food and agriculture education in order to develop effective learning methods about food and agriculture.

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

This course is set for students to understand the roles of education about food and agriculture from various perspectives as well as to obtain specialized knowledge and skills necessary for implementing effective education about food and agriculture in the diploma policy (4).

・Contents

The students read research papers on each topics as follows, and make a presentation in turn. We discuss about what we find and learn from the presentation.
Lesson 1: Orientation
Lesson 2-3: The topics are the history and current situation of our diets, issues and problems.
Lesson 4-5: The topics are trends and tasks of education about food and agriculture at school.
Lesson 6-7: The topics are the current situation and issues on agriculture in Japan.
Lesson 8-11: The topics are good models of education about food and agriculture in Japan.
Lesson 12-14: The topics are good models of education about food and agriculture outside Japan.
Lesson 15: Overview

・Evaluation

Grading will be decided based on your presentation (60%) and your attendance to the discussion in each class (40%).

・Notice for Students

You are expected to positively participate in the discussion and prepare for the good quality of your own presentation.

Textbook	Some recommended academic journals will be introduced in class.
Reference book	
Contact	The office is located in the 1st building of Faculty of Education, Arts and Science at Kojirakawa campus. You can send me an email anytime (omorik@e.yamagata-u.ac.jp).

Seminar on Food and Agriculture Education
(2nd year winter semester)

Registration code	61219	**Credits**	1
Instructor	OMORI Katsura	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target program**	Bioproduction Science
How to use English	Japanese is the main language in class, but English is also often used to interpret Japanese technical words especially when the students cannot understand.		

・Purpose and Learning Goals

The purpose of this course is to help students develop appropriate methods for education about food and agriculture.
The learning goals are 1) to develop the effective materials to teach about food and agriculture and 2) to understand the appropriate circumstances for better learning.

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

This course is set for students to understand the roles of educaion about food and agriculture from various perspectives as well as to obtain specialized knowledge and skills necessary for implementing effecitve education about food and agricutlture in the diploma policy (4).

・Contents

In the first half of the course, the students will learn significant points necessary for planning education about food and agriculture. In the last half, the students will be divided into some groups to develop the good lesson plans and teaching materials about food and nutrition. Each group practices their own plan in turn and they are assessed by the other groups in class.

・Evaluation

Grading will be decided based on your presentation (60%) and your attendance to the discussion in each class (40%).

・Notice for Students

You are expected to perform the positive participation ~~to~~ in the discussion and well preparation for your own presentation.

Textbook	Some recommended academic journals will be introduced in class.
Reference book	
Contact	The office is located in the 1st building of Faculty of Education, Arts and Science at Kojirakawa campus. You can send me an email anytime (omorik@e.yamagata-u.ac.jp).

Food and Agriculture Education

Registration code	61221	**Credits**	2
Instructor	OMORI Katsura	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Lecture	**Target program**	Bioproduction Science
How to use English	Japanese is the main language in class, but English is also often used to interpret Japanese technical words especially when the students cannot understand.		

・Purpose and Learning Goals

The purpose of this course is to provide students specialized knowledge about food and agricultural education which encourages people to understand the relationship between agriculture and our daily life.
The goal of this course 1) to explain about the significant meaning and roles of education about food and agriculture from various perspectives and, 2) to create the appropriate contents and teaching materials necessary for effective learning about food and agriculture.

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

This course is set for students to understand the roles of education about food and agriculture from various perspectives as well as to obtain specialized knowledge necessary for implementing effective education about food and agriculture in the diploma policy (4).

・Contents

Lesson 1: Orientation
Lesson 2-6: Background and history of education about food and agriculture
Lesson 7-10: Food and agriculture education at school, community, and overseas
Lesson 11-14: Presenatation and discussion (good models inside and outside of Japan)
Lesson 15: Review

・Evaluation

Grading will be decided based on class attendance (25%), reports (50%) and tests (25%).

・Notice for Students

Your positive participation in class is significant. You are also expected to solve your questions and develop what you learn, by yourself after the class.

Textbook	Handouts will be provided in classes.
Reference book	
Contact	The office is located in the 1st building of Faculty of Education, Arts and Science at Kojirakawa campus. You can send me an email anytime (omorik@e.yamagata-u.ac.jp).

Special Seminar on Bioresource Science

Registration code	61364	**Credits**	2
Instructor	Professors on Department of Bioresource Science	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioresource Science
How to use English	English and/or Japanese		

・Purpose and Learning Goals

The aim of this seminar is to conduct mid-term report of a master's thesis. The goals of this seminar are to (1) grasp the progress of research objectively and (2) promote the level of the research.

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

The category is to grasp the progress of a master's thesis and to ~~e~~clarify future direction of the research.

・Contents

The mid-term report of a master's thesis is conducted during summer of the 2nd year.

・Evaluation

Grading will be decided based on presentation matter attitude, and answers for questions about mid-term report of a master's thesis and its future research program.

・Notice for Students

Students should discuss their master's thesis researches with the main regent professors. Students should consider reffering to the advise from the main regent professors and related literatures of their thesis.

Textbook	
Reference book	
Contact	

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

Seminar on Biomass Resources Science
(1st year summer semester)

Registration code	61317	**Credits**	2
Instructor	WATANABE Masanori	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioresource Science
How to use English	This course will be taught in Japanese and English.		

・Purpose and Learning Goals

The purpose of this course is to help students review the past publications related to their studies.
The goals of this course are:
- to be able to explain/understand the technical terms, basic technology and experimental methods related to biomass utilization.
- to be able to construct the research scheme and experimental methods.
- to be able to generally discuss about logical constitution of research themes.

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

The biological resources such as microoganisms, animals, plants and their living environments are the study objects in the program, and various advanced techniques are adopted to develop and improve bioresource utilization and specialized field of study. Moreover, the course aim to solve various problems in the local society and the international community.

・Contents

Participants read research articles and review papers on biomass utilization. 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 based on quality of presentation and contribution for discussion.

・Notice for Students

We highly recommend students to participate the active discussion.

Textbook	Handouts will be provided in the classes.
Reference book	not available
Contact	Every Monday, 12:00-13:00, room 3454 or 3407 (Third building, forth floor)

Seminar on Biomass Resources Science
(1st year winter semester)

Registration code	61318	**Credits**	2
Instructor	WATANABE Masanori	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target program**	Bioresource Science
How to use English	This course will be taught in Japanese and English.		

・Purpose and Learning Goals

The purpose of this course is to help students review the past publications related to their studies.
The goals of this course are:
- to be able to explain/understand the technical terms, basic technology and experimental methods related to biomass utilization.
- to be able to construct the research scheme and experimental methods.
- to be able to generally discuss about logical constitution of research themes.

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

The biological resources such as microoganisms, animals, plants and their living environments are the study objects in the program, and various advanced techniques are adopted to develop and improve bioresource utilization and specialized field of study. Moreover, the course aim to solve various problems in the local society and the international community.

・Contents

Participants read research articles and review papers on biomass utilization. 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 based on quality of presentation and contribution for discussion.

・Notice for Students

We highly recommend students to participate the active discussion.

Textbook	Handouts will be provided in the classes.
Reference book	not available
Contact	Every Monday, 12:00-13:00, room 3454 or 3407 (Third building, forth floor)

Biomass Resources Science

Registration code	61330	**Credits**	2
Instructor	WATANABE Masanori	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Lecture	**Target program**	Bioresource Science
How to use English	This course will be taught in Japanese and English.		

・Purpose and Learning Goals

The purpose of this course is to help students review the past publications related to ~~his/her~~ their studies. The goals of this course are:
- to be able to explain/understand the concept of "Bio-refinery".
- to be able to learn/accumulate the knowledge of latest biomass utilization technology in and outside Japan,
- to be able to discuss about the methodology of biomass utilization and appropriate technology based on research ethics in science and technology.

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

The biological resources such as microoganisms, animals, plants and their living environments are the study objects in the program, and various advanced techniques are adopted to develop and improve bioresource utilization and specialized field of study. Moreover, the course is to solve various problems in the local society and the international community.

・Contents

1st to 5th classes: Lectures on practical biomass utilization.
6th to 7th classes: Lectures on energy production from biomass.
8th to 10th classes: Lectures on technology of physico-chemical ~~treatement~~ treatment of biomass.
11th & 13th classes: Lectures on technology of microbial treatement of biomass.
14th class: Lectures on legal system concerning biomass utilization.
15th class: Discussion on biomass utilization.

・Evaluation

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

・Notice for Students

We highly recommend students to participate in the active discussion regarding biomass utilization.

Textbook	Handouts will be provided in the classes.
Reference book	not available
Contact	Every Monday, 12:00-13:00, room 3454 or 3407 (Third building, forth floor)

Seminar on Biomass Resources Science
(2nd year summer semester)

Registration code	61381	**Credits**	2
Instructor	WATANABE Masanori	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioresource Science
How to use English	This course will be taught in Japanese and English.		

・Purpose and Learning Goals

The purpose of this course is to help students review the past publications related to their studies.
The goals of this course are:
- to be able to explain/understand the technical terms, basic technology and experimental methods related to biomass utilization.
- to be able to construct the research scheme and experimental methods.
- to be able to generally discuss about logical constitution of research themes.

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

The biological resources such as microoganisms, animals, plants and their living environments are the study objects in the program, and various advanced techniques are adopted to develop and improve bioresource utilization and specialized field of study. Moreover, the course aim to solve various problems in the local society and the international community.

・Contents

Participants read research articles and review papers on biomass utilization. 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 based on quality of presentation and contribution for discussion.

・Notice for Students

We highly recommend students to participate the active discussion.

Textbook	Handouts will be provided in the classes.
Reference book	not available
Contact	Every Monday, 12:00-13:00, room 3454 or 3407 (Third building, forth floor)

Seminar on Biomass Resources Science
(2nd year winter semester)

Registration code	61382	**Credits**	2
Instructor	WATANABE Masanori	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target program**	Bioresource Science
How to use English	This course will be taught in Japanese and English.		

・Purpose and Learning Goals

The purpose of this course is to help students review the past publications related to their studies.
The goals of this course are:
- to be able to explain/understand the technical terms, basic technology and experimental methods related to biomass utilization.
- to be able to construct the research scheme and experimental methods.
- to be able to generally discuss about logical constitution of research themes.

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

The biological resources such as microoganisms, animals, plants and their living environments are the study objects in the program, and various advanced techniques are adopted to develop and improve bioresource utilization and specialized field of study. Moreover, the course aim to solve various problems in the local society and the international community.

・Contents

Participants read research articles and review papers on biomass utilization. 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 based on quality of presentation and contribution for discussion.

・Notice for Students

We highly recommend students to participate the active discussion.

Textbook	Handouts will be provided in the classes.
Reference book	not available
Contact	Every Monday, 12:00-13:00, room 3454 or 3407 (Third building, forth floor)

Bioresources Chemistry

Registration code	61328	**Credits**	2
Instructor	SHIONO Yoshihito	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioresource Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

To learn about the activity of novel substances, their structure, chemical structure analysis method, biosynthetic pathway, using literature on the latest natural bioactive substances.

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

This seminar is intended for students who are able to solve a wide range of expertise related to biological resource studies and subjects in the diploma policy of Deparment of Bioresource Engineering.

・Contents

1st to 5th : Isolation of natural organic compounds
6th to 10th : Separation and purification of natural organic compounds
11th to 15th : Biosynthetic pathway of natural organic compounds

・Evaluation

Grades for the subject will be based on the understanding in discussion.

・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

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 program**	Bioresource Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

1) To learn how to separate and purify natural biologically active substances from fungi and plants.
2) To aim at learning the latest method on the structure analysis and determination of biologically active substances.
3) To consider the biosynthetic pathway of natural compounds and the method of biological activity test.

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

This seminar is intended for students who are able to solve a wide range of expertise related to biological resource studies and subjects in the diploma policy of Deparment of Bioresource Engineering.

・Contents

Discussion about advanced research examples according to the presentation.

・Evaluation

Contents of your presentation and the level of comprehension by question-and-answer.

・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 program**	Bioresource Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

1) To learn how to separate and purify natural biologically active substances from fungi and plants.
2) To aim at learning the latest method on the structure analysis and determination of biologically active substances.
3) To consider the biosynthetic pathway of natural compounds and the method of biological activity test.

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

This seminar is intended for students who are able to solve a wide range of expertise related to biological resource studies and subjects in the diploma policy of Deparment of Bioresource Engineering.

・Contents

Discussion about advanced research examples according to the presentation.

・Evaluation

Contents of your presentation and the level of comprehension by question-and-answer.

・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 program**	Bioresource Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

1) To learn how to separate and purify natural biologically active substances from fungi and plants.
2) To aim at learning the latest method on the structure analysis and determination of biologically active substances.
3) To consider the biosynthetic pathway of natural compounds and the method of biological activity test.

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

This seminar is intended for students who are able to solve a wide range of expertise related to biological resource studies and subjects in the diploma policy of Deparment of Bioresource Engineering.

・Contents

Discussion about advanced research examples according to the presentation.

・Evaluation

Contents of your presentation and the level of comprehension by question-and-answer.

・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 program**	Bioresource Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

1) To learn how to separate and purify natural biologically active substances from fungi and plants.
2) To aim at learning the latest method on the structure analysis and determination of biologically active substances.
3) To consider the biosynthetic pathway of natural compounds and the method of biological activity test.

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

This seminar is intended for students who are able to solve a wide range of expertise related to biological resource studies and subjects in the diploma policy of Deparment of Bioresource Engineering.

・Contents

Discussion about advanced research examples according to the presentation.

・Evaluation

Contents of your presentation and the level of comprehension by question-and-answer.

・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 Plant Genetics and Genomics
(1st year summer semester)

Registration code	61336	**Credits**	2
Instructor	SASANUMA Tsuneo	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioresource Science
How to use English	Depends on students		

・Purpose and Learning Goals

This course introduces various studies in plant ganetics and genomics covering comprehensive field from basic cytological to recent molecular researches. The goal of this seminar is to acquire knowledge enough to elucidate the plant genetics and genomics and apply it to students' own researches.

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

This course is to obtaine "the capacity to perform planning of survey and experiment, implementation, data analysis and discussion for the solution of the problems" in the DP in Department of Bioresource Science.

・Contents

This seminar will be held as presentation by participating students. In each class, one or two student(s) will introduce a research article and participants will have a discussion on the topic. The articles to be introduced will be chosen by students. Examples of the recomended topics are shown as below.

1. Studies on plant genome and polypoidy based on classical, cytologial and molecular genetics.
2. Diversity analyses on genetic resources.
3. Applied studies of plant genomics and genetics to breeding.

・Evaluation

Grading will be decided based on presentation and attitude in discussion.

・Notice for Students

Your active participation in discussion is expected.

Textbook	Handouts will be provided in the classes.
Reference book	References will be introduced in the classes.
Contact	The office of Tsuneo Sasanuma is on the 4th floor of the 3rd building. You can contact him via email (sasanuma@tds1.tr.yamagata-u.ac.jp)

Seminar on Plant Genetics and Genomics
(1st year winter semester)

Registration code	61337	**Credits**	2
Instructor	SASANUMA Tsuneo	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target program**	Bioresource Science
How to use English	Depends on students		

・Purpose and Learning Goals

This course introduces various studies in plant ganetics and genomics covering comprehensive field from basic cytological to recent molecular researches. The goal of this seminar is to acquire knowledge enough to elucidate the plant genetics and genomics and apply it to students' own researches.

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

This course is to obtaine "the capacity to perform planning of survey and experiment, implementation, data analysis and discussion for the solution of the problems" in the DP in Department of Bioresource Science.

・Contents

This seminar will be held as presentation by participating students. In each class, one or two student(s) will introduce a research article and participants will have a discussion on the topic. The articles to be introduced will be chosen by students. Examples of the recomended topics are shown as below.
1. Studies on plant genome and polypoidy based on classical, cytologial and molecular genetics.
2. Diversity analyses on genetic resources.
3. Applied studies of plant genomics and genetics to breeding.

・Evaluation

Grading will be decided based on presentation and attitude in discussion.

・Notice for Students

Your active participation in discussion is expected.

Textbook	Handouts will be provided in the classes.
Reference book	References will be introduced in the classes.
Contact	The office of Tsuneo Sasanuma is on the 4th floor of the 3rd building. You can contact him via email (sasanuma@tds1.tr.yamagata-u.ac.jp)

Plant Genetics and Genomics

Registration code	61355	**Credits**	2
Instructor	SASANUMA Tsuneo	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Year-round
Style of course	Lecture	**Target program**	Bioresource Science
How to use English	Depends on students		

・Purpose and Learning Goals

This course introduces elucidation of the genome. Genome is a term classically defined as a set of chromosomes essential to survive for a species. This definition is proposed by Dr. Hitoshi Kihara based on his extentive reseach on wheat polyploidy. The goal of this course is to be able to understand what the genome is and how the genome analysis have been conducted.

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

This course is to obtain~~e~~ "the capacity to perform planning of survey and experiment, implementation, data analysis and discussion for the solution of the problems" in the DP in Department of Bioresource Science.

・Contents

1st topic: Lectures on the definition of the genome.
2nd topic: Lectures on genome analysis of wheat and its polyploidy.
3rd topic: Lectures on application of wheat genetics and genomics.

・Evaluation

Grading will be decided based on final report.

・Notice for Students

Your active participation in discussion is expected.

Textbook	Handouts will be provided in the classes.
Reference book	References will be introduced in the classes.
Contact	The office of Tsuneo Sasanuma is on the 4th floor of the 3rd building. You can contact him via email (sasanuma@tds1.tr.yamagata-u.ac.jp)

Seminar on Plant Genetics and Genomics
(2nd year summer semester)

Registration code	61391	**Credits**	2
Instructor	SASANUMA Tsuneo	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioresource Science
How to use English	Depends on students		

・Purpose and Learning Goals

This course introduces various studies in plant ganetics and genomics covering comprehensive field from basic cytological to recent molecular researches. The goal of this seminar is to acquire knowledge enough to elucidate the plant genetics and genomics and apply it to students' own researches.

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

This course is to obtaine "the capacity to perform planning of survey and experiment, implementation, data analysis and discussion for the solution of the problems" in the DP in Department of Bioresource Science.

・Contents

This seminar will be held as presentation by participating students. In each class, one or two student(s) will introduce a research article and participants will have a discussion on the topic. The articles to be introduced will be chosen by students. Examples of the recomended topics are shown as below.

1. Studies on plant genome and polypoidy based on classical, cytologial and molecular genetics.
2. Diversity analyses on genetic resources.
3. Applied studies of plant genomics and genetics to breeding.

・Evaluation

Grading will be decided based on presentation and attitude in discussion.

・Notice for Students

Your active participation in discussion is expected.

Textbook	Handouts will be provided in the classes.
Reference book	References will be introduced in the classes.
Contact	The office of Tsuneo Sasanuma is on the 4th floor of the 3rd building. You can contact him via email (sasanuma@tds1.tr.yamagata-u.ac.jp)

Seminar on Plant Genetics and Genomics
(2nd year winter semester)

Registration code	61392	**Credits**	2
Instructor	SASANUMA Tsuneo	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target program**	Bioresource Science
How to use English	Depends on students		

・Purpose and Learning Goals

This course introduces various studies in plant ganetics and genomics covering comprehensive field from basic cytological to recent molecular researches. The goal of this seminar is to acquire knowledge enough to elucidate the plant genetics and genomics and apply it to students' own researches.

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

This course is to obtaine "the capacity to perform planning of survey and experiment, implementation, data analysis and discussion for the solution of the problems" in the DP in Department of Bioresource Science.

・Contents

This seminar will be held as presentation by participating students. In each class, one or two student(s) will introduce a research article and participants will have a discussion on the topic. The articles to be introduced will be chosen by students. Examples of the recomended topics are shown as below.
1. Studies on plant genome and polypoidy based on classical, cytologial and molecular genetics.
2. Diversity analyses on genetic resources.
3. Applied studies of plant genomics and genetics to breeding.

・Evaluation

Grading will be decided based on presentation and attitude in discussion.

・Notice for Students

Your active participation in discussion is expected.

Textbook	Handouts will be provided in the classes.
Reference book	References will be introduced in the classes.
Contact	The office of Tsuneo Sasanuma is on the 4th floor of the 3rd building. You can contact him via email (sasanuma@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 program**	Bioresource Science
How to use English	**Only for handouts**		

・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	
Reference book	
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 program**	Bioresource Science
How to use English	**Only for handouts**		

・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	
Reference book	
Contact	16：10－17：10 on Monday

Postharvest Physiology

Registration code	61356	**Credits**	2
Instructor	MURAYAMA Hideki	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Lecture	**Target program**	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	
Reference book	
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 program**	Bioresource Science
How to use English	**Only for handouts**		

・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	
Reference book	
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 program**	Bioresource Science
How to use English	**Only for handouts**		

・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	
Reference book	
Contact	16：10－17：10 on Monday

Seminar on Metabolic Biochemistry
(1st year summer semester)

Registration code	61340	**Credits**	2
Instructor	OIKAWA Akira	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioresource Science
How to use English	To interpret Japanese as main language		

・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	
Reference book	
Contact	

Seminar on Metabolic Biochemistry
(1st year winter semester)

Registration code	61341	**Credits**	2
Instructor	OIKAWA Akira	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target program**	Bioresource Science
How to use English	To interpret Japanese as main language		

・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	
Reference book	
Contact	

Metabolic Biochemistry

Registration code	61357	**Credits**	2
Instructor	OIKAWA Akira	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Lecture	**Target program**	Bioresource Science
How to use English	To interpret Japanese as main language		

・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 in a single cell
3-4. Food metabolomics

・Evaluation

Comprehensive judgement from discussion on the lecture

・Notice for Students

Textbook	
Reference book	
Contact	

Seminar on Metabolic Biochemistry
(2nd year summer semester)

Registration code	61395	**Credits**	2
Instructor	OIKAWA Akira	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioresource Science
How to use English	To interpret Japanese as main language		

・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	
Reference book	
Contact	

Seminar on Metabolic Biochemistry
(2nd year winter semester)

Registration code	61396	**Credits**	2
Instructor	OIKAWA Akira	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target program**	Bioresource Science
How to use English	To interpret Japanese as main language		

・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	
Reference book	
Contact	

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 program**	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 program**	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**	2
Instructor	TAWARAYA Keitaro	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Lecture	**Target program**	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

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 program**	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 program**	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 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 program**	Bioresource Science
How to use English	Full use		

・Purpose and Learning Goals

To develop an understanding of the latest studies in soil science research.
To develop an understanding of the environmental impact of soil use and management.
To develop the latest knowledge of C and N dynamics in soil-plant ecosystems with greenhouse gas emissions.
To develop the latest knowledge of stable isotopes probing on biogeochemical processes.
To develop 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 of 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	
Reference book	
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 program**	Bioresource Science
How to use English	Full use		

・Purpose and Learning Goals

To develop an understanding of the latest studies in soil science research.
To develop an understanding of the environmental impact of soil use and management.
To develop the latest knowledge of C and N dynamics in soil-plant ecosystems with greenhouse gas emissions.
To develop the latest knowledge of stable isotopes probing on biogeochemical processes.
To develop 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 of 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	
Reference book	
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**	2
Instructor	CHENG, Weiguo	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Lecture	**Target program**	Bioresource Science
How to use English	Full use		

・Purpose and Learning Goals

To develop an understanding of the latest studies in soil science research.
To develop an understanding of the environmental impact of soil use and management.
To develop the latest knowledge of C and N dynamics in soil-plant ecosystems with greenhouse gases emissions.
To develop the latest knowledge of stable isotopes probing on biogeochemical processes.
To develop 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 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 program**	Bioresource Science
How to use English	Full use		

・Purpose and Learning Goals

To develop an understanding of the latest studies in soil science research.
To develop an understanding of the environmental impact of soil use and management.
To develop the latest knowledge of C and N dynamics in soil-plant ecosystems with greenhouse gas emissions.
To develop the latest knowledge of stable isotopes probing on biogeochemical processes.
To develop 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 of 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	
Reference book	
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 program**	Bioresource Science
How to use English	Full use		

・Purpose and Learning Goals

To develop an understanding of the latest studies in soil science research.
To develop an understanding of the environmental impact of soil use and management.
To develop the latest knowledge of C and N dynamics in soil-plant ecosystems with greenhouse gas emissions.
To develop the latest knowledge of stable isotopes probing on biogeochemical processes.
To develop 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 of 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	
Reference book	
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 .

Bioorganic Chemistry

Registration code	61362	**Credits**	2
Instructor	ABOSHI Takako	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Lecture	**Target program**	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	

Seminar on Nutritional Physiology
(1st year summer semester)

Registration code	61416	**Credits**	2
Instructor	SUZUKI Takuji	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioresource Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

This course deals with the basic concepts and principles of nutritional physiology through the read of the latest scientific journals. It also enhances the development of students' skills in making oral presentation and self-regulated learning for research.

By the end of the course, students should be able to do the following tasks:

・Read the latest scientific reports involved in nutritional physiology.

・Learn the nutritional physiological knowledge from basic to application.

・Obtain the reading skills of the scientific reports

・Learn the logical thought and how to proceed with scientific research.

・Learn the technique of presentation.

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

This course deals with the understanding of the latest methods and world-wide problems about nutritional physiology through the read of the latest scientific journals. Also, students can make use of the things that they learned there for their own researches.

・Contents

1.Course guidance and theme setting.
2.Research theme sharing and methods of presentation.
3.Methods of genetic analysis on nutritional physiology.
4.Methods of proteinic analysis on nutritional physiology.
5.Methods in each research theme.
6.Statistical analysis on nutritional physiology.
7.Retrieval method of the latest scientific journals and explanation of the characteristics of English scientific reports.
8.Reading scientific journal-part 1 (Digestive tract : small intestinal functions).
9.Reading scientific journal -part 2 (Digestive tract : neural network in digestive tract).
10.Reading scientific journal -part 3 (Digestive tract : gastrointestinal hormones)
11.Reading scientific journal -part 4 (Digestive tract : aging of digestive tract).
12.Reading scientific journal -part 5 (Digestive tract : intestinal flora).
13.Reading scientific journal -part 6 (Digestive tract : gastrointestinal diseases).
14.Reading scientific journal -part 7 (Functional nutrients and food components).
15.Reading scientific journal -part 8 (Latest nutrition therapy) and course's review.

・Evaluation

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

・Comprehension levels of scientific journal.

・Creation of handouts and presentation slides.

・Attitude of aggressive attendance.

・Notice for Students

This course will be taught in Japanese. But handouts will be prepared in English as necessary.
The other notices are as below:

・Actively participate to this course.
・Ask any question during class if there are unclear points.
・Please participate to this course with any interests and consideration.
・Please not forget the preparations for presentation.

Textbook	Will be introduced as necessary.
Reference book	Will be introduced as necessary.
Contact	Mail to: taksuzuk@e.yamagata-u.ac.jp

Seminar on Nutritional Physiology
(1st year winter semester)

Registration code	61417	**Credits**	2
Instructor	SUZUKI Takuji	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target program**	Bioresource Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

This course deals with the basic concepts and principles of nutritional physiology through the read of the latest scientific journals. It also enhances the development of students' skills in making oral presentation and self-regulated learning for research.

By the end of the course, students should be able to do the following tasks:

・Read the latest scientific reports involved in nutritional physiology.

・Learn the nutritional physiological knowledge from basic to application.

・Obtain the reading skills of the scientific reports

・Learn the logical thought and how to proceed with scientific research.

・Learn the technique of presentation.

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

This course deals with the understanding of the latest methods and world-wide problems about nutritional physiology through the read of the latest scientific journals. Also, students can make use of the things that they learned there for their own researches.

・Contents

1.Course guidance and theme setting.
2.Research theme sharing and methods of presentation.
3.Methods of genetic analysis on nutritional physiology.
4.Methods of proteinic analysis on nutritional physiology.
5.Methods in each research theme.
6.Statistical analysis on nutritional physiology.
7.Retrieval method of the latest scientific journals and explanation of the characteristics of English scientific reports.
8.Reading scientific journal-part 1 (Digestive tract : small intestinal functions).
9.Reading scientific journal -part 2 (Digestive tract : neural network in digestive tract).
10.Reading scientific journal -part 3 (Digestive tract : gastrointestinal hormones)
11.Reading scientific journal -part 4 (Digestive tract : aging of digestive tract).
12.Reading scientific journal -part 5 (Digestive tract : intestinal flora).
13.Reading scientific journal -part 6 (Digestive tract : gastrointestinal diseases).
14.Reading scientific journal -part 7 (Functional nutrients and food components).
15.Reading scientific journal -part 8 (Latest nutrition therapy) and course's review.

・Evaluation

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

・Comprehension levels of scientific journal.

・Creation of handouts and presentation slides.

・Attitude of aggressive attendance.

・Notice for Students

This course will be taught in Japanese. But handouts will be prepared in English as necessary.
The other notices are as below:

・Actively participate to this course.
・Ask any question during class if there are unclear ~~things.~~ points.
・Please participate to this course with any interests and consideration.
・Please not forget the preparation~~s~~ for presentation.

Textbook	Will be introduced as necessary.
Reference book	Will be introduced as necessary.
Contact	Mail to: taksuzuk@e.yamagata-u.ac.jp

Seminar on Nutritional Physiology
(2nd year summer semester)

Registration code	61418	**Credits**	2
Instructor	SUZUKI Takuji	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioresource Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

This course deals with the basic concepts and principles of nutritional physiology through the read of the latest scientific journals. It also enhances the development of students' skills in making oral presentation and self-regulated learning for research.

By the end of the course, students should be able to do the following tasks:

・Read the latest scientific reports involved in nutritional physiology.

・Learn the nutritional physiological knowledge from basic to application.

・Obtain the reading skills of the scientific reports

・Learn the logical thought and how to proceed with scientific research.

・Learn the technique of presentation.

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

This course deals with the understanding of the latest methods and world-wide problems about nutritional physiology through the read of the latest scientific journals. Also, students can make use of the things that they learned there for their own researches.

・Contents

1.Course guidance and theme setting.
2.Research theme sharing and methods of presentation.
3.Methods of genetic analysis on nutritional physiology.
4.Methods of proteinic analysis on nutritional physiology.
5.Methods in each research theme.
6.Statistical analysis on nutritional physiology.
7.Retrieval method of the latest scientific journals and explanation of the characteristics of English scientific reports.
8.Reading scientific journal-part 1 (Digestive tract : small intestinal functions).
9.Reading scientific journal -part 2 (Digestive tract : neural network in digestive tract).
10.Reading scientific journal -part 3 (Digestive tract : gastrointestinal hormones)
11.Reading scientific journal -part 4 (Digestive tract : aging of digestive tract).
12.Reading scientific journal -part 5 (Digestive tract : intestinal flora).
13.Reading scientific journal -part 6 (Digestive tract : gastrointestinal diseases).
14.Reading scientific journal -part 7 (Functional nutrients and food components).
15.Reading scientific journal -part 8 (Latest nutrition therapy) and course's review.

・Evaluation

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

・Comprehension levels of scientific journal.

・Creation of handouts and presentation slides.

・Attitude of aggressive attendance.

・Notice for Students

This course will be taught in Japanese. But handouts will be prepared in English as necessary.
The other notices are as below:

・Actively participate to this course.
・Ask any question during class if there are unclear points.
・Please participate to this course with any interests and consideration.
・Please not forget the preparations for presentation.

Textbook	Will be introduced as necessary.
Reference book	Will be introduced as necessary.
Contact	Mail to: taksuzuk@e.yamagata-u.ac.jp

Seminar on Nutritional Physiology
(2nd year winter semester)

Registration code	61419	**Credits**	2
Instructor	SUZUKI Takuji	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target program**	Bioresource Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

This course deals with the basic concepts and principles of nutritional physiology through the read of the latest scientific journals. It also enhances the development of students' skills in making oral presentation and self-regulated learning for research.

By the end of the course, students should be able to do the following tasks:

・Read the latest scientific reports involved in nutritional physiology.

・Learn the nutritional physiological knowledge from basic to application.

・Obtain the reading skills of the scientific reports

・Learn the logical thought and how to proceed with scientific research.

・Learn the technique of presentation.

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

This course deals with the understanding of the latest methods and world-wide problems about nutritional physiology through the read of the latest scientific journals. Also, students can make use of the things that they learned there for their own researches.

・Contents

1.Course guidance and theme setting.
2.Research theme sharing and methods of presentation.
3.Methods of genetic analysis on nutritional physiology.
4.Methods of proteinic analysis on nutritional physiology.
5.Methods in each research theme.
6.Statistical analysis on nutritional physiology.
7.Retrieval method of the latest scientific journals and explanation of the characteristics of English scientific reports.
8.Reading scientific journal-part 1 (Digestive tract : small intestinal functions).
9.Reading scientific journal -part 2 (Digestive tract : neural network in digestive tract).
10.Reading scientific journal -part 3 (Digestive tract : gastrointestinal hormones)
11.Reading scientific journal -part 4 (Digestive tract : aging of digestive tract).
12.Reading scientific journal -part 5 (Digestive tract : intestinal flora).
13.Reading scientific journal -part 6 (Digestive tract : gastrointestinal diseases).
14.Reading scientific journal -part 7 (Functional nutrients and food components).
15.Reading scientific journal -part 8 (Latest nutrition therapy) and course's review.

・Evaluation

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

・Comprehension levels of scientific journal.

・Creation of handouts and presentation slides.

・Attitude of aggressive attendance.

・Notice for Students

This course will be taught in Japanese. But handouts will be prepared in English as necessary.
The other notices are as below:

・Actively participate to this course.
・Ask any question during class if there are unclear points.
・Please participate to this course with any interests and consideration.
・Please not forget the preparation for presentation.

Textbook	Will be introduced as necessary.
Reference book	Will be introduced as necessary.
Contact	Mail to: taksuzuk@e.yamagata-u.ac.jp

Special Lecture on Bioenvironmental Science

Registration code	61501	**Credits**	2
Instructor	Teaching staffs of Department of Bioenvironmental Science	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Lecture	**Target program**	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 master first step to practice research activities and write a master's thesis. This course deals with the basic research work as planning of research, literature reference and presentation.

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

・Contents

1)Introduction of research activities as literature reading and reference, research paper writing and presentation based on teaching staffs' experience.
2)Current topics of Forest Science Course and Environmental Science and Technology for Water and Land Use Cource.

1. Guidance
2. Message from the Director
3. Literature reading, reference and documentation 1
4. Literature reading, reference and documentation 1
5. Research presentation 1
6. Research presentation 1
7. Research paper writing
8. Research paper writing
9. Current research topics
10. Current research topics
11. Current research topics
12. Current research topics
13. Current research topics
14. Current research topics
15. An optional extra day

・Evaluation

Grading will be decided based on understanding of the foundations of research activities and calculated according to usual performance score and reports.

・Notice for Students

Students should communicate well with teaching staffs of this course.

Textbook	Textbook will be introduced in the class.
Reference book	Reference book will be introduced in the class.
Contact	

Special Seminar on Bioenvironmental Science
(1st year summer semester)

Registration code	61502	**Credits**	1
Instructor	Teaching staffs of Department of Bioenvironmental Science	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioenvironmental Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The purpose of this course is presentation and discussion on research programs or interim reports of a masters thesis. Students can check the progress of research and raise research results.

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

Related to diploma policy 1, 2 and 3 of Department of Bioenvironmental Science.

・Contents

Presentation and discussion on the research program of a master's thesis

・Evaluation

Grading will be decided based on presentation of the research program or interim report of a master thesis.

・Notice for Students

Presentation must be focused on your own research.

Textbook	Will be introduced from advising teacher.
Reference book	
Contact	

Special Seminar on Bioenvironmental Science
(2nd year summer semester)

Registration code	61619	**Credits**	1
Instructor	Teaching staffs of Department of Bioenvironmental Science	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioenvironmental Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The purpose of this course is presentation and discussion on research programs or interim reports of a masters thesis. Students can check the progress of research and raise research results.

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

Related to diploma policy 1, 2 and 3 of Department of Bioenvironmental Science.

・Contents

Presentation and discussion on the research program of a master's thesis

・Evaluation

Grading will be decided based on presentation of the research program or interim report of a master thesis.

・Notice for Students

Presentation must be focused on your own research.

Textbook	Will be introduced from advising teacher.
Reference book	
Contact	

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 program**	Bioenvironmental Science
How to use English	Lectures in Japanese and English		

・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 program**	Bioenvironmental Science
How to use English	Lectures in Japanese and English		

・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.

Technical Seminar on Resource Economics
(1st year summer semester)

Registration code	61557	**Credits**	1
Instructor	OGAWA Sanshiro	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioenvironmental Science
How to use English	Lectures in Japanese and English		

・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 tentative 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 document
Contact	The office of the instructor is on the 5th floor of the 2nd building. You can contact him anytime via email.

Technical Seminar on Resource Economics
(1st year winter semester)

Registration code	61558	**Credits**	1
Instructor	OGAWA Sanshiro	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target program**	Bioenvironmental Science
How to use English	Lectures in japanese and english		

・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 tentative 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 document
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.

Resource Economics

Registration code	61596	**Credits**	2
Instructor	OGAWA Sanshiro	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Lecture	**Target program**	Bioenvironmental Science
How to use English	Lectures in Japanese and English		

・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
(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 program**	Bioenvironmental Science
How to use English	Lectures in Japanese and English		

・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 program**	Bioenvironmental Science
How to use English	Lectures in Japanese and English		

・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.

Seminar on Forest Conservation and Management
(1st year summer semester)

Registration code	61525	**Credits**	2
Instructor	HAYASHIDA Mitsuhiro	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target program**	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 "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 forest conservation and management. 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 (70%) and attitude in discussion (30%).

・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 MH is on the 4th floor of the 2st building. You can contact him anytime via email (hayasida@tds1.tr.yamagata-u.ac.jp).

Seminar on Forest Conservation and Management
(1st year winter semester)

Registration code	61526	**Credits**	2
Instructor	HAYASHIDA Mitsuhiro	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target program**	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 "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 forest conservation and management. 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 (70%) and attitude in discussion (30%).

・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 MH is on the 4th floor of the 2st building. You can contact him anytime via email (hayasida@tds1.tr.yamagata-u.ac.jp).

Technical Seminar on Biodiversity
(1st year summer semester)

Registration code	61567	**Credits**	1
Instructor	HAYASHIDA Mitsuhiro	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioenvironmental Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The purpose of this course is to learn methods for the identification of plant and animal species, and to acquire advanced skills to ensure biological surveys in the field.

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

This course is to obtain DP(1) in Deparment of Bioenvironmental Science.

・Contents

1. Practices for research planning.
2. Planning for methods of survey.
3. Practices for field survey and species identification.
4. Practices for report and discussion.

・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 practices and discussion is expected.

Textbook	Handouts will be provided in the classes.
Reference book	NA
Contact	The office of MH is on the 4th floor of the 2st building. You can contact him anytime via email (hayasida@tds1.tr.yamagata-u.ac.jp).

Technical Seminar on Biodiversity
(1st year winter semester)

Registration code	61568	**Credits**	1
Instructor	HAYASHIDA Mitsuhiro	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target program**	Bioenvironmental Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The purpose of this course is to learn methods for the identification of plant and animal species, and to acquire advanced skills to ensure biological surveys in the field.

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

This course is to obtain DP(1) in Deparment of Bioenvironmental Science.

・Contents

1. Practices for research planning.
2. Planning for methods of survey.
3. Practices for field survey and species identification.
4. Practices for report and discussion.

・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 practices and discussion is expected.

Textbook	Handouts will be provided in the classes.
Reference book	NA
Contact	The office of MH is on the 4th floor of the 2st building. You can contact him anytime via email (hayasida@tds1.tr.yamagata-u.ac.jp).

Forest Conservation and Management

Registration code	61601	**Credits**	2
Instructor	HAYASHIDA Mitsuhiro	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Lecture	**Target program**	Bioenvironmental Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

The purpose of this lecture is to review and to discuss the conservation and management of coastal forests in Japan, especially the regeneration and improvement for coastal forests damaged by 2011 tsunami.

The learning goals of this course is to understand forest functions and characteristics and to obtain the capacity to disuss for solution of the problems.

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

This course is to obtain DP(1) in Deparment of Bioenvironmental Science.

・Contents

Lectures using Powerpoint and handousts, together with field work in Shonai coastal forests and report writing.

・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	The office of MH is on the 4th floor of the 2st building. You can contact him anytime via email (hayasida@tds1.tr.yamagata-u.ac.jp).

Seminar on Forest Conservation and Management
(2nd year summer semester)

Registration code	61642	**Credits**	2
Instructor	HAYASHIDA Mitsuhiro	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target program**	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 "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 forest conservation and management. 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 (70%) and attitude in discussion (30%).

・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 MH is on the 4th floor of the 2st building. You can contact him anytime via email (hayasida@tds1.tr.yamagata-u.ac.jp).

Seminar on Forest Conservation and Management
(2nd year winter semester)

Registration code	61643	**Credits**	2
Instructor	HAYASHIDA Mitsuhiro	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target program**	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 "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 forest conservation and management. 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 (70%) and attitude in discussion (30%).

・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 MH is on the 4th floor of the 2st building. You can contact him anytime via email (hayasida@tds1.tr.yamagata-u.ac.jp).

Seminar on Forest Snow and Ice Science
(1st year summer semester)

Registration code	61529	**Credits**	2
Instructor	Lopez Caceres Maximo Larry	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioenvironmental Science
How to use English	Full use		

・Purpose and Learning Goals

The aim of this seminar is to make students aware and understand the important role played by snow and ice in the formation of forests in heavy snowfall regions. The course includes a visit to the Yamagata University Research Forest, where students can experience the existence of forests under high snow cover and the water relations that exist between tree growth and snowmelt water. Students are also made familiar with meteorological measures such as air temperature, radiation, humidity, which strongly affect snow depth, desnsity and finally chemistry.

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

DP (1), (2) and (5).
CP (1), (3) and (4).

・Contents

Snow has a significant effect on forest ecosystems. In order to understand this effect a multi-disciplinary approach (Meteorology, soil science, hydrology, forest ecology, etc) is used to understand the interaction between the snow physical and chemical characteristics on forest growth and production. This understanding provides the tools for an effective forest management and watershed conservation strategy in heavy snowfall regions. The adaptation of tree species in heavy snow cover environment and the strategies involved in their adaptation.

・Evaluation

Attendance, Reports, Presentations of assigned topics relevant to the course and examination.

・Notice for Students

In order to understand the theoritical content of this seminar the students should be prepared to spend some days in the forest in winter to experience first hand the adaptation of forests in the Yamagata University Research Forest.

Textbook	Relevant literature is introduced during lecture
Reference book	NA
Contact	larry@tds1.tr.yamagata-u.ac.jp

Seminar on Forest Snow and Ice Science
(1st year winter semester)

Registration code	61530	**Credits**	2
Instructor	Lopez Caceres Maximo Larry	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target program**	Bioenvironmental Science
How to use English	Full use		

・Purpose and Learning Goals

Forest Management in this areas have to meet the conditions imposed by heavy snowfall and long periods of snow cover as well as the hydrological effect in the catchment areas as well as in the watersheds. In these seminars, we combine seminars in the laboratory to discuss relevant studies related to the forest in snow cover regions and field visits to the experimental forest. In these visits, different field measurements and analyse methods are conducted which are adapted to field conditions. These measurements and analyses provide the tools necessary for the understanding of the environment and ecosystems status and dynamics.

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

DP (1), (2) and (5).
CP (1), (3) and (4).

・Contents

Japan is one of the areas of the world where heavy snowfall is common, especially in the northeastern areas along the coast of Japan. This condition prompts a peculiar environment that not only affects natural ecosystems but also defines the culture and way of living. Therefore, in order to design adaptability strategies in this environment it is necessary to understand the characteristics of snow and ice and their relation with the natural ecosystems.

・Evaluation

Attendance, Reports, Presentations of assigned topics relevant to the course and examination.

・Notice for Students

In order to understand the theoritical content of this seminar the students should be prepared to spend some days in the forest in winter to experience first hand the adaptation of forests in the Yamagata University Research Forest.

Textbook	Relevant literature is introduced during lecture
Reference book	NA
Contact	larry@tds1.tr.yamagata-u.ac.jp

Technical Seminar on Forest Snow and Ice Science
(1st year summer semester)

Registration code	61573	**Credits**	1
Instructor	Lopez Caceres Maximo Larry	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioenvironmental Science
How to use English	Full use		

・Purpose and Learning Goals

To familiarize the students with forest environments during the dormant period and during the start of the growing season when snow stills heavily covers the soil.

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

DP (1), (2) and (5).
CP (1), (3) and (4).

・Contents

In the heavy snowfall regions of Japan, forests have a dormancy period of about four months. In this technical seminar, the focus is on the effect of snow physics during the snowmelt periods in winter and in spring. Mainly in the decoupling between the air and soil caused by the snow cover and the increase in air temperatures that control the initiation of the growing season, reflected by tree transpiration and photosynthesis.

・Evaluation

Attendance, Reports, Presentations of assigned topics relevant to the course and examination.

・Notice for Students

In order to understand the theoritical content of this seminar the students should be prepared to spend some days in the forest in winter to experience first hand the adaptation of forests in the Yamagata University Research Forest.

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

Technical Seminar on Forest Snow and Ice Science
(1st year winter semester)

Registration code	61574	**Credits**	1
Instructor	Lopez Caceres Maximo Larry	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target program**	Bioenvironmental Science
How to use English	Full use		

・Purpose and Learning Goals

To familiarize the students with forest environments during the dormant period and during the start of the growing season when snow stills heavily covers the soil.

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

DP (1), (2) and (5).
CP (1), (3) and (4).

・Contents

In the heavy snowfall regions of Japan, forests have a dormancy period of about four months. In this technical seminar, the focus is on the effect of snow physics during the snowmelt periods in winter and in spring. Mainly in the decoupling between the air and soil caused by the snow cover and the increase in air temperatures that control the initiation of the growing season, reflected by tree transpiration and photosynthesis.

・Evaluation

Attendance, Reports, Presentations of assigned topics relevant to the course and examination.

・Notice for Students

In order to understand the theoritical content of this seminar the students should be prepared to spend some days in the forest in winter to experience first hand the adaptation of forests in the Yamagata University Research Forest.

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

Forest Snow and Ice Science

Registration code	61603	**Credits**	2
Instructor	Lopez Caceres Maximo Larry	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Lecture	**Target program**	Bioenvironmental Science
How to use English	Full use		

・Purpose and Learning Goals

Students are expected to learn the the physical and chemical properties of snow and their effect on forest growth. The students are taught a multi-disciplinary approach on how to study forest responses to the environment. The students attending this seminar will be offered a solid base on forestry, hydrology, soil science and biochemistry.

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

DP (1), (2) and (5).
CP (1), (3) and (4).

・Contents

Snow has a significant effect on forest ecosystems. In order to understand this effect a multi-disciplinary approach (Meteorology, soil science, hydrology, forest ecology, etc) is used to understand the interaction between the snow physical and chemical characteristics on forest growth and production. Forests in Shonai Region have the peculiarity that forest activity starts not long after the initiation of the snowmelt. This seminar deals with the decoupling of air and soil temperature and how this decoupling prompts the start of forest activity where the forest acts as the link between the atmosphere and soil for water, carbon and nutrients cycles.

・Evaluation

Attendance, Reports, Presentations of assigned topics relevant to the course and examination.

・Notice for Students

In order to understand the theoritical content of this seminar the students should be prepared to spend some days in the forest in winter to experience first hand the adaptation of forests in the Yamagata University Research Forest.

Textbook	Relevant literature is introduced during lecture
Reference book	NA
Contact	larry@tds1.tr.yamagata-u.ac.jp

Seminar on Forest Snow and Ice Science
(2nd year summer semester)

Registration code	61646	**Credits**	2
Instructor	Lopez Caceres Maximo Larry	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioenvironmental Science
How to use English	Full use		

・Purpose and Learning Goals

Forest Management in this areas have to meet the conditions imposed by heavy snowfall and long periods of snow cover as well as the hydrological effect in the catchment areas as well as in the watersheds. In these seminars, we combine seminars in the laboratory to discuss relevant studies related to the forest in snow cover regions and field visits to the experimental forest. In these visits, different field measurements and analyse methods are conducted which are adapted to field conditions. These measurements and analyses provide the tools necessary for the understanding of the environment and ecosystems status and dynamics.

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

DP (1), (2) and (5).
CP (1), (3) and (4).

・Contents

Japan is one of the areas of the world where heavy snowfall is common, especially in the northeastern areas along the coast of Japan. This condition prompts a peculiar environment that not only affects natural ecosystems but also defines the culture and way of living. Therefore, in order to design adaptability strategies in this environment it is necessary to understand the characteristics of snow and ice and their relation with the natural ecosystems.

・Evaluation

Attendance, Reports, Presentations of assigned topics relevant to the course and examination.

・Notice for Students

In order to understand the theoritical content of this seminar the students should be prepared to spend some days in the forest in winter to experience first hand the adaptation of forests in the Yamagata University Research Forest.

Textbook	Relevant literature is introduced during lecture
Reference book	NA
Contact	larry@tds1.tr.yamagata-u.ac.jp

Seminar on Forest Snow and Ice Science
(2nd year winter semester)

Registration code	61647	**Credits**	2
Instructor	Lopez Caceres Maximo Larry	**Coordinator** in case of invited lectures	NA
Academic year	2nd year	**Semester**	Winter
Style of course	Seminar	**Target program**	Bioenvironmental Science
How to use English	Full use		

・Purpose and Learning Goals

Forest Management in this areas have to meet the conditions imposed by heavy snowfall and long periods of snow cover as well as the hydrological effect in the catchment areas as well as in the watersheds. In these seminars, we combine seminars in the laboratory to discuss relevant studies related to the forest in snow cover regions and field visits to the experimental forest. In these visits, different field measurements and analyse methods are conducted which are adapted to field conditions. These measurements and analyses provide the tools necessary for the understanding of the environment and ecosystems status and dynamics.

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

DP (1), (2) and (5).
CP (1), (3) and (4).

・Contents

Japan is one of the areas of the world where heavy snowfall is common, especially in the northeastern areas along the coast of Japan. This condition prompts a peculiar environment that not only affects natural ecosystems but also defines the culture and way of living. Therefore, in order to design adaptability strategies in this environment it is necessary to understand the characteristics of snow and ice and their relation with the natural ecosystems.

・Evaluation

Attendance, Reports, Presentations of assigned topics relevant to the course and examination.

・Notice for Students

In order to understand the theoritical content of this seminar the students should be prepared to spend some days in the forest in winter to experience first hand the adaptation of forests in the Yamagata University Research Forest.

Textbook	Relevant literature is introduced during lecture
Reference book	NA
Contact	larry@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 program**	Bioenvironmental Science
How to use English	This course will be taught in Japanese and English.		

・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	
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 program**	Bioenvironmental Science
How to use English	This course will be taught in Japanese and English.		

・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	
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).

Technical Seminar on Environmental Hydraulic Engineering
(1st year summer semester)

Registration code	61575	**Credits**	1
Instructor	WATANABE Kazuya	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioenvironmental Science
How to use English	This course will be taught in Japanese and English.		

・Purpose and Learning Goals

The purpose of this course is to learn about the methodologies (e.g. reseach planning, data collection, sampling strategy, data analysis etc) in the general process for environmental risk analysis via practical training. The goal of this course is to be able to implement environmental hydraulic engineering using the methodologies.

・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) Practices for research planning.
2) Practices for data collection.
3) Practices for field survey.
4) Practices for report and discussion.

The 1st - 3rd classes are held on the summer semester, while the remaining is in the winter seminar.)

・Evaluation

Grading will be decided based on your attitude in practices (70%) and assessment of presentation and discussion (30%).

・Notice for Students

Your active participation in practices and discussion is expected.

Textbook	Handouts will be provided in the classes.
Reference book	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).

Technical Seminar on Environmental Hydraulic Engineering
(1st year winter semester)

Registration code	61576	**Credits**	1
Instructor	WATANABE Kazuya	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target program**	Bioenvironmental Science
How to use English	This course will be taught in Japanese and English.		

・Purpose and Learning Goals

The purpose of this course is to learn about the methodologies (e.g. reseach planning, data collection, sampling strategy, data analysis etc) in the general process for environmental risk analysis via practical training. The goal of this course is to be able to implement environmental hydraulic engineering using the methodologies.

・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) Practices for research planning.
2) Practices for data collection.
3) Practices for field survey.
4) Practices for report and discussion.

The 1st - 3rd classes are held on the summer semester, while the remaining is in the winter seminar.)

・Evaluation

Grading will be decided based on your attitude in practices (70%) and assessment of presentation and discussion (30%).

・Notice for Students

Your active participation in practices and discussion is expected.

Textbook	Handouts will be provided in the classes.
Reference book	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).

Environmental Hydraulic Engineering

Registration code	61604	**Credits**	2
Instructor	WATANABE Kazuya	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Lecture	**Target program**	Bioenvironmental Science
How to use English	This course will be taught in Japanese and English.		

・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
(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 program**	Bioenvironmental Science
How to use English	This course will be taught in Japanese and English.		

・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	
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 program**	Bioenvironmental Science
How to use English	This course will be taught in Japanese and English.		

・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	
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 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 program**	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	None
Reference book	None
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 program**	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	None
Reference book	None
Contact	12:00-13:00 of Thursday

Land Resource Sciences

Registration code	61607	**Credits**	2
Instructor	ISHIKAWA Masaya	**Coordinator** in case of invited lecturer	NA
Academic year	1st year	**Semester**	Summer
Style of course	Lecture	**Target program**	Bioenvironmental Science
How to use English	Only for handouts		

・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	None
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 program**	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	None
Reference book	None
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 program**	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	None
Reference book	None
Contact	12:00-13:00 of Thursday

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 program**	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 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 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 program**	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 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 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).

Technical Seminar on Environmental Risk Analysis
(1st year summer semester)

Registration code	61587	**Credits**	1
Instructor	WATANABE Toru	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target program**	Bioenvironmental Science
How to use English	Full use		

・Purpose and Learning Goals

The purpose of this course is to learn about the methodologies (e.g. reseach planning, data collection, sampling strategy, chemical analysis, instrumental analysis and risk calculation) in the general process for environmental risk analysis via practical training. The goal of this course is to be able to implement environmental risk analysis using the methodologies.

・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: Practices for research planning.
5th to 10th classes: Practices for data collection.
11th to 13th classes: Practices for risk analysis.
14th and 15th classes: Practices for report and discussion.
(The 1st to 8th classes are held in the summer semester, while the remaining classes are in the winter seminar.)

・Evaluation

Grading will be decided based on your attitude in practices (70%) and assessment of presentation and discussion (30%).

・Notice for Students

Your active participation in practices and 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).

Technical Seminar on Environmental Risk Analysis
(1st year winter semester)

Registration code	61588	**Credits**	1
Instructor	WATANABE Toru	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target program**	Bioenvironmental Science
How to use English	Full use		

・Purpose and Learning Goals

The purpose of this course is to learn about the methodologies (e.g. reseach planning, data collection, sampling strategy, chemical analysis, instrumental analysis and risk calculation) in the general process for environmental risk analysis via practical training. The goal of this course is to be able to implement environmental risk analysis using the methodologies.

・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: Practices for research planning.
5th to 10th classes: Practices for data collection.
11th to 13th classes: Practices for risk analysis.
14th and 15th classes: Practices for report and discussion.
(The 9th to 15th classes are held in the winter seminar, while the remaining classes should be already finished in the summer seminar.)

・Evaluation

Grading will be decided based on your attitude in practices (70%) and assessment of presentation and discussion (30%).

・Notice for Students

Your active participation in practices and 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 program**	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 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 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
(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 program**	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 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 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).

Environmental Risk Analysis

Registration code	61610	**Credits**	2
Instructor	WATANABE Toru	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Lecture	**Target program**	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 be able to understand concept of and analytical method for environmental risk.

・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 environmental risk.
5th to 8th classes: Lectures on analytical method for environmental risk.
9th to 13th classes: Lectures on application of environmental risk analysis.
14th & 15th classes: Discussion on environmental risk.

・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).

Technical Seminar on Institutional Analysis of Forest Government (1st year summer semester)

Registration code	61555	**Credits**	1
Instructor	HAYASHI Masahide	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Seminar	**Target program**	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 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 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	
Reference book	
Contact	hayashima@tds1.tr.yamagata-u.ac.jp

Technical Seminar on Institutional Analysis of Forest Government (1st year summer semester)

Registration code	61556	**Credits**	1
Instructor	HAYASHI Masahide	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Winter
Style of course	Seminar	**Target program**	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 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 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	
Reference book	
Contact	hayashima@tds1.tr.yamagata-u.ac.jp

Institutional Analysis of Forest Government

Registration code	61595	**Credits**	2
Instructor	HAYASHI Masahide	**Coordinator** in case of invited lectures	NA
Academic year	1st year	**Semester**	Summer
Style of course	Lecture	**Target program**	Bioenvironmental Science
How to use English	To interpret Japanese as main language		

・Purpose and Learning Goals

This course introduces how to explore better form of governance of forest use from the viewpoint of the new institutional social science. The goal of this course is to be able to understand analytical concepts of new institutional social science.

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

This course is to obtain DP(1) in Department of Bioenvironmental Science

・Contents

1st to 3rd classes: Institutional analysis of economic development
4th to 6th classes: Institutional analysis of economic organization
7th to 9th classes: Institutional analysis of forms of property rights
10th to 12th classes: Institutional analysis and sociology
13th to 15th classes: Institutional analysis of forest management
Each class contains lectures and discussion.

・Evaluation

Grading will be decided based on class attendance and discussion 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	
Contact	hayashima@tds1.tr.yamagata-u.ac.jp