

平成30年度 大学院生命農学研究科講義要覧(前期課程) 目次
2018 Syllabus for Graduate School of Bioagricultural Sciences (Master's Program)

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	生命農学本論 Principles of Bioagricultural Sciences		1				J
2			1				E
	研究リテラシー Research Literacy			1			J
3				1			E
4	森林環境学特論 Forest Environment Science	竹中・太田・田中・富岡・小谷			1		B
5	森林生物学特論 Forest Biology	戸丸・肘井・梶村・中川(弥)・小川・土岐		1			B
6	森林社会学特論 Forest Sociology	原田・田中・砂野			1		B
7	森林資源産業化特論 Forest Resource Industrialization	山崎・山本(一)・山本(浩)・安藤		1			B
8	土壌学特論 Advanced Soil Science	浅川・村瀬・渡邊(健)・渡邊(彰)	1				B
9	バイオマス科学特論 Advanced Biomass Science	福島・山本(浩)・吉田・松下・青木・松尾・今井	1				B
10	木質細胞学特論 Wood Cytology	福島・山本(浩)・吉田・松下・青木・松尾・今井			1		B
11	生物材料解析学特論 Analysis for Biological Materials	土川・山崎・安藤・稲垣	1				E'
12	非線形材料力学特論 Nonlinear Mechanics of Materials	山崎・安藤			1		B
13	植物分子遺伝学特論 Plant Molecular Genetics	中園・高橋	1				B
14	植物分子育種学特論 Plant Molecular Breeding	松岡・佐塚・北野・上口(美)・土井・西内			1		E'
15	園芸科学特論 Advanced Horticultural Science	松本・白武・太田垣		1			B
16	作物科学特論 Advanced Crop Science	近藤(始)・矢野		1			B
17	作物ストレス生理学特論 Plant Stress Physiology	山内・三屋・谷口・大井		1			E'
18	植物病理学特論 Advanced Plant Pathology	竹本・千葉・佐藤(育)・柘植・吉岡・川北			1		E'
19	農業経済学特論 Agricultural Economics	竹下・三浦(聡)			1		B
20	国際農学特論 International Agriculture	江原・横原・伊藤(香)・犬飼	1				E'
21	植物研究アプローチ特論 Research Approaches for Plant Science	芦苺・森・榊原			1		B
22	動物解剖生理学特論 Animal Morphology and Physiology	山本(直)・阿部・本道・大森			1		B
23	動物遺伝学特論 Animal Genetics and Genomics	松田(洋)・一柳・石川・山縣			1		B
24	動物生理学特論1 Advanced Animal Physiology 1	吉村(崇)・大川・阿部・中根	1				B
25	動物生理学特論2 Advanced Animal Physiology 2	堀尾・小林(美)・村井・塚田		1			B
26	動物生殖学特論 Advanced Animal Reproduction	東村・上野山・井上	1				E
28	動物生産学特論 Animal Production	大蔵・松山・森田			1		E'
29	応用昆虫学特論 Applied Entomology	三浦(健)・水口	1				E'
30	昆虫病理学特論 Insect Pathology	池田・山田		1			B
31	有機合成化学特論 Synthetic Organic Chemistry	西川・中崎・安立	1				B
32	ケミカルバイオロジー特論 Chemical biology	北・柴田(貴)	1				B
33	生物活性物質化学特論 Advanced Bioactive Natural Products Chemistry	小鹿・中川(優)・近藤(竜)			1		B
34	機能性高分子化学特論 Functional Polymer Chemistry	青井・野村		1			B
35	酵素学特論1 Enzymology 1	吉村(徹)		1			E
36	酵素学特論2 Enzymology 2	吉村(徹)・邊見・伊藤(智)			1		B
37	分子細胞生物学特論1 Advanced Molecular Cell Biology 1	柴田(秀)・牧・高原・マツラナ	1				B
38	分子細胞生物学特論2 Advanced Molecular Cell Biology 2	松田(幹)・瀧野・大島・新美		1			B
39	栄養生化学特論 Nutritional Biochemistry	下村・小田・北浦			1		B
40	応用微生物学特論 Applied Microbiology	小林(哲)・木村・金丸		1			B
41	植物栄養学特論 Photosynthesis and Plant Nutrition	小俣・榊原・藤田		1			B
42	植物分子細胞生物学特論 Plant Cell and Molecular Biology	前島・森・伊藤(正)		1			B
43	植物生理学特論 Advanced Plant Physiology	森田・山篠・武田	1				B
44	植物発生学特論 Plant Developmental Biology	服部・上口(智)・石黒	1				B
45	生物分子工学特論 Biomolecular Engineering	中野・岩崎・兒島・ダムナニョヴィッチ		1			E'
46	糖鎖生物学特論 Glycobiology	北島・佐藤(ち)		1			B
47	生物情報学特論 Bioinformatics	石黒・中部大 鈴木 (非常勤講師)					J
48	Basics of Bioagricultural Sciences	井上・富岡・柴田・近藤(竜)・渡邊(健)・土井・三屋					E
	多文化共生特論1 Special Lecture on Multicultural Societies 1						E
	多文化共生特論2 Special Lecture on Multicultural Societies 2						E
	グローバルリーダー1 Global Leader 1						B
	グローバルリーダー2 Global Leader 2						B
	グローバルリーダー3 Global Leader 3						B
	グローバルリーダー4 Global Leader 4						B
	生命農学基盤実験 Basic Practical Courses						
49	(森林環境解析法) (Forest Environment Analysis)	竹中・太田・田中・山本(一)・富岡・小谷					B
50	(森林生物調査法) (Laboratory/Field Course in Forest Biology)	肘井・戸丸・梶村・中川(弥)・小川・土岐					J
51	(応用分光分析法) (Applied Spectroscopy)	土川・稲垣					E'
52	(機能性木材設計法) (Design of Functional Engineering Wood)	山崎・安藤					B
	(構造機能解析法) (Methods in Structural and Functional Analyses)						B
	特別講義 Special Lectures						J/B/E
	国内実地研修 Advanced On-the-job Training						J
	海外実地研修 1 Advanced Oversea Training Program 1						E
	海外研修演習 1 Oversea Seminar 1						E
	生命農学演習1 Graduate Seminar 1	各研究室担当者	2				B
	生命農学演習2 Graduate Seminar 2	各研究室担当者			2		B
	生命農学演習3 Graduate Seminar 3	各研究室担当者					B
	生命農学演習4 Graduate Seminar 4	各研究室担当者					B
	修士論文研究1 Master's Thesis Research 1	各研究室担当者	3				B
	修士論文研究2 Master's Thesis Research 2	各研究室担当者			3		B
	修士論文研究3 Master's Thesis Research 3	各研究室担当者					B
	修士論文研究4 Master's Thesis Research 4	各研究室担当者					B

言語/Language

E: 英語
E': 英語。ただし、受講状況によって日本語に変更する場合がある。
B: 主に日本語。ただし、講義資料は主に英語。
J: 日本語

E: English
E': English, but there is a possibility of changing to Japanese according to students.
B: Japanese, but course materials are in English.
J: Japanese

【Course title : Principles of Bioagricultural Sciences】

• Credit : 1

• Language : English

• Instructor : Omnibus

• Semester : Spring Quarter 1

• Course Goals

Bioagricultural Sciences are integrated sciences aiming for the development of humankind in harmony with the environment through the expansion of the foundation of life science, advanced use of biological functions and resources, creation and conservation of life symbiosis environment, and technical development of sustainable biological production and advanced life science. In this lecture, we deepen our understanding of "Basic policy of education and research", "Basic goal of social contribution", and "The system of education and research" in the Graduate School of Bioagricultural Sciences. Moreover, we think about how frontier researches in academic fields that constitute Bioagricultural Sciences should be done, and get an overview of Bioagricultural Sciences from a social and international point of view.

• Course Content

1. "Basic policy of education and research", "Basic goal of social contribution" and "Education and research system" of the Graduate School of Bioagricultural Sciences
2. Frontier researches in the field of forest environment and resource sciences
3. Frontier researches in the field of plant production sciences
4. Frontier researches in the field of animal function and production sciences
5. Frontier researches in the field of biomolecular functional science
6. Bioagricultural sciences from a social point of view
7. Bioagricultural sciences from an international perspective

• Grading system : Evaluate each lesson by attendance and short report.

• Textbooks : Instructor will distribute prints.

• Recommended reading

• Remarks

• Contact information

Name : Satoru Tsuchikawa E-mail: st3842@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Research Literacy】

• Credit : 1

• Language : English

• Instructor : Omnibus

• Semester :
Spring Quarter 2

• Course Goals

It is aimed to understand essential items in conducting researches on Bioagricultural sciences.

• Course Content

1. Research ethics
2. Intellectual property
3. Handling of chemical substances
4. Safe handling of recombinant DNA experiments
5. Ethics of animal experimentation
6. Security export control system
7. Career path
8. Labor law

• Grading system

Evaluate each lesson by attendance and short report.

• Textbooks

Instructor will distribute prints.

• Recommended reading

• Remarks

• Contact information

Name : Satoru Tsuchikawa E-mail: st3842@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Forest Environment Science】

- Credit : 1
- Language : Japanese, but course materials are in English.
- Instructor : Takenaka C., Ohta T., Tanaka T., Tomioka R., Kotani A.
- Semester : Fall Quarter 1

• Course Goals

The goals of this course are to

- (1) understand the basic and comprehensive information on each environmental problem related with forest from international, interdisciplinary, and trans-disciplinary viewpoints.
- (2) obtain the ability of discussion about the solution for each problem in various spatiotemporal scales.

• Course Content

1. Global environmental problem related with forests
2. Forest environmental problems in developing countries
3. Hydrological environment in arctic forest and human activity
4. Vegetation, land use change and atmosphere
5. Dynamics of heavy metals from forest to ocean and human activity
6. Response of human society on changing arctic environment
7. Cognition and communication on forest influences
8. Conclusions and perspectives

• Grading system

Evaluate each lesson by attendance and short report.

• Textbooks

Instructor will distribute prints.

• Recommended reading

• Remarks

• Contact information

Name : Chisato TAKENAKA

E-mail:chisato@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Forest Biology】

• Credit : 1

• Language : Japanese, but course materials are in English.

• Instructor : N. Tomaru, N. Hijii, H. Kajimura, M. Nakagawa, K. Ogawa and W. Toki

• Semester : Spring Quarter 2

• Course Goals

The goal of this course is to understand research subjects and how to proceed with research in the field of Forest Biology, through reading, summarizing and introducing the latest research papers on forest organisms. The additional goal is to develop the ability for presentation and discussion and the English skills, necessary for research.

• Course Content

1. Course guidance
2. Introduction of research in Forest Biology

• Grading system

Grading will be decided based on attendance, presentation and participation in discussion.

• Textbooks

• Recommended reading

• Remarks

The students who wish to take this course should contact N. Tomaru in advance (by the end of April).

• Contact information

Name: Nobuhiro Tomaru E-mail: tomaru@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Forest Sociology】

- Credit : 1
- Language : Japanese, but course materials are in English.
- Instructor : HARADA Kazuhiro, TANAKA Takafumi, SUNANO Yui.
- Semester : Fall Quarter 1

- Course Goals

In this lecture, we will understand the relationships between natural environment, especially forests and human beings from the points of "disaster prevention", "policies" and "livelihoods" in Asia and Africa, and eventually aim investigate the realization of sustainable societies, in which nature and humans can coexist.

- Course Content

1. Diversity of context in forest-hydrological studies
2. Science-based advice or plural and conditional one
3. Local community in daily life and its activities in disasters
4. Forest and agricultural products and Land tenure/use in Tropical Asia
5. International climate change policies and local livelihood in Tropical Asia
6. Coexistent/conflict relationships between local people and wild animals
7. Traditional livelihood and culture adapted to environments in Africa
8. Traditional livelihood and culture adapted to environments in Asia

- Grading system

Grading will be decided based on attitude and reports.

- Textbooks

Printed materials will be distributed.

- Recommended reading

Nothing

- Remarks

- Contact information

Name : Kazuhiro Harada E-mail: harada@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Forest Resource Industrialization】

- Credit : 1
- Language : Japanese, but course materials are in English.
- Instructor : Mariko Yamasaki, Kazukiyo Yamamoto, Hiroyuki Yamamoto, Kosei Ando
- Semester : Spring Quarter 2

• Course Goals

In this lecture, through the consideration of the current problems in the field such as forestry, forestry industry, construction industry as lecture samples, we discuss ways to solve those problems and to industrialize forest resources. In the lecture, practitioners also participate in all stages of task extraction, field survey, and planning. In this lecture, we aim to comprehensively acquire basic skills necessary for real society, such as information organization ability, research ability, insight ability, planning ability, discussion ability and presentation ability.

• Course Content

1. Explanation of examples of making guidance samples. Presentation of tasks.
2. Presentation and discussion on the current problems in the field. Review of the contents of the field survey.
3. Field survey (1)
4. Field survey (2)
5. Field survey (3)
6. Field survey (4)
7. Group work on industrialization measures.
8. Proposal and discussion on industrialization measures.

- Grading system : Evaluate each lesson by attendance and presentation and report.

- Textbooks : Annual Report on Forest and Forestry.

- Recommended reading : Overseas case collections, and homepages of overseas companies etc.

• Remarks

• Contact information

Name : Mariko Yamasaki, Kazukiyo Yamamoto, Hiroyuki Yamamoto, Kosei Ando

E-mail: marikoy@, kazukiyo@, hiro@, musica@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Advanced Soil Science】

- Credit : 1
- Language : Japanese, but course materials are in English.
- Instructor : Akira Watanabe, Susumu Asakawa, Jun Murase, Takeshi Watanabe
- Semester : Spring Quarter 1

• Course Goals

1. To understand carbon cycling in pedosphere in terms of soil chemistry. To understand the contribution of soil organic matter to agricultural production and global environments.
2. To understand the soil ecosystems and the roles and functions of soil microbial community from the viewpoints of soil microbiology and soil chemistry. To understand the contribution of soil microorganisms to agricultural production and global environments.

• Course Content

1. Introduction
2. Carbon cycling in pedosphere with related to soil type, climate conditions, land use, and soil management. Mechanisms of carbon accumulation into soil in terms of properties and dynamics of soil organic carbon.
3. Roles and functions of soil microbial community focusing on rice-field-soil ecosystems
 - 1) Microbial features of subsystems in a rice fields (flooding water, oxic and anoxic layers of plow soil, percolating water, subsoil, and plant debris such as rice straw) and the community structure of microorganisms inhabiting each subsystem
 - 2) Methane dynamics in a rice field ecosystem from the viewpoints of global warming and soil microbiology
4. Environmental factors controlling the expression of beneficial functions of bioresources in soil, the strategies for the expression, and fundamental discipline to promote the functions in the viewpoints of biochemistry and microbial ecology
5. Review

- Grading system : Grading will be decided based on attendance, attitude in class and reports.

• Textbooks

- Recommended reading : Will be introduced in class.

• Remarks

• Contact information

Name : Akira Watanabe E-mail: akiraw@

Jun Murase E-mail: murase@

Susumu Asakawa E-mail: asakawa@

Takeshi Watanabe E-mail: watanabe@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Advanced Biomass Science】

- Credit : 1

- Language : Japanese, but course materials are in English.

- Instructor : Kazuhiko Fukushima, Hiroyuki Yamamoto, Takanori Imai, Masato Yoshida,
Yasuyuki Matsushita, Miyuki Matsuo, Dan Aoki

- Semester : Spring Quarter 1

- Course Goals
Obtain basic knowledge about the physical and chemical properties of woody biomass.

- Course Content
 1. Physical properties of woody biomass
 2. Chemical properties of major components in woody biomass
 3. Chemistry of extractives
 4. Summary

- Grading system
Evaluate each lesson by attendance and short report.

- Textbooks : Instructor will distribute prints.

- Recommended reading

- Remarks

- Contact information

Name : Kazuhiko Fukushima	E-mail: kazu@
Hiroyuki Yamamoto	E-mail: hiro@
Takanori Imai	E-mail: takaimai@
Masato Yoshida	E-mail: yoshida@
Yasuyuki Matsushita	E-mail: ysmatsu@
Miyuki Matsuo	E-mail: miyuki@
Dano Aoki	E-mail: daoki@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Wood Cytology】

• Credit : 1

• Language : Japanese, but course materials are in English.

• Instructor : Kazuhiko Fukushima, Hiroyuki Yamamoto, Takanori Imai, Masato Yoshida,
Yasuyuki Matsushita, Miyuki Matsuo, Dan Aoki

• Semester : Fall Quarter 1

• Course Goals

Obtain basic knowledge about wood cytology with concerning the tissue structure, environmental response, biosynthesis and imaging techniques for the components in the cell.

• Course Content

1. Tissue structure of wood and environmental response
2. Biosynthesis of the components in wood cells
3. Imaging techniques for the components in wood cells.
4. Summary

• Grading system

Evaluate each lesson by attendance and short report.

• Textbooks

Instructor will distribute prints.

• Recommended reading

• Remarks

• Contact information

Name : Kazuhiko Fukushima	E-mail: kazu@
Hiroyuki Yamamoto	E-mail: hiro@
Takanori Imai	E-mail: takaimai@
Masato Yoshida	E-mail: yoshida@
Yasuyuki Matsushita	E-mail: ysmatsu@
Miyuki Matsuo	E-mail: miyuki@
Dano Aoki	E-mail: daoki@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Analysis for Biological Materials】

- Credit : 1
- Language : English, but there is a possibility of changing to Japanese according to students.
- Instructor : Satoru Tsuchikawa, Mariko Yamasaki, Tetsuya Inagaki, Kosei Ando
- Semester : Spring Quarter 1

- Course Goals

The aim of this lecture is to deeply understand analytical methods such as statistics, experimental methods, analytical methods (finite element analysis etc.), nondestructive measurement for anisotropic materials and biological materials. It is also aimed to study related state-of-the-art research in wood science and technology.

- Course Content

1. Principle of spectroscopic nondestructive measurement for anisotropic materials and biological materials
2. Application of spectroscopic nondestructive measurement for anisotropic materials and biological materials
3. Theory of spectroscopic analysis by chemometrics
4. Spectroscopic analysis by chemometrics (Practice by Excel)
5. Principal of strength estimation for biological materials by Monte Carlo method
6. Application of strength estimation for biological materials by Monte Carlo method
7. Fundamentals of study on the fracture mechanism for biological materials by image analysis
8. Application of study on the fracture mechanism for biological materials by image analysis

- Grading system : Evaluate each lesson by attendance and short report.

- Textbooks : Instructor will distribute prints.

- Recommended reading

- Remarks

- Contact information

Name : Satoru Tsuchikawa, Mariko Yamasaki E-mail: st3842@, marikoy@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Nonlinear Mechanics of Materials】

- Credit : 1
- Language : Japanese, but course materials are in English.
- Instructor : Mariko Yamasaki, Kosei Ando
- Semester : Fall Quarter 1

- Course Goals

The aim of this lecture is to deeply understand theoretical and experimental methods for studying on nonlinear mechanics of materials for anisotropic materials. It is also aimed to acquire the necessary skills and knowledge needed to achieve a better performance in wood engineering studies.

- Course Content

1. Testing method for mechanical properties of anisotropic material under combined stress
2. Elastic properties of anisotropic material under combined stress
3. Yield strength of anisotropic material under combined stress
4. Failure criteria of anisotropic material under combined stress
5. Non-linear time dependence of Poisson's effect in anisotropic materials
6. Asymmetry of three-dimensional viscoelastic compliance matrix for anisotropic materials
7. Non-linear influence of moisture contents on the elastic constants in anisotropic materials.
8. Relationships between the microscopic processes of fracture and non-linear mechanics of materials for anisotropic materials

- Grading system

Evaluate each lesson by attendance and short report.

- Textbooks : Instructor will distribute prints.

- Recommended reading

- Remarks

- Contact information

Name : Mariko Yamasaki, Kosei Ando E-mail: marikoy@, musica@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Plant Molecular Genetics】

- Credit : 1
- Language : Japanese, but course materials are in English.
- Instructor : Mikio Nakazono, Hirokazu Takahashi
- Semester : Spring Quarter 1

- Course Goals

The goal of this course is to understand the importance of molecular genetics in Plant Sciences by learning “Structure and evolution of plant genome”, “New techniques for gene isolation”, “Gene recombination and genome editing”, “Epigenetics” and so on.

- Course Content

1. Structure and evolution of plant genome
2. Contribution of transposon to evolution of plant genome
3. Domestication genes: Change of phenotypes of plants by domestication
4. New techniques for gene isolation
5. Gene recombination and genome editing
6. Plant epigenetics 1
7. Plant epigenetics 2
8. Summary

- Grading system

Evaluate each lesson by attendance and short report.

- Textbooks

Instructor will distribute prints.

- Recommended reading

- Remarks

- Contact information

Name : Mikio Nakazono E-mail: nakazono@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Plant molecular breeding】

- Credit : 1
- Language : English, but there is a possibility of changing to Japanese according to students.
- Instructor : Makoto Matsuoka, Takashi Sazuka, Hidemi Kitano, Miyako Ueguchi-Tanaka, Kazuyuki Doi, Shunsaku Nishiuchi
- Semester : 2018 Autumn Semester

• Course Goals

In this course, we will deepen our understanding plant molecular breeding, and related genetics, molecular genetics, plant physiology, and remote sensing technology. We also aim to study state-of-the-art research on genome breeding, and to overview the importance of plant breeding from social and international points of view.

• Course Content

1. site visit
2. (Kitano) Isolation of useful genes controlling panicle architecture and applied study for rice plant breeding
3. (Matsuoka) Genome wide association analysis of rice
4. (Doi) Collecting genotype and phenotype information for genetic analysis
5. (Ueguchi-Tanaka) Gibberellin signal transduction and synthesis in rice
6. (Nishiuchi) Remote sensing technology by UAV expected to spread in agriculture
7. (Sazuka) Genome breeding of Energy crops
8. Summary, presentation, and discussion.

• Grading system

Evaluate each lesson by attendance and short report(70%), and presentation and discussion (30%).

- Textbooks : Instructor will distribute prints.

• Recommended reading

• Remarks

• Contact information

Name : Takashi Sazuka

E-mail:sazuka@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Advanced Horticultural Science】

• Credit : 1

• Language : Japanese, but course materials are in English.

• Instructor : Shogo MATSUMOTO, Katsuhiro SHIRATAKE, Shungo OTAGAKI, Michitaka NOTAGUCHI

• Semester : Spring Quarter 2

• Course Goals

The purpose of this course is to study about productivity improvement of horticultural crops based on physiology, biochemistry and molecular biology.

• Course Content

- 1 . Omics in horticultural crops I -Overview of the analytical methods-
- 2 . Omics in horticultural crops II - Transcriptome analysis-
- 3 . Omics in horticultural crops III - Proteome analysis-
- 4 . Omics in horticultural crops IV - Metabolome analysis-
- 5 . Molecular breeding of horticultural crops
- 6 . Functional genomics of horticultural crops using plant virus vectors
- 7 . A horticultural technique, grafting
- 8 . Frontiers of horticultural sciences
- 9 . Efficient breeding and cultivation of horticultural crops based on genome and genetic information

• Grading system

Evaluate each lesson by attendance and short report.

• Textbooks

Instructor will distribute prints.

• Recommended reading

• Remarks

• Contact information

Name : Shogo Matsumoto	E-mail:shogo@	*Add "agr.nagoya-u.ac.jp" next to @
Katsuhiro Shiratake	E-mail:shira@	*Add "agr.nagoya-u.ac.jp" next to @
Shungo Otagaki	E-mail:sotagaki@	*Add "agr.nagoya-u.ac.jp" next to @)
Michitaka Notaguchi	E-mail:notaguchi.michitaka@	*Add "b.mbox.nagoya-u.ac.jp" next to @

【Course title : Advanced Crop Science】

• Credit : 1

• Language : Japanese, but course materials are in English.

• Instructor : Motohiko KONDO, Katsuya YANO, Daisuke SUGIURA

• Semester : Spring Quarter 2

• Course Goals

For improving crop productivity together with its sustainability, this lecture aims to deepen the understanding of the physiological and ecological responses of crop plants to soil and atmospheric environments at individual and/or community levels. Improving plant nutrient acquisition is essential to enhance crop productivity under increased carbon dioxide concentration in the atmosphere. Therefore, we discuss solute movement in soil and nutrients acquisition strategy by crops. We also deepen our understanding on the genetic and environmental factors of crop yield potential limit and discuss future improvement strategies.

• Course Content

1. Plant production and carbon dioxide
2. Solute movement in soil
3. Strategies of soil nutrient acquisition by plants
4. Genetic and environmental factors for potential yield limit of crops and future improvement strategies

• Grading system

Evaluate each lesson by attendance and short report.

• Textbooks : Instructor will distribute prints.

• Recommended reading

• Remarks

• Contact information

Name : Motohiko KONDO

E-mail:chokai@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Plant stress physiology】

- Credit : 1
- Language : English, but there is a possibility of changing to Japanese according to students.
- Instructor : Akira Yamauchi, Shiro Mitsuya, Mana Nakata, Mitsutaka Taniguchi, Takao Oi
- Semester : Spring Quarter 2

• Course Goals

This lecture is to understand the response of crop plants to environmental issues at the cellular, individual and community levels. At the end of the course, students are expected to understand and explain the following: Basic principle of growth analysis and how to perform research, Effect of water and salinity stresses on the crop productivity and the adaptation strategy, Interactive effect of genotype, environment and management, Relationship between structure and function in plants, evolution and adaptation to environment, physiological and morphological mechanisms of plant adaptation to environmental stresses

• Course Content

1. Utilization of growth analysis method in crop stress physiology
2. Responses of crop roots to environments and their functional roles in plant growth
3. Experimental design for crop stress physiological researches
4. How to evaluate the interaction among genotype, environment and management
5. Ultrastructure of chloroplasts and photosynthetic mechanism
6. Variation in photosynthetic structures and functions
7. Response and adaptation of plants to environmental stresses

- Grading system : Evaluate each lesson by attendance and report

- Textbooks : Instructors will distribute prints

- Recommended reading

「Plant Physiology and Development 6th ed.」 「Biochemistry & Molecular Biology of Plants」

- Remarks

- Contact information

Akira Yamauchi E-mail:ayama@

Shiro Mitsuya E-mail:mitsuya@

Mana Nakata E-mail:mnakata@

Mitsutaka Taniguchi E-mail:taniguti@

Takao Oi E-mail:oitaka@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Advanced Plant Pathology】

- Credit : 1
- Language : English, but there is a possibility of changing to Japanese according to students.
- Instructor : Daigo TAKEMOTO, Sotaro CHIBA, Ikuo SATO, Hirofumi YOSHIOKA, Kazuhito KAWAKITA
- Semester : Fall Quarter 1
- Course Goals
The aim of this course is to learn advanced plant pathology including defense mechanisms of plants against pathogens, infection strategies of plant pathogens, relationship between plant and symbiotic fungi, and biological control using microorganisms and viruses to understand and discuss the way of disease control for sustainable agricultural production.
- Course Content
 1. Introduction of advanced plant pathology
 2. Infection strategies of Plant Pathogens
 3. Mechanisms of plant resistance to pathogens
 4. Symbiotic relationship between plant and endophytic fungi
 5. Application of microorganisms and viruses for plant protection
 6. Summary
- Grading system : Evaluate each lesson by attendance and short report.
- Textbooks : Instructor will distribute prints.
- Recommended reading : George N. Agrios 「Plant Pathology」 (5th edition) (Elsevier Academic Press)
- Remarks
- Contact information

Daigo TAKEMOTO E-mail: dtakemo@	Sotaro CHIBA E-mail: chiba@
Ikuo SATO E-mail: isato@	Hirofumi YOSHIOKA E-mail: hyoshiok@
Kazuhito KAWAKITA E-mail: kkawakit@	

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Agricultural Economics】

- Credit : 1
- Language : Japanese, but course materials are in English.
- Instructor : TAKESHITA Hironobu, MIURA Satoshi
- Semester : Fall Quarter 1

• Course Goals

The goal of this course are to

- 1) explain consumer behavior and farmer behavior from the viewpoint of microeconomics
- 2) understand the characteristics of food consumption and agricultural production

[Note] Students are required to attend the lecture, Socioeconomics Science of Food, which is a lecture on Agricultural Economics given in Japanese for undergraduate students.

• Course Content

1. Changes in food consumption under economic growth
2. World food problem
3. Micro economics for food demand
4. Technical and structural characteristics of agriculture
5. Production function and technical choice in agriculture
6. Technical progress: BC technology and M technology
7. Characteristics of market for agricultural products
8. Summary

• Grading system

Evaluate each lesson by attendance and short report.

- Textbooks : Instructor will distribute prints.

• Recommended reading

• Remarks

• Contact information

Name : TAKESHITA Hironobu E-mail:awa@

MIURA Satoshi E-mail:miuranet@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : International agriculture 】

- Credit : 1
- Language : English, but there is a possibility of changing to Japanese according to students.
- Instructor : Hiroshi Ehara, Daigo Makihara, Yoshiaki Inukai and Kasumi Ito
- Semester : Spring Quarter 1

• Course Goals

The aim of this course is to support graduate students acquire the necessary skills and knowledge needed to achieve a better performance in their international agricultural studies especially. The goals of this course are to develop the ability to think how to utilize outcomes from fundamental or basic agricultural/biological researches to social implementation program on rural development in the tropics.

• Course Content

- Climate and natural environment in the tropics
- Cultures based on agriculture and cultivation techniques in Asia-Pacific Region
- Current situation and issues of agriculture in African
- Improvement of crop varieties for stabilizing crop productivity
- Environmental issues in the tropics
- International cooperation for agricultural development

• Grading system

Your overall grade in the class will be decided based on class attendance and attitude in class

• Textbooks

Reference materials will be distributed in class.

• Recommended reading

Recommended materials will be informed in class.

• Remarks

• Contact information

Name : Hiroshi Ehara E-mail: Ehara@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Plant research 】

- Credit : 1
- Language : Japanese, but course materials are in English.
- Instructor : Motoyuki Ashikari, Hitoshi Sakakibara, Hitoshi Mori
- Semester : Fall Quarter 1

• Course Goals

The aim of this course is to help students acquire the necessary skills and knowledge needed to achieve a better understanding in plant science.

• Course Content

1. Genetic approach 1
2. Genetic approach 2
3. Molecular approach 1
4. Molecular approach 2
5. Biochemical approach 1
6. Biochemical approach 2
7. Application of basic plant science
8. Summary

• Grading system

Evaluate by attendance and report.

• Textbooks

Instructor will distribute prints.

• Recommended reading

• Remarks

• Contact information

Name : Motoyuki Ashikari

E-mail: ashi@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Advanced Animal Anatomy and Physiology】

- Credit : 1
- Language : Japanese, but course materials are in English.
- Instructor : Naoyuki YAMAMOTO, Hideki ABE, Eiichi HONDO, Yasushige OHMORI
- Semester : Fall Quarter 1

- Course Goals

The course aims to obtain knowledge of vertebrate body from advanced points of view on anatomy and physiology.

- Course Content

1. Sensory centers in fish (Yamamoto)
2. Motor centers in fish (Yamamoto)
3. Single neuronal morphology and its function: Using peptidergic neurons as a model (Abe)
4. Structure and function of fish olfactory system (Abe)
5. Implantation of embryo in mammals (Hondo)
6. Placenta of mammals (Hondo)
7. Structure and function of gastrointestinal endocrine cells (Ohmori)
8. Summary

- Grading system

Evaluate each lesson by attendance and short reports.

- Textbooks

Instructor will distribute prints.

- Recommended reading

- Contact information

Name : Naoyuki YAMAMOTO:nyama@ Hideki ABE: habe@ Eiichi Hondo: ehondo@
 Yasushige OHMORI: ohmori@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Animal Genetics and Genomics 】

- Credit : 1
- Language : Japanese, but course materials are in English.
- Instructor : Kenji Ichiyanagi, Yoichi Matsuda, Akira Ishikawa, Takahiro Yamagata
- Semester : Fall Quarter 1

• Course Goals

This course deals with the molecular basis of a variety of genetic phenomena in terms of genomic and phylogenetic evolution, epigenetics, and quantitative genetics, and also genetic researches on breeding of domestic animals and experimental model animals and conservation of animal genetic resources.

• Course Content

1. Mechanism of epigenetic regulation in animals
2. Analyses of genome, epigenome, and transcriptome using large-scale sequencing approaches
3. Genetic basis of quantitative traits
4. The principles of QTL analysis
5. Molecular genetics and evolution in animals (Estimation of molecular evolution rate)
6. Evolution and phylogenetic tree (Types of phylogenetic trees and methods for constructing them)
7. Characteristics of vertebrate genome structures and their evolution
8. Chromosome evolution in vertebrates with a central focus on sex chromosomes and microchromosomes

- Grading system : Evaluate each lesson by attendance and short report
- Textbooks : Instructors will distribute prints.

• Recommended reading

• Remarks

• Contact information

Name : Kenji Ichiyanagi E-mail: ichiyana@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Advanced Animal Physiology 1】

- Credit : 1
- Language : Japanese, but course materials are in English.
- Instructor : Takashi Yoshimura, Taeko Ohkawa, Hideki Abe, Yusuke Nakane
- Semester : Spring Quarter 1

• Course Goals

This course introduces animals' adaptation strategy to environment, experimental methodology to understand physiological studies, and usefulness of comparative biology approach.

• Course Content

1. Introduction of electrophysiology
2. Basics of live-imaging
3. Organisms and biological rhythms
4. Molecular mechanism of circadian rhythm
5. Biological rhythms and photoreception
6. Basis of photoperiodism
7. Molecular mechanism of seasonal adaptation

• Grading system

Evaluate each lesson by attendance and short report.

• Textbook

Instructor will distribute prints.

• Contact information

Name : Takashi Yoshimura	E-mail: takashiy@
Name : Taeko Ohkawa	E-mail: tohkawa@
Name : Hideki Abe	E-mail: habe@
Name : Yusuke Nakane	E-mail: nakane@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Advanced Animal Physiology 2】

- Credit : 1
- Language : Japanese, but course materials are in English.
- Instructor : HORIO Fumihiko, MURAI Atsushi, KOBAYASHI Misato, TSUKADA Akira
- Semester : Spring Quarter 2

• Course Goals

The aims of this course are to

- (1) obtain advanced knowledge of nutrient function.
- (2) understand the nutritional and genetic factors controlling the development of metabolic diseases.
- (3) understand the immunological function and mechanism of growth in avian species.

• Course Content

1. Immunological function and egg production in birds (MURAI)
2. Enhancement of immunity by nutrients (MURAI)
3. Endocrine mechanism of growth in chicken (TSUKADA)
4. Regulation of lipid metabolism by nutrients (KOBAYASHI)
5. Importance and characteristics of animal disease models in nutritional study (HORIO)
6. Nutritional factors affecting the development of metabolic diseases (HORIO)
7. Searching for causative genes in metabolic diseases (HORIO)

• Grading system

Evaluate each lesson by attendance and short report.

• Textbooks

Instructor will distribute prints.

• Recommended reading

• Remarks

• Contact information

Name : HORIO Fumihiko

E-mail:horiof@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Advanced Animal Reproduction】

- Credit : 1
- Language : English
- Instructor : Hiroko Tsukamura, Yoshihisa Uenoyama, Naoko Inoue
- Semester : Spring Quarter 1

• Course Goals

Sex and reproduction is controlled by nervous and endocrine system. In this course students will learn physiological roles, and interactions of physiological active substances including hormones, neurotransmitters, neuropeptides, growth factors, and cytokines.

• Course Content

Students will be assigned several chapters on the textbook written in English for summarization. Reading through entire chapters on the textbook is also required.

1. Introduction
2. Cell Biology of the Nervous System, Cell Membrane Structure and Functions, Membrane Transport
3. Electrical Excitability and Ion Channels, Lipids, The Cytoskeleton of Neurons and Glia
4. Intracellular Trafficking, Axonal Transport, Cell Adhesion Molecules
5. Myelin Structure and Biochemistry, Energy Metabolism and Brain, Synaptic Transmission and Cellular Signaling
6. Acetylcholine, Catecholamine, Serotonin
7. Histamine, Glutamate and Glutamate receptors, GABA
8. Purinergic Signaling, Peptides, G Protein
9. Cyclic Nucleotides in the Nervous System, Phosphoinositides, Calcium
10. Serine and Threonine Phosphorylation, Tyrosine Phosphorylation, Transcription Factors in the Central Nervous System
11. Development of the Nervous System Growth factors, Stem Cells in the Nervous System
12. Formation and Maintenance of Myelin, Axonal Growth in the Adult Mammalian Nervous System: Regeneration and Compensatory Plasticity, Molecular Mechanisms and Consequences of Immune and Nervous System Interactions
13. Neuroinflammation, Brain Ischemia and Reperfusion: Cellular and Molecular Mechanisms in Stroke Injury, Lipid Mediators: Eicosanoids, Docosanoids and Platelet-Activating Factor
14. Apoptosis and Necrosis, Endocrine Effect on the Brain and Their Relationship to Behavior, The Neurochemistry of Sleep and Wakefulness
15. Discussion and Remarks

- Grading system

Evaluation will be based on class attendance and attitude in class (40%), presentation (30%) and discussion (30%).
If you miss this class more than 30%, I evaluate your grades as 'absence'.

- Textbooks

Basic Neurochemistry: Principles of Molecular, Cellular, and Medical Neurobiology, eight edition,
Academic Press-Elsevier

- Recommended reading

- Remarks

- Contact information

Name : Hiroko Tsukamura E-mail: htsukamura@

*Add "nagoya-u.jp" next to @

【Course title : Animal Production Science】

• Credit : 1

• Language : English, but there is a possibility of changing to Japanese according to students.

• Instructor : Satoshi OHKURA, Shuichi MATSUYAMA, Yasuhiro MORITA

• Semester : Fall Quarter 1

• Course Goals

To achieve the efficient production of farm animal resources, it is important to understand the regulatory mechanisms of physiological functions in domestic animals. In this course, students learn the basics of physiology/behavioral physiology and consider how to apply such basic knowledge for farm animal production, especially for domestic ruminants. Students who take the course read books/reviews/papers regarding the farm animal production in turns, present the contents in summary and discuss about it. In particular, this lecture will focus on livestock industries in the Southeast Asia and issues on domestic animal farming in tropical area.

• Course Content

1. Introduction of livestock industries in the tropical area.
2. Wrap-up and presentation of each chapter of the text 1
3. Wrap-up and presentation of each chapter of the text 2
4. Wrap-up and presentation of each chapter of the text 3
5. Wrap-up and presentation of each chapter of the text 4
6. Wrap-up and presentation of each chapter of the text 5
7. Issues on domestic animal farming in tropical area
8. Summary

• Grading system

Grading will be evaluated based on the active participation for presentation and discussion in this course.

• Textbooks : Textbooks will be introduced in the class.

• Recommended reading : The information on books for reference will be provided as necessary.

• Remarks

• Contact information

Satoshi OHKURA E-mail: saohkura@

Shuichi MATSUYAMA E-mail:

Yasuhiro MORITA E-mail: ymorita@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Applied Entomology】

- Credit : 1
- Language : English, but there is a possibility of changing to Japanese according to students.
- Instructor : Ken Miura, Chieka Minakuchi
- Semester : Spring Quarter 1
- Course Goals
The goals of this course are to gain fundamental knowledge on
 - (i) Major technical elements for pest insect management that compose modern crop protection.
 - (ii) Trends on the relevant markets.
- Course Content
Attendees will be requested to make a Power Point presentation regarding above-mentioned subjects on a rotation basis. All attendees must participate in the discussion afterward.
- Grading system
Grading will be decided considering comprehensively your attendance, presentation and active participation in the discussion.
- Textbooks
Handouts will be passed out occasionally.
- Recommended reading
- Remarks
- Contact information
Name : Ken Miura E-mail: k-miura@ Name: Chieka Minakuchi E-mail: c_mina@
*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Insect Pathology】

- Credit : 1
- Language : Japanese, but course materials are in English.
- Instructor : Motoko Ikeda, Hayato Yamada
- Semester : Spring Quarter 2

- Course Goals

To understand basic and application of baculoviruses including classification, general features, infection processes, virus-host interactions and development as microbial pesticides and gene expression vectors, for generating new insights into broad and effective utilization of baculoviruses.

- Course Content

1. Entomopathogens
2. General features of insect viruses, baculoviruses
3. Infection process of baculoviruses
4. Baculovirus-host interactions
5. Application of baculoviruses
6. Summary

- Grading system

Evaluate each lesson by attendance and short report.

- Textbooks

“Baculovirus Molecular Biology” 3rd ed Rohrmann, GF (2013) NCBI

- Recommended reading

“Insect Pathology” 2nd ed Vega, FE & Kaya, HK (2012) Elsevier

- Remarks

- Contact information

Motoko Ikeda : mochiko@

Hayato Yamada : h_yamada@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Synthetic Organic Chemistry】

• Credit : 1

• Language : Japanese, but course materials are in English.

• Instructor : NISHIKAWA, Toshio; NAKAZAKI, Atsuo; ADACHI, Masaatsu

• Semester : Spring Quarter 1

• Course Goals

Chemistry of natural product is an important object in the field of bioagricultural sciences. This course introduces the fundamentals and practical examples of synthetic organic chemistry associated to natural product synthesis.

• Course Content

01. Fundamentals for natural product synthesis 1: Importance of stereochemistry

02. Fundamentals for natural product synthesis 2: Origins of stereoselective reactions

03. Fundamentals for natural product synthesis 3: Protecting groups

04. Fundamentals for natural product synthesis 4: Pericyclic reactions

05. Practical examples for natural product synthesis 1: Synthesis of natural products through pericyclic reaction as a key reaction

06. Practical examples for natural product synthesis 2: Chemistry for carbohydrates and related molecules

• Grading system

Evaluate each lesson by attendance and short report.

• Textbooks

• Recommended reading

• Remarks

• Contact information

Name : NISHIKAWA, Toshio E-mail: nisikawa@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Chemical Biology】

- Credit : 1
- Language : Japanese, but course materials are in English.
- Instructor : KITA, Masaki & SHIBATA, Takahiro
- Semester : Spring Quarter 1

• Course Goals

Human living environments are filled with huge numbers of synthetic chemical substances such as food ingredients, pharmaceuticals, agricultural chemicals, etc. in addition to natural origin chemical substances. Each of these chemical substances plays an important role in promoting human health and maintaining a comfortable life, such as treatment of diseases, preservation of food, increase of production and securing of foods, depending on the purpose of use. On the other hand, however, these chemical substances have also been found to have a great influence on the natural ecosystem and cause various adverse effects unfavorable to human beings and biological systems. In this lecture, from the viewpoint of chemical biology and drug metabolism, we will learn about the mechanism of action of chemical substances, focusing on bioactive natural products and functional food ingredients.

• Course Content

1. Introduction of chemical biology (office hour)
2. Chemical biology of bioactive natural products I
3. Chemical biology of bioactive natural products II
4. Chemical biology of bioactive natural products III
5. Chemical biology of functional food ingredients I
6. Chemical biology of functional food ingredients II
7. Chemical biology of functional food ingredients III
8. Discussion on chemical biology research and summary

• Grading system

Evaluate comprehensively by attendance, presentation, participation situation on discussion, and report.

• Textbooks : Instructor will distribute prints.

• Recommended reading

「Chemical Biology -Learning Through Case Studies」 H. Waldmann, P. Janning (eds), Wiley-VCH (2009)

• Remarks

• Contact information

Name : KITA, Masaki & SHIBATA, Takahiro E-mail: mkita@, shibatat@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Advanced Bioactive Natural Products Chemistry】

• Credit : 1 credit

• Language : Japanese, but course materials are in English.

• Instructor : OJIKI Makoto, NAKAGAWA Yu, KONDO Tatsuhiko

• Semester : Fall Quarter 1

• Course Goals

Understanding what are bioactive natural products, how they are classified, biosynthesized, function, and applied in the field of bioscience industries.

• Course Content

1. Introduction
2. Microbial bioactive natural products
3. Presentation on natural products by students
4. Natural product-based drug design (1)
5. Natural product-based drug design (2)
6. Purification methods for natural products (1)
7. Purification methods for natural products (2)
8. Summary

• Grading system

Commitment to the class is evaluated. Reports may also be requested for evaluation.

• Textbooks

Prints are distributed as appropriate.

• Recommended reading

• Remarks

• Contact information

Name : OJIKI Makoto

E-mail: ojika@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Functional Polymer Chemistry】

• Credit : 1

• Language : Japanese, but course materials are in English.

• Instructor : AOI Keigo, NOMURA Nobuyoshi

• Semester : Spring Quarter 2

• Course Goals

The aims of this course are to learn about macromolecular design of biofunctional polymers based on carbohydrates using synthetic organic chemistry. Students will be able to understand basic concepts of polymerization chemistry, synthesis of carbohydrate-related polymers and function of their polymers.

• Course Content

The contents of the course are as follows:

1. Organic synthesis and polymer synthesis
2. Fundamental metal catalysis
3. Bio-based polymer via precision polymerization
4. Principles of polymer chemistry (1)
5. Principles of polymer chemistry (2)
6. Synthesis and function of glycopolymers (1)
7. Synthesis and function of glycopolymers (2)

• Grading system

Grading will be decided based on class attendance and attitude, contribution to discussion, and reports.

• Textbooks : None

• Recommended reading : References will be shown in class.

• Remarks

This course will be taught in Japanese. But all of the course materials are in English. Students are recommended to prepare and review using the materials.

• Contact information

Name : AOI Keigo E-mail: aoi@

NOMURA Nobuyoshi E-mail: nnomura@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Enzymology 1】

- Credit : 1
- Language : English.
- Instructor : Tohru Yoshimura
- Semester : Spring Quarter 2

• Course Goals

The goals of this course are to

- (1) Understand basic principles of enzymatic reactions.
- (2) Understand basic properties of enzymes and coenzymes.
- (3) Obtain knowledge about the applications of enzymes.

• Course Content

1. Physicochemical principles of enzymatic reactions 1
2. Physicochemical principles of enzymatic reactions 2
3. Reaction mechanisms of enzyme and coenzyme 1
4. Reaction mechanisms of enzyme and coenzyme 2
5. Enzyme kinetics
6. Enzymology of vitamin B6 enzymes relating to amino acid metabolism 1
7. Enzymology of vitamin B6 enzymes relating to amino acid metabolism 2
8. Application of Enzymes

• Grading system

Evaluate each lesson by attendance and short reports.

• Textbooks

Instructor will distribute prints.

• Recommended reading

• Remarks

• Contact information

Name : Tohru Yoshimura

E-mail:yosimura@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Enzymology 2】

- Credit : 1
- Language : Japanese, but course materials are in English.
- Instructor : Tohru Yoshimura, Hisashi Hemmi, Tomokazu Ito
- Semester : Fall Quarter 1

- Course Goals

The goals of this course are to

- (1) Understand basic principles of enzymatic reactions.
- (2) Understand basic properties of enzymes and coenzymes.
- (3) Obtain knowledge about the applications of enzymes.

- Course Content

9. Physicochemical principles of enzymatic reactions 1
10. Physicochemical principles of enzymatic reactions 2
11. Reaction mechanisms of enzyme and coenzyme
12. Enzymology of the enzymes involved in isoprenoid biosynthesis 1
13. Enzymology of the enzymes involved in isoprenoid biosynthesis 2
14. Enzymology of the enzymes involved in isoprenoid biosynthesis 3
15. Enzymology of vitamin B6 enzymes relating to amino acid metabolism 1
16. Enzymology of vitamin B6 enzymes relating to amino acid metabolism 2

- Grading system

Evaluate each lesson by attendance and short reports.

- Textbooks

Instructor will distribute prints.

- Recommended reading

- Remarks

- Contact information

Name : Tohru Yoshimura	E-mail:yosimura@
Hisashi Hemmi	E-mail:hhemmi@
Tomokazu Ito	E-mail:ito-t@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Advanced Molecular Cell Biology I】

- Credit : 1
- Language : Japanese, but course materials are in English.
- Instructor : Hideki SHIBATA, Terunao TAKAHARA, Masatoshi MAKI, Andrés Daniel MATURANA
- Semester : Spring Quarter 1

- Course Goals

The main aims of this course are to help students understand the recent advancement in the field of molecular cellular biological studies, particularly in animal tissues and cells, and cell culture techniques, electrophysiological methods, cell bio-imaging, biochemical methods and cell biological and molecular biological methods.

- Course Content

- 1 . Signal transductions
- 2 . Post-transcriptional regulation and post-translational modification
- 3 . Membrane trafficking
- 4 . Ion channels, electrophysiological methods

- Grading system

Attendance and short report.

- Textbooks

Instructor will distribute prints.

- Recommended reading

Molecular Biology of the Cell, 6th edition

- Remarks

- Contact information

Name : Hideki SHIBATA E-mail: shibabou@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Advanced Molecular Cell Biology II】

- Credit : 1
- Language : Japanese, but course materials are in English.
- Instructor : Tsukasa MATSUDA, Daita NADANO, Tomoaki Niimi, Kenzi Oshima
- Semester : Spring Quarter 2

• Course Goals

The main aims of this course are to help students understand the recent advancement in the field of molecular cellular biological studies, particularly in tissues and cells, and cell culture techniques, electrophysiological methods, cell bio-imaging, biochemical methods and cell biological and molecular biological methods.

• Course Content

- 1 . Extracellular matrix for regenerative medicine
- 2 . Cytoskeleton and epithelial cells
- 3 . Cancer biology
- 4 . Endocytosis and intracellular digestion

• Grading system

Attendance and short report.

• Textbooks

Instructor will distribute prints.

• Recommended reading

Molecular Biology of the Cell, 6th edition

• Remarks

• Contact information

Name : Tsukasa MATSUDA E-mail: tmatsuda@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Nutritional Biochemistry】

- Credit : 1
- Language : Japanese, but course materials are in English.
- Instructor : Yoshiharu Shimomura, Hiroaki Oda, Yasuyuki Kitaura
- Semester : Fall Quarter 1
- Course Goals
Participants are expected to understand 1) digestion system and metabolism of nutrients and non-nutrients, 2) metabolic regulation of nutrients, and 3) prevention of life-related diseases through metabolism of nutrients.
- Course Content
 1. Overview of nutrients and non-nutrients
 2. Digestion and absorption of nutrients
 3. Regulation of sugar metabolism
 4. Regulation of protein metabolism
 5. Regulation of lipid metabolism
 6. Systemic regulation of nutrients metabolism
 7. Life-related diseases and nutrition
 8. Prevention life-related diseases through nutrition
- Grading system
Your final grade will be evaluated by usual discussion in class room and report.
- Textbooks : Handouts will be given.
- Recommended reading
- Remarks
- Contact information
Name : Yoshiharu Shimomura E-mail:shimo@
Hiroaki Oda E-mail:hirooda@
Yasuyuki Kitaura E-mail:ykitaura@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Applied Microbiology】

- Credit : 1
- Language : Japanese, but course materials are in English.
- Instructor : KOBAYASHI, Tetsuo, KIMURA, Makoto, KANAMARU, Kyoko
- Semester : Spring Quarter 2

- Course Goals

Filamentous fungi are important industrial microorganisms due to their outstanding capacity in production of useful compounds. The goals of this course are to obtain basic knowledge about fungal gene regulation and secondary metabolism that are essential to understand the latest researches in the related scientific fields.

- Course Content

1. Gene regulation in Prokaryotes
2. Gene regulation in Eukaryotic microorganisms
3. Industrial enzymes of fungal origin
4. Regulatory mechanisms of industrial enzyme production
5. Microorganisms and secondary metabolism
6. Secondary metabolites and their biological actions
7. Frontier researches in the field of molecular biology and genetics of secondary metabolism

- Grading system

Evaluate each lesson by attendance and short report.

- Textbooks

Instructor will distribute prints.

- Recommended reading

- Remarks

- Contact information

Name (E-mail) : KOBAYASHI, Tetsuo (koba@), KIMURA, Makoto (mkimura@), KANAMARU, Kyoko (Kanamaru@)

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Photosynthesis and Plant Nutrition】

- Credit : 1
- Language : Japanese, but course materials are in English.
- Instructor : Tatsuo Omata, Hitoshi Sakakibara, and Yuichi Fujita
- Semester : Spring Quarter 2

• Course Goals

The goals of this course are to understand various biochemical and physiological processes such as carbon assimilation, nitrogen assimilation, nitrogen fixation, pigment biosynthesis and growth control of plants, which support photoautotrophic growth of plants and algae.

• Course Content

1. Nitrate assimilation and its regulation
2. Factors determining the photosynthetic productivity
3. Biosynthesis of photosynthetic pigments
4. Photosynthesis and nitrogen fixation
5. Signal transduction of nitrogen nutrition
6. Nitrogen nutrition and growth regulation
7. Summary

• Grading system

Attendance and participation in discussion, and short report on the topics will be evaluated.

• Textbooks

• Recommended reading

Molecular Mechanism of Photosynthesis, 2nd Ed. R. Blankenship, Wiley-Blackwell (2014)

• Remarks

• Contact information

Name : Tatsuo Omata E-mail: omata@
 Yuichi Fujita E-mail: fujita@
 Hitoshi Sakakibara E-mail: sakaki@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Plant Molecular Cell Biology】

- Credit: 1
 - Language: Japanese, but course materials are in English.
 - Instructors: Masayoshi Maeshima, Hitoshi Mori, and Masaki Ito
 - Semester: Spring Quarter 2
 - Course Goals:

The aim of this course is to help graduate students acquire a deep understanding of the fundamental principles and the latest knowledge from advanced researches on plant molecular cell biology, particularly, cell cycle, ploidy-dependent cell enlargement in plants, diversity and physiological roles of plant hormones, molecular diversity of membrane transport systems.
 - Course Content
 1. Mechanisms for cell division and cell size increase in plants
 2. Ploidy-dependent cell enlargement in plants
 3. Plant-specific features of cell cycle regulation during organ growth
 4. Molecular diversity and function of membrane transport systems
 5. Molecular structure and biochemical function of ion pumps and ion channel
 6. Advances in plant membrane biology
 7. Biosynthesis of plant hormones and homeostasis
 8. Hormonal regulation of gene expression, cell differentiation, and growth
 - Grading system: Evaluate each lesson by attendance and short reports.
 - Textbooks: Instructors will distribute handout.
 - Recommended reading
 - Remarks
 - Contact information

Masayoshi MAESHIMA: maeshima@
Hitoshi MORI morihito@
Masaki ITO masakito@
- *Add "agr.nagoya-u.ac.jp" next to @

【Course title : Advanced Plant Physiology】

• Credit : 1

• Language : Japanese, but course materials are in English.

• Instructor : Miyo Terao Morita, Takafumi Yamashino, Shin Takeda

• Semester : Spring Quarter 1

• Course Goals

The goals of this course are to

- (1) Obtain basic knowledge about external cues that direct plant growth, perception of the cues, and following signal transduction pathway.
- (2) Understand the phytohormone metabolism and homeostasis, molecular mechanisms of hormonal signaling pathways, plant responses induced by light and molecular mechanisms underlying the responses.

• Course Content

1. Phytohormones and development
2. Phytohormone metabolism and homeostasis
3. Hormonal signaling pathway 1
4. Hormonal signaling pathway 2
5. Signals from sunlight 1
6. Signals from sunlight 2
7. Abiotic stress

• Grading system

Attendance and participation in discussion, and short report on the topics will be evaluated.

• Textbooks : Handouts and prints will be distributed.

• Recommended reading :

Chapters 15, 16, and 24 of "Plant Physiology and Development" sixth edition, Ed. Taiz, L. and Zeiger, E., Sinauer Associates, Inc.

• Remarks

Course content #7 will be incorporated with contents #1 to #6 appropriately. Thus, a class period for #1 to #6 will be 105 min.

• Contact information

Name : Miyo Terao Morita E-mail:mimorita@

Takafumi Yamashino E-mail:yamasino@

Shin Takeda

E-mail:takeda@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Plant Developmental Biology】

• Credit : 1

• Language : Japanese, but course materials are in English.

• Instructor : Tsukahoro Hattori, Chiharu Ueguchi, Sumie Ishiguro

• Semester : Spring Quarter 1

• Course Goals

This course deals with the processes and regulatory mechanisms of morphogenesis, organogenesis, histogenesis and cell differentiation that occur in the plant life cycle. The aim of this course is to build knowledge base to learn by yourself further latest advances in plant developmental biology.

• Course Content

1. Course outline
2. Embryo development
3. Vegetative growth and organ development
4. Root development
5. Flowering and floral organ development
6. Gametophyte development
7. Seed development
8. Seed dormancy and germination
9. Summary

• Grading system

Your overall grade in the class will be decided based on class attendance and attitude, reports.

• Textbooks : Handouts

• Recommended reading

Taiz/Zeiger Plant Physiology and Development 6th ed. (ISBN-13: 978-1605353531)

Chapter 17~21

• Remarks

• Contact information

Tsukahoro Hattori, E-mail:hattori@

Chiharu Ueguchi, E-mail:cueguchi@

Sumie Ishiguro, E-mail:guronyan@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Biomolecule Engineering】

- Credit : 1
- Language : English, but there is a possibility of changing to Japanese according to students.
- Instructor : Hideo NAKANO, Yugo IWASAKI, Takaaki KOJIMA, Jasmina DAMNJANOBIC
- Semester : Spring Quarter 2
- Course Goals
The goals of this course are to obtain overview of biomolecule engineering, and to understand cutting edge technologies related this field.
- Course Content
 1. Historical review and current trends of cell-free protein synthesis
 2. Current trends of monoclonal antibody technology
 3. Application of biotechnology to lipid-related fields
 4. Enzymology of lipid-related enzymes
 5. Directed evolution of proteins by using molecular display technologies)
 6. How to tackle Big Data in life science using bioinformatics)
 7. Determination and analysis of protein structure: Understanding of the structure-function relationship
 8. Discussion
- Grading system : Reports
- Textbooks: Prints are supplied if necessary.
- Recommended reading: Your final grade will be determined based on reports and in-class contribution.
- Remarks
- Contact information
Name : Hideo NAKANO E-mail:hnakano@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Glycobiology】

- Credit : 1
- Language : Japanese, but course materials are in English.
- Instructor : Ken KITAJIMA, Chihiro SATO
- Semester : Spring Quarter 2

• Course Goals

The purpose of the class is to understand structures, biosynthesis, biological functions and analytical methods of glycan chains of intra- and extracellular glycoconjugates, such as glycoproteins and glycolipids.

• Course Content

1. Questionnaires on basic knowledge of glycobiology
2. Introduction to Glycobiology (1)
3. Introduction to Glycobiology (2)
4. Presentation and discussion on biological phenomena (1)
5. Presentation and discussion on biological phenomena (2)
6. Presentation and discussion on biological phenomena (3)
7. Presentation and discussion on biological phenomena (4)
8. Summary

• Grading system

Evaluate each lesson by attendance and short report.

• Textbooks

Essential Glycobiology 3rd Edition (CSH press)

Download at:

<https://www.ncbi.nlm.nih.gov/books/?term=Essentials+of+Glycobiology%2C+3rd+edition>

• Recommended reading

• Remarks

• Contact information

Name : Ken Kitajima

E-mail: kitajima@

Chihiro Sato

E-mail: chi@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Bioinformatics】

- Credit : 1
- Language : Japanese
- Instructor : Takamasa Suzuki (Chubu University)
- Semester : Intensive course in August

- Course Goals

Recent advance in DNA sequencing technology has increased the amount of biological data, especially nucleotide sequences. Biologists are desired to be familiar with bioinformatics so that they can mine a lot of biologically meaningful information from huge sequence data by themselves. The goal of this course is that the students can analyze large sequence data by their personal computer.

- Course Content

1. Usage of Linux and file manipulation.
2. Using bioinformatics tools.
3. Introduction of computer program and application to bioinformatics.

- Grading system : Evaluate each lesson by attendance and short report.

- Textbooks : Information of the course will be presented at a website.

- Recommended reading

- Remarks

All students have to bring their personal computer, in which Linux was installed. The installation of Linux will be guided before the lecture. Students must be an administrator for their own PC so that some software may be installed on the PC during the lecture.

- Contact information

Name : Takamasa Suzuki
Sumie Ishiguro

E-mail:takamasa@
E-mail:guronyan@

*Add "thaliana.myhome.cx" next to @
*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Basics of Bioagricultural Sciences】

- Credit : 1
- Language : English.
- Instructor : Naoko Inoue, Hideki Shibata, Kazuyuki Doi, Tatsuhiko Kondo, Takeshi Watanabe, Shiro Mitsuya, Rie Tomioka,
- Semester : 2018 Spring Semester

• Course Goals

The aim of this course is to learn basics of bioagricultural sciences for own study. In this course students will learn animal science, plant science, cell biology, biochemistry, soil science, genetics and statistics.

• Course Content

1. Introduction (INOUE Naoko)
2. Basic animal science (INOUE Naoko)
3. Basic plant science (TOMIOKA Rie)
4. Basic cell biology (SHIBATA Hideki)
5. Basic biochemistry (KONDO Tatsuhiko)
6. Basic soil science (WATANABE Takeshi)
7. Basic genetics (DOI Kazuyuki)
8. Basic statistics (MITSUYA Shiro)

• Grading system

Evaluation will be based on class attendance and attitude in class (50%) and discussion (50%). If you miss this class more than 30%, I evaluate your grades as 'absence'.

• Textbooks

Instructor will distribute prints.

• Recommended reading

• Remarks

• Contact information

Name : Naoko Inoue

E-mail:ninoue@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Basic Practical Courses –Forest Environment Analysis-】

- Credit : 1
- Language : Japanese, but course materials are in English.
- Instructor : Takenaka C., Ohta T., Tanaka T., Yamamoto K., Tomioka R., Kotani A.
- Semester : 2018 Fall Semester (intensive course)

• Course Goals

The goals of this course are to

(1) learn various new advanced techniques for getting data from many types of environmental conditions and samples,

(2) obtain the ability of analysis for various data on forest environment in order to evaluate the forest environmental conditions and resources accurately.

• Course Content

1. Quantitative analytical methods of trace elements
2. Chemical speciation method of various elements
3. Distribution analysis of various elements
4. Terrain analysis of mountainous areas (I)
5. Terrain analysis of mountainous areas (II)
6. Observation and analysis of surface energy balance
7. Soil-plant-atmosphere model
8. Three-dimensional measurement method of forest and trees

• Grading system

Evaluate each lesson by attendance and short report.

• Textbooks

Instructor will distribute prints.

• Recommended reading

• Remarks

• Contact information

Name : Chisato TAKENAKA

E-mail:chisato@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Basic Practical Courses –Laboratory/Field Course in Forest Biology–】

• Credit : 1

• Language : Japanese

• Instructors : N Hijii, N Tomaru, H Kajimura, M Nakagawa, K Ogawa, W Toki

• Semester : 2018 Spring Semester (intensive course)

• Course Goals

The goals of this course are to (1) acquire the skills in identifying and surveying plants and animals, (2) understand the changes in morphological traits and species distribution according to the altitude and environmental gradients, and (3) obtain the knowledge about field work in mountainous areas.

• Course Content

1. Pre-learning and preparation for the field course
2. Field course in the Central Alps area (two-day trip)
3. Summary

• Grading system

Grading will be based on the course attendance, attitude in course and report(s).

• Textbooks

Handouts will be used in the course.

• Recommended reading

• Remarks

The number of students may be restricted due to the capacity. We highly recommend to take the subject, Forest Biology, and to have experience in carrying out a field survey.

• Contact information

Name : Michiko Nakagawa E-mail:miko@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Basic Practical Courses (Applied Spectroscopy)】

- Credit : 1
- Language : English, but there is a possibility of changing to Japanese according to students.
- Instructor : Satoru Tsuchikawa, Tetsuya Inagaki
- Semester : Spring Quarter 1 (Intensive course)

• Course Goals

The aim of this lecture is to learn the principle and detail operation of spectroscopy, imaging analysis and multivariate analysis for wood or biological materials (Capacity: 10 students)

• Course Content

1. Principle of spectroscopy
2. Basic operation of spectrophotometer for wooden materials
3. Applied operation of spectrophotometer for wooden materials
4. Theory of imaging analysis
5. Basic imaging analysis for wooden materials
6. Applied imaging analysis for wooden materials
7. Principle of multivariate analysis
8. Practice of multivariate analysis by Excel

• Grading system

Evaluate each lesson by attendance and short report.

• Textbooks

Instructor will distribute prints.

• Recommended reading

• Remarks

• Contact information

Name : Satoru Tsuchikawa, Tetsuya Inagaki E-mail: st3842@, inatetsu@

*Add "agr.nagoya-u.ac.jp" next to @

【Course title : Basic Practical Courses (Design of Functional Engineering Wood)】

- Credit : 1
- Language : Japanese, but course materials are in English.
- Instructor : Mariko Yamasaki, Kosei Ando
- Semester
- Course Goals

This course deals with the basic concepts and principals of the design methods of wood-based laminated materials. By the end of the course, students should be able to confirm the validity of the design and deeply understand the performance of wood-based materials through producing the actual materials and carrying out the performance evaluation tests of them.

- Course Content
 1. Design concepts of laminated materials
 2. Performance evaluation of the elements(laminas)
 3. Actual design of laminated materials
 4. Production of laminated materials I
 5. Production of laminated materials II
 6. Performance evaluation tests of laminated materials
 7. Performance evaluation of laminated materials
 8. Fracture criteria of laminated materials

- Grading system
Evaluate each lesson by attendance and short report.

- Textbooks
Instructor will distribute prints.

- Recommended reading

- Remarks

- Contact information

Name : Mariko Yamasaki, Kosei Ando E-mail: marikoy@, musica@

*Add "agr.nagoya-u.ac.jp" next to @