

Syllabus
for Study
in Special Course from Asia, Africa and the Pacific Rim

Shikoku Education Consortium

KAGAWA UNIVERSITY

(香川大学)

* If time schedule or other items are not specified, ask about them to the lecturer after consulting your advising professor.

(* 開講時期その他の事項が明示されていない場合は、指導教員に相談したうえで授業担当教員に確認すること。)

Course Subject Title(授業題目)

Advanced vegetable crop production

Credits (Units)(単位数)

1

Class Work Type(授業種別)

Lecture

Year of commencement(履修開始年次)

1st year

Semester(履修期間)

Spring term

Day/Period(時間割)

(Contact the lecturer to confirm the availability of the course)

Professor (Lecturer or Instructor)(担当教員名)

OKUDA Nobuyuki

Professor (Affiliation/Research Field)(担当教員所属)

Kagawa University/ Vegetable Horticulture

Professor (Telephone)(担当教員電話)

087-891-3073

Professor (E-Mail)(担当教員)

okuda.nobuyuki@kagawa-u.ac.jp

Keyword for the subject(キーワード)

development, growth, production, vegetable crop, strawberry

Content and Objectives(授業テーマと目的)

Introduction to vegetable crop production in Japan, and explanation of growth and development of vegetable crop.

Teaching Materials(教科書・参考書)

Computer projector / Printed synopsis

Evaluation of Results(成績評価の方法)

Submitted report at the completion of the course

Course Subject Title(授業題目)

Postharvest physiology in horticulture

Credits (Units)(単位数)

1

Class Work Type(授業種別)

Lecture

Year of commencement(履修開始年次)

1st year

Semester(履修期間)

Spring term

Day/Period(時間割)

(Contact the lecturer to confirm the availability of the course)

Professor (Lecturer or Instructor)(担当教員名)

KOSUGI Yusuke

Professor (Affiliation/Research Field)(担当教員所属)

Kagawa University/ Postharvest Horticulture

Professor (Telephone)(担当教員電話)

087-891-3076

Professor (E-Mail)(担当教員)

kosugi.yusuke@kagawa-u.ac.jp

Keyword for the subject(キーワード)

Ethylene, gene expression, senescence, vase (shelf) life

Content and Objectives(授業テーマと目的)

Physiological and molecular aspects of postharvest changes in ornamentals and vegetables

Teaching Materials(教科書・参考書)

Computer projector/Printed synopsis

Evaluation of Results(成績評価の方法)

Submitted report at the completion of the course

Course Subject Title(授業題目)

Fruit production and improvement

Credits (Units)(単位数)

1

Class Work Type(授業種別)

Lecture

Year of commencement(履修開始年次)

1st year

Semester(履修期間)

Spring term

Day/Period(時間割)

Thursday/2st

Professor (Lecturer or Instructor)(担当教員名)

BEPPU Kenji

Professor (Affiliation/Research Field)(担当教員所属)

Kagawa University/ Pomology

Professor (Telephone)(担当教員電話)

087-891-3075

Professor (E-Mail)(担当教員)

beppu.kenji@kagawa-u.ac.jp

Keyword for the subject(キーワード)

Fruit tree, Resources, Production system, Breeding

Content and Objectives(授業テーマと目的)

Introduction to resources, production system and breeding of fruit crops to understand the outline of fruit production and improvement.

Teaching Materials(教科書・参考書)

Computer projector / Printed synopsis

Evaluation of Results(成績評価の方法)

Evaluate a report submitted for every topic.

Course Subject Title (授業題目)

Crop production science

Credits (Units) (単位数)

1

Class Work Type (授業種別)

Lecture

Year of commencement (履修開始年次)

1st year

Semester (履修期間)

Spring term

Day/Period (時間割)

Wednesday/2nd

Professor (Lecturer or Instructor) (担当教員名)

TOYOTA Masanori

Professor (Affiliation/Research Field) (担当教員所属)

Kagawa University/ Bioresource Production Science / Plant Resource Production

Professor (Telephone) (担当教員電話)

087-891-3058

Professor (E-Mail) (担当教員)

toyota.masanori@kagawa-u.ac.jp

Keyword for the subject (キーワード)

Ecophysiology, Food crop, Developmental morphology, Yield determination

Content and Objectives (授業テーマと目的)

(Content)

This course provides a historical trend of crop yields and reviews ecophysiological factors responsible for increasing yield potential during the last century. Approaches for analyzing yield determination are illustrated: 1) ecophysiological viewpoint that deals with the dry matter production and its partitioning, and 2) morphological viewpoint that deals with the formation of yield components. The fundamental ecophysiological process and mechanisms associated with the yield determination, and its environmental responses are discussed. The possibility and strategies for further improvement of crop yield potential will be explored.

(Objectives)

To provide the students with knowledge of ecophysiological processes and mechanisms that associated with the yield determination of major crops. The students will possess a basis for explore the possibility and strategies for further improvement of crop yield potential.

Teaching Materials (教科書・参考書)

Computer projector/Printed synopsis

Evaluation of Results (成績評価の方法)

Report and Attendance

Course Subject Title (授業題目)

Crop production science II

Credits (Units) (単位数)

1

Class Work Type (授業種別)

Lecture

Year of commencement (履修開始年次)

1st year

Semester (履修期間)

Fall term

Day/Period (時間割)

Wednesday/first

Professor (Lecturer or Instructor) (担当教員名)

MOROKUMA Masahiro

Professor (Affiliation/Research Field) (担当教員所属)

Kagawa University/Food production

Professor (Telephone) (担当教員電話)

0879-52-2763

Professor (E-Mail) (担当教員)

morokuma.masahiro@kagawa-u.ac.jp

Keyword for the subject (キーワード)

Rice, Cultivation management, Production system

Content and Objectives (授業テーマと目的)

The purposes of crop production are to make its yield and quality the best. To achieve these purposes, we are systematizing to control crop growth by many cultivation managements. In this lecture, I explain about cultivation managements of paddy rice. And we discuss on crop production from diversified perspectives, and think about systematized production systems. Our aim is to catch many cultivation managements systematically in rice production.

Teaching Materials (教科書・参考書)

Evaluation of Results (成績評価の方法)

Report(70%) and Written test(30%)

Course Subject Title (授業題目)

Propagation and breeding of horticultural resources

Credits (Units) (単位数)

1

Class Work Type (授業種別)

Lecture

Year of commencement (履修開始年次)

2nd year

Semester (履修期間)

Spring term

Day/Period (時間割)

(Contact the lecturer to confirm the availability of the course)

Professor (Lecturer or Instructor) (担当教員名)

TAKAMURA Takejiro

Professor (Affiliation/Research Field) (担当教員所属)

Kagawa University/ Bioresource Production Science

Professor (Telephone) (担当教員電話)

087-891-3074

Professor (E-Mail) (担当教員)

takamura.takejiro@kagawa-u.ac.jp

Keyword for the subject (キーワード)

horticulture, breeding, ploidy, propagation, micropropagation

Content and Objectives (授業テーマと目的)

Explanation of the conventional and recent methods of breeding and propagation of horticultural crops

Teaching Materials (教科書・参考書)

Computer projector

Evaluation of Results (成績評価の方法)

Submitted report at the completion of the course

Course Subject Title (授業題目)

Advanced floricultural science

Credits (Units) (単位数)

1

Class Work Type (授業種別)

Lecture

Year of commencement (履修開始年次)

1st year

Semester (履修期間)

Spring term

Day/Period (時間割)

(Contact the lecturer to confirm the availability of the course)

Professor (Lecturer or Instructor) (担当教員名)

NARUMI Takako

Professor (Affiliation/Research Field) (担当教員所属)

Kagawa University/ Agricultural and Resource Economics/floricultural science

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087-891-3130

Professor (E-Mail) (担当教員)

narumi.takako@kagawa-u.ac.jp

Keyword for the subject (キーワード)

Floriculture, flower production, chrysanthemum, carnation

Content and Objectives (授業テーマと目的)

(Content)

This lecture will explain about history of floriculture, techniques for cut flower production based on flowering physiology, and the present issues.

(Objectives)

The purpose of lecture is to understand history of floriculture, techniques for cut flower production based on flowering physiology, and the present issues.

Teaching Materials (教科書・参考書)

Computer projector/Printed synopsis

Evaluation of Results (成績評価の方法)

Submitted report at the completion of the course

Course Subject (授業題目)

Advanced animal production science I

Credits (Units) (単位数)

1

Class Work Type (授業種別)

Lectures will incorporate active learning, such as group work and facility tours.

Year of commencement (履修開始年次)

1st year

Semester (履修期間)

Spring term

Day/Period (時間割)

Contact the lecturer to confirm the availability of the course

Professor (Lecturer or Instructor) (担当教員名)

MATSUMOTO Yoshiki

Professor (Affiliation/Research Field) (担当教員所属)

Kagawa University/Animal Production Science

Professor (Telephone) (担当教員電話)

087-891-3057

Professor (E-Mail) (担当教員)

matsumoto.yoshiki@kagawa-u.ac.jp

Keyword for the subject (キーワード)

animal production science, Insect feed and food, production guidelines, biological and mechanical transmission of infectious diseases, Salmonella, Campylobacter, Heavy metal contamination, Mold Toxicity.

Content and Objectives (授業テーマと目的)

In recent years, insect production has become a new addition to animal production science. In Japan, sericulture and beekeeping are controlled by the Ministry of Agriculture, Forestry, and Fisheries (MAFF) and are tightly controlled by the government veterinarian in the event of disease outbreaks. Insects as human food safety are controlled by the legislation the Ministry of Health, Labor, and Welfare (MHLF) sets forth. The Ministry of the Environment regulates pet feed safety. This class will learn how insects as livestock feed need to be produced and how MAFF guidelines control feed safety. All students will learn how to properly understand the difference between the biological and mechanical transmission of infectious diseases in feed and food production areas at farms and factories, what kind of damage to livestock and humans exists among contagious diseases that may arise from insect production, and what type of thinking and efforts are needed to prevent the spread of damage to existing animal production and fisheries. Many insect production and utilisation precedents have been reported worldwide in ASEAN and the EU. To deepen understanding of the need to prevent risks in insect production when creating new resource cycles and the need to search for functionality on that basis. To share the latest information on the advantages and disadvantages of new insect production, knowing that using New insect-related products does not necessarily solve the problems of

existing animal production.

Teaching Materials (教科書・参考書)

Textbook

Animal Science(Japanese), Yokendo publisher, ISBN:9784842505831, 2022/03

References

International Platform of Insects for Food and Feed (IPIFF)

<https://ipiff.org/>

Insect food and feed business platform (iBPF)

<http://www.kannousuiken-osaka.or.jp/ibpf/>

Evaluation of Results (成績評価の方法)

A report is required for each attendance, and in-class presentation. Assessment of learning outcomes consistent with the syllabus

Course Subject Title(授業題目)

Agricultural economics

Credits (Units)(単位数)

1

Class Work Type(授業種別)

Lecture

Year of commencement(履修開始年次)

1st year

Semester(履修期間)

Spring term

Day/Period(時間割)

(Contact the lecturer to confirm the availability of the course)

Professor (Lecturer or Instructor)(担当教員名)

MUTO Yukio

Professor (Affiliation/Research Field)(担当教員所属)

Kagawa University/ Agricultural Economics and Management

Professor (Telephone)(担当教員電話)

087-891-3055

Professor (E-Mail)(担当教員)

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Keyword for the subject(キーワード)

Farm Management, Microeconomics, Econometrics

Content and Objectives(授業テーマと目的)

(Content)

This course covers the basic theories of business management, microeconomics, and econometrics, and explains how they can be applied to quantitative analysis in agricultural economics.

(Objectives)

The objective of this lecture is to deepen students' understanding of analytical methods and concepts in agricultural economics. The lecture attempts to foster the ability to conduct academic research using quantitative methods in the field of agricultural economics.

Teaching Materials(教科書・参考書)

Greene, W.H. Econometrics 8th ed. Kay, R.D., Edwards, W. M., and Duffy, P. A.

Farm Management 7th ed.

Evaluation of Results(成績評価の方法)

Attendance and report

Course Subject Title (授業題目)

Agricultural marketing and development

Credits (Units) (単位数)

1

Class Work Type (授業種別)

Lecture

Year of commencement (履修開始年次)

2nd year

Semester (履修期間)

Spring term

Day/Period (時間割)

(Contact the lecturer to confirm the availability of the course)

Professor (Lecturer or Instructor) (担当教員名)

MUTO Yukio

Professor (Affiliation/Research Field) (担当教員所属)

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087-891-3055

Professor (E-Mail) (担当教員)

muto.yukio@kagawa-u.ac.jp

Keyword for the subject (キーワード)

Agricultural Distribution and Marketing, Agricultural Development

Content and Objectives (授業テーマと目的)

(Content)

This lecture provides an overview of the distribution and marketing systems of agricultural products and agricultural development patterns from an international perspective.

(Objectives)

The objective of this course is to provide students with an understanding of effective agricultural distribution and marketing systems and with international patterns of agricultural development.

Teaching Materials (教科書・参考書)

Computer projector/Printed synopsis

Evaluation of Results (成績評価の方法)

Attendance and report

Course Subject Title (授業題目)

Food protein functionalities

Credits (Units) (単位数)

1

Class Work Type (授業種別)

Lecture

Year of commencement (履修開始年次)

1st year

Semester (履修期間)

Spring term

Day/Period (時間割)

(Contact the lecturer to confirm the availability of the course)

Professor (Lecturer or Instructor) (担当教員名)

OGAWA Masahiro

Professor (Affiliation/Research Field) (担当教員所属)

Kagawa University/ Food Protein Functionalities

Professor (Telephone) (担当教員電話)

087-891-3098

Professor (E-Mail) (担当教員)

ogawa.masahiro@kagawa-u.ac.jp

Keyword for the subject (キーワード)

Meat, Seafood, Proteases and their inhibitors, Structure

Content and Objectives (授業テーマと目的)

Comprehending the functions of proteins and understanding the current trends in the application of protein functionalities to food products

Teaching Materials (教科書・参考書)

Computer projector and Printed synopsis

Evaluation of Results (成績評価の方法)

Submitted paper (report) at the completion of the course

Course Subject Title (授業題目)

Molecular nutrition of functional foods

Credits (Units) (単位数)

1

Class Work Type (授業種別)

Lecture

Year of commencement (履修開始年次)

1st year

Semester (履修期間)

Spring term

Day/Period (時間割)

(Contact the lecturer to confirm the availability of the course)

Professor (Lecturer or Instructor) (担当教員名)

YONEKURA Lina

Professor (Affiliation/Research Field) (担当教員所属)

Kagawa University/ Food Chemistry

Professor (Telephone) (担当教員電話)

087-891-3105

Professor (E-Mail) (担当教員)

yonekura.lina@kagawa-u.ac.jp

Keyword for the subject (キーワード)

functional foods, bioactives, bioavailability, clinical trial designs,

Content and Objectives (授業テーマと目的)

Introduction to functional compounds in food ingredients, their bioavailability and molecular mechanisms driving their health benefits.

Teaching Materials (教科書・参考書)

Slide projection, with slide files available for download.

Evaluation of Results (成績評価の方法)

Presentation or submission of a report at the completion of the course

Course Subject Title (授業題目)

Applied enzymology

Credits (Units) (単位数)

1

Class Work Type (授業種別)

Lecture

Year of commencement (履修開始年次)

2nd year

Semester (履修期間)

Fall term

Day/Period (時間割)

Intensive course in the fall term (Contact the lecturer to confirm the availability of the course)

Professor (Lecturer or Instructor) (担当教員名)

WATANABE Akira ・ TAKATA Goro ・ MORIMOTO Kenji ・ YOSHIHARA Akihide

Professor (Affiliation/Research Field) (担当教員所属)

Kagawa University/ Applied Enzymology

Professor (Telephone) (担当教員電話)

087-891-3121(WATANABE Akira)

087-891-3106(TAKATA Goro)

087-891-3292(MORIMOTO Kenji)

087-891-3107(YOSHIHARA Akihide)

Professor (E-Mail) (担当教員)

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takata.goro@kagawa-u.ac.jp

morimoto.kenji@kagawa-u.ac.jp

yoshihara.akihide@kagawa-u.ac.jp

Keyword for the subject (キーワード)

Bacteria, Fungi, Enzymes, Sugars, Genetics

Content and Objectives (授業テーマと目的)

Study on basic and application of enzymology, and understanding of recent development on the utilization of microbes and enzymes such as rare sugar production.

Teaching Materials (教科書・参考書)

Computer projector/Printed synopsis

Evaluation of Results (成績評価の方法)

Submitted paper

Course Subject Title(授業題目)

Processing of agricultural products

Credits (Units)(単位数)

1

Class Work Type(授業種別)

Lecture

Year of commencement(履修開始年次)

1st year

Semester(履修期間)

Spring term

Day/Period(時間割)

(Contact the lecturer to confirm the availability of the course)

Professor (Lecturer or Instructor)(担当教員名)

ISHII Toya

Professor (Affiliation/Research Field)(担当教員所属)

Kagawa University/ Food Processing

Professor (Telephone)(担当教員電話)

087-891-3103

Professor (E-Mail)(担当教員)

ishii.toya@kagawa-u.ac.jp

Keyword for the subject(キーワード)

Food processing, Proteins, Polysaccharides, Lipids

Content and Objectives(授業テーマと目的)

Post-harvest processing of agricultural products to produce food ingredients and final products in the food industry

Teaching Materials(教科書・参考書)

Distributed prints

Evaluation of Results(成績評価の方法)

The mini reports after each session and the final report

Course Subject Title (授業題目)

Bioorganic chemistry

Credits (Units) (単位数)

1

Class Work Type (授業種別)

Lecture

Year of commencement (履修開始年次)

1st year

Semester (履修期間)

Fall term

Day/Period (時間割)

Intensive course in the fall term (Contact the lecturer to confirm the availability of the course)

Professor (Lecturer or Instructor) (担当教員名)

YANAGITA Ryo

Professor (Affiliation/Research Field) (担当教員所属)

Kagawa University/ Chemical Biology

Professor (Telephone) (担当教員電話)

087-891-3092

Professor (E-Mail) (担当教員)

yanagita.ryo@kagawa-u.ac.jp

Keyword for the subject (キーワード)

Bioactive substance, Organic synthesis, Natural product chemistry, Structure–activity relationship

Content and Objectives (授業テーマと目的)

Introduction to the basic knowledge of synthesis and analog design of bioactive natural products

Teaching Materials (教科書・参考書)

Computer projector / Printed synopsis

Evaluation of Results (成績評価の方法)

Submitted paper (report) during and end of the course.

Course Subject Title (授業題目)

Plant nutrition

Credits (Units) (単位数)

1

Class Work Type (授業種別)

Lecture

Year of commencement (履修開始年次)

1st year

Semester (履修期間)

Spring term

Day/Period (時間割)

(Contact the lecturer to confirm the availability of the course)

Professor (Lecturer or Instructor) (担当教員名)

NOMURA Mika

Professor (Affiliation/Research Field) (担当教員所属)

Kagawa University/ Molecular Plant Nutrition

Professor (Telephone) (担当教員電話)

087-891-3135(Nomura Mika)

Professor (E-Mail) (担当教員)

nomura.mika@kagawa-u.ac.jp

Keyword for the subject (キーワード)

Plant Nutrition, Nitrogen fixation, Plant-microbe interaction, Rhizobia

Content and Objectives (授業テーマと目的)

This class is directed to understand basic knowledge and advanced information of plant nutrition.

Current topics and research topics in plant nutrition will be introduced.

Teaching Materials (教科書・参考書)

All materials will be supplied as printed synopsis and will be presented using computer projector.

Evaluation of Results (成績評価の方法)

Evaluation will be done by written test or checking student reports

Course Subject Title (授業題目)

Advanced wood biomass chemistry and tree biochemistry

Credits (Units) (単位数)

1

Class Work Type (授業種別)

Lecture

Year of commencement (履修開始年次)

1st year

Semester (履修期間)

Fall term

Day/Period (時間割)

(Contact the lecturer to confirm the availability of the course)

Professor (Lecturer or Instructor) (担当教員名)

SUZUKI Toshisada

Professor (Affiliation/Research Field) (担当教員所属)

Kagawa University/ Biomass Chemistry

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087-891-3089

Professor (E-Mail) (担当教員)

suzuki.toshisada@kagawa-u.ac.jp

Keyword for the subject (キーワード)

Chemical structure and biosynthesis, Lignin, Lignan, Suberin, Woody biomass utilization

Content and Objectives (授業テーマと目的)

Effective utilization of biomass is important for human beings to control global warming and to achieve sustainable development. Major biomass is woody biomass. Lecture items are as follows: Characteristics of biomass; chemistry (structure, properties, reaction, and utilization) and biochemistry (biosynthesis and biodegradation) of wood biomass components (cellulose, hemicellulose, lignin, and extractives); Utilization of woody biomass (pulp and paper, bioenergy, and biological activity of extractives). These are also important to keep environment by forest.

Teaching Materials (教科書・参考書)

Computer projector/OHP/Printed synopsis

Evaluation of Results (成績評価の方法)

Submitted paper (report) at the completion of the course

Course Subject Title(授業題目)

Bioactive natural products chemistry

Credits (Units)(単位数)

1

Class Work Type(授業種別)

Lecture

Year of commencement(履修開始年次)

2nd year

Semester(履修期間)

Spring term

Day/Period(時間割)

Contact the lecturer to confirm the availability of the course

Professor (Lecturer or Instructor)(担当教員名)

SATO Masashi

Professor (Affiliation/Research Field)(担当教員所属)

Kagawa University/Biological Molecular Chemistry

Professor (Telephone)(担当教員電話)

087-891-3090

Professor (E-Mail)(担当教員)

sato.masashi@kagawa-u.ac.jp

Keyword for the subject(キーワード)

natural product, medicine, pesticide

Content and Objectives(授業テーマと目的)

This class will focus on (1) biological activities (physiological functions) of natural products (naturally occurring organic compounds) and (2) drug- and pesticide development from natural products and their applications.

Teaching Materials(教科書・参考書)

N/A

Evaluation of Results(成績評価の方法)

Your grade will be based on attendance, attitude in class, and short reports.

Course Subject Title (授業題目)

Biomolecules: Basics and recent developments

Credits (Units) (単位数)

1

Class Work Type (授業種別)

Lecture

Year of commencement (履修開始年次)

1st year

Semester (履修期間)

Fall term

Day/Period (時間割)

Contact the lecturer to confirm the availability of the course

Professor (Lecturer or Instructor) (担当教員名)

KONG Lingbing

Professor (Affiliation/Research Field) (担当教員所属)

Kagawa University/Rare sugar organic chemistry and chemical biology.

Professor (Telephone) (担当教員電話)

089-871-3081

Professor (E-Mail) (担当教員)

kong.lingbing@kagawa-u.ac.jp

Keyword for the subject (キーワード)

Biomolecules, nucleic acid, protein, sugar, lipid.

Content and Objectives (授業テーマと目的)

In this course, you will first learn the basics of typical biomolecules that include nucleic acids, carbohydrates, proteins and lipids. Then you will be introduced to some of the most recent developments of these biomolecules and their applications. You will learn the basic English vocabulary and expressions in these fields. In addition, you will have hand-on exercises (for face-to-face lectures only). In the end, you will get engaged in interactive activities and/or group discussions that enable you to deepen your understandings of these molecules and some useful analytical techniques. This course will be in English only.

Teaching Materials (教科書・参考書)

- -J Jones, "Amino Acid and Peptide Synthesis", (Oxford Chemistry Primer), Oxford Scientific, 1984.
- -N Sewald, H-D Jakubke, "Peptides: Chemistry and Biology", Wiley, 2009.
- -D L Nelson, M M Cox, Lehninger Principles of Biochemistry, 4th Edn., Worth, New York, 2005.

Evaluation of Results (成績評価の方法)

Your final grade will be determined based on attendance, performance in class, and completion of assignments.

Course Subject Title(授業題目)

Molecular and cellular biology

Credits (Units)(単位数)

1

Class Work Type(授業種別)

Lecture

Year of commencement(履修開始年次)

1st year

Semester(履修期間)

Fall term

Day/Period(時間割)

(Contact the lecturer to confirm the availability of the course)

Professor (Lecturer or Instructor)(担当教員名)

TABUCHI Mitsuaki

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Keyword for the subject(キーワード)

Molecular and Cellular Biology, Genome editing technology, Yeast Genetics

Content and Objectives(授業テーマと目的)

(Content)

Since the end of last century, life science research field has had explosive advances, such as represented by mapping of human genome, discovery of RNA interference, live cell imaging with fluorescent proteins, and development of ES and iPS cells, etc. Accordingly, it makes difficult for us to make comprehensive understanding of this research field. In this class, we will discuss recent advanced technologies and applications of the molecular cell biology.

(Objectives)

This course aims that students will be able to understand the position and role of their research in the field of molecular and cellular biology and to explain the significance of research to others who are unfamiliar with that field in simple words.

Teaching Materials(教科書・参考書)

Computer projector/printed synopsis

Evaluation of Results(成績評価の方法)

Attendance, class participation and report

Course Subject Title (授業題目)

Applied microbiology

Credits (Units) (単位数)

1

Class Work Type (授業種別)

Lecture

Year of commencement (履修開始年次)

1st year

Semester (履修期間)

Fall term

Day/Period (時間割)

(Contact the lecturer to confirm the availability of the course)

Professor (Lecturer or Instructor) (担当教員名)

TANAKA Naotaka

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Keyword for the subject (キーワード)

Applied Microbiology

Content and Objectives (授業テーマと目的)

(Content)

The industries that apply the functions of microorganisms are not limited to food but also include chemical and pharmaceutical raw materials, environmental purification, and power generation. We will discuss how the functions of microorganisms have been developed and used in various fields and their potential and problems as applied technologies. This lecture will cover various themes related to the functions and applications of microorganisms that have recently received attention. Students are required to research their chosen topic and make a presentation using PowerPoint. Students will ask questions and deepen their understanding of the topic.

(Objectives)

- To understand the functions of microorganisms being developed in various industries.
- To discuss the future of research and development in applying microbial functions and challenges in the industry.

Teaching Materials (教科書・参考書)

A review of each topic will be distributed as appropriate.

Evaluation of Results (成績評価の方法)

Class participation and report

Course Subject Title(授業題目)

Animal cell biology

Credits (Units)(単位数)

1

Class Work Type(授業種別)

Lecture

Year of commencement(履修開始年次)

1st year

Semester(履修期間)

Spring term

Day/Period(時間割)

(Contact the lecturer to confirm the availability of the course)

Professor (Lecturer or Instructor)(担当教員名)

SUGIYAMA Yasunori ・SUEYOSHI Noriyuki

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Keyword for the subject(キーワード)

Basic life phenomenon , Research technology

Content and Objectives(授業テーマと目的)

(Content)

Recently, the need for research using mammals and mammalian cells has increased due to the development of production techniques for genetically modified mouse and cell engineering techniques. With the rapid progress of life sciences, it is essential to understand the basic knowledge in each scientific field. In this lecture, each student lectures on a basic life phenomenon or research technology in your research field. We aim to share a wide range of knowledge by discussing the contents.

(Objectives)

Students will understand the basic knowledge in each scientific field and the analytical techniques. Also, the students will be able to explain the knowledge of the each scientific field or technology to others in an easy-to-understand manner. In addition, the students understand a wide range of knowledge and skills.

Teaching Materials(教科書・参考書)

Basically, we do not use textbooks. If students need the information, you obtain the information from reference books (for example, Molecular Biology of the CELL) and papers.

Evaluation of Results(成績評価の方法)

Attendance and class participation / Presentation, count and quality of question, attendance

Course Subject Title (授業題目)

Molecular plant stress response II

Credits (Units) (単位数)

1

Class Work Type (授業種別)

Lecture

Year of commencement (履修開始年次)

1st year

Semester (履修期間)

Spring term

Day/Period (時間割)

(Contact the lecturer to confirm the availability of the course)

Professor (Lecturer or Instructor) (担当教員名)

ICHIMURA Kazuya

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Keyword for the subject (キーワード)

Plant biotic and abiotic stresses, Plant immunity, Molecular Plant Pathology,
Plant immune responses

Content and Objectives (授業テーマと目的)

(Content)

Environmental stresses in plants are classified into two categories, biotic and abiotic stresses. Signal transduction induced by the recognition of pathogen molecules regulates downstream biotic stress response. Signal transduction consists of molecular recognition inside and outside the cell, intracellular signaling, and downstream responses. To acquire knowledge about plant immunity important for master's research, we learn molecular mechanisms of signal transduction in plant immunity, molecular plant-pathogen interactions, and virulence strategies of pathogen effectors in this special lecture. A mini-examination will be given at the end of every lecture to assess students' achievement.

(Objectives)

In this course, students will expand their knowledge in plant immunity, one of the most active area of plant environmental stresses. In particular, this course aims to acquire knowledge to perform advanced master's research, including methods using mutants and genetically modified plants, extensive gene expression analysis at the genome level, and hormone responses that are closely related to plant immunity.

Teaching Materials (教科書・参考書)

Teaching tools in Plant Biology, Fighting for their lives: Plants and pathogens
(www.plantcell.org/cgi/doi/10.1105/tpc.112.tt0612)

Peter N. Dodds and John P. Rathjen, Plant immunity: towards an integrated view of plant-pathogen interactions. *Nature Reviews in Genetics*, 11:539 - 548, 2010.

Evaluation of Results (成績評価の方法)

Attendance and written test

Course Subject Title(授業題目)

Microbial and plant metabolism

Credits (Units)(単位数)

1

Class Work Type(授業種別)

Lecture

Year of commencement(履修開始年次)

1st year

Semester(履修期間)

Spring term

Day/Period(時間割)

Contact the lecturer to confirm the availability of the course

Professor (Lecturer or Instructor)(担当教員名)

MOCHIZUKI Susumu

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Keyword for the subject(キーワード)

Microbial metabolism, Plant metabolism, Primary metabolites, Secondary metabolites

Content and Objectives(授業テーマと目的)

Microbes and plants produce a variety of metabolites throughout their life cycles. Many of these compounds are beneficial to be used for human and are important in the fields of medicine and food. In this lecture, an overview of biological metabolism will be introduced, focusing on "primary metabolism (sugar production) in plants" and "secondary metabolism (antibiotic synthesis) in microorganisms," two representative topics in the metabolism and metabolites of organisms.

Teaching Materials(教科書・参考書)

Computer projector or Printed synopsis

Evaluation of Results(成績評価の方法)

Written examination or Submitted paper (report)

Course Subject Title(授業題目)

Bacterial biochemistry

Credits (Units)(単位数)

1

Class Work Type(授業種別)

Lecture

Year of commencement(履修開始年次)

2nd year

Semester(履修期間)

Fall term

Day/Period(時間割)

(Contact the lecturer to confirm the availability of the course)

Professor (Lecturer or Instructor)(担当教員名)

KATO Shiro

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Keyword for the subject(キーワード)

Bacteria, Enzymology, D-Amino acid, Peptidoglycan

Content and Objectives(授業テーマと目的)

Introduction to the basic knowledge of enzymes related to non-proteinogenic amino acid metabolism.

Teaching Materials(教科書・参考書)

Computer projector / Printed synopsis

Evaluation of Results(成績評価の方法)

Submitted paper (report) at the completion of the course

Course Subject Title (授業題目)

Molecular plant breeding

Credits (Units) (単位数)

1

Class Work Type (授業種別)

Lecture

Year of commencement (履修開始年次)

1st year

Semester (履修期間)

Fall term

Day/Period (時間割)

(Contact the lecturer to confirm the availability of the course)

Professor (Lecturer or Instructor) (担当教員名)

SUGITA-KONISHI, Saeko

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087-891-3136

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sugita.saeko@kagawa-u.ac.jp

Keyword for the subject (キーワード)

Plant Breeding, Crop, Rice

Content and Objectives (授業テーマと目的)

In this lecture, we will discuss recent important topics in genetic and breeding studies on important traits of rice and other useful crops such as wheat and barley.

This lecture will focus on the functional analysis of important genes isolated from crops and the results obtained through comparative genome analysis among various plants. The lecture will also cover recent genetic engineering techniques and their applications. The objective is to understand the basis of molecular mechanisms that determine important traits in plants and recent scientific technologies in the field of life sciences.

Teaching Materials (教科書・参考書)

Textbook: Not used. The students will be introduced to related literature and will be expected to make use of online journals.

Reference book:

"What can we do with rice genome sequencing", Masahiro Yano and Makoto Matsuoka (eds.), Noubunkyo, 2,800 yen

"Rice Science Compendium" (Volumes 1-3), Takamine Matsuo et al. (eds.), Noubunkyo, 15,000-18,000 yen each.

Genetics and Breeding of Plants (2nd edition)", Kiichi Fukui et al, Asakura Shoten, 2013 yen

Evaluation of Results (成績評価の方法)

The evaluation will be based on the results of the presentation (including Q&A) (60%) and the results of the submission of reports and other assignments (40%). Grades will be based on the degree of achievement of the achievement objectives as follows.

Excellent (90 points or more and up to 100 points):

The student has achieved the attainment target at an extremely high level.

Excellent (80 points or more but less than 90 points):

Achievement of the achievement target is high.

Good (70 points or more but less than 80 points):

The achievement target is attained at a standard level.

Acceptable (60 to less than 70 points):

The achievement objective is attained at a minimum level.

Not acceptable (less than 60 points):

The achievement target is not achieved.

Course Subject Title(授業題目)

Material cycles and biological processes in the shallow coastal water environment

Credits (Units)(単位数)

1

Class Work Type(授業種別)

Lecture

Year of commencement(履修開始年次)

1st year

Semester(履修期間)

Fall term

Day/Period(時間割)

(Contact the lecturer to confirm the availability of the course)

Professor (Lecturer or Instructor)(担当教員名)

YAMAGUCHI Hitomi

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Keyword for the subject(キーワード)

Biophilic elements, Coastal ecosystem, Primary production, Nutrients

Content and Objectives(授業テーマと目的)

Introduction of material cycles and biological processes in the shallow coastal water environment

Teaching Materials(教科書・参考書)

Computer projector or Printed synopsis

Evaluation of Results(成績評価の方法)

Written examination or Submitted paper (report)

Course Subject Title (授業題目)

Limnology

Credits (Units) (単位数)

1

Class Work Type (授業種別)

Lecture

Year of commencement (履修開始年次)

2nd year

Semester (履修期間)

Spring term

Day/Period (時間割)

(Contact the lecturer to confirm the availability of the course)

Professor (Lecturer or Instructor) (担当教員名)

YAMADA Yoshihiro

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Keyword for the subject (キーワード)

Lake, River, Carbon, Nitrogen, Isotope

Content and Objectives (授業テーマと目的)

Introduction to the cycle of carbon, nitrogen, phosphorus and some major elements in waters.

Study on the physical, chemical and biological process in the lake and river.

Teaching Materials (教科書・参考書)

Computer projector or Printed synopsis

Evaluation of Results (成績評価の方法)

Written test or Submitted report at the completion of the course.

Course Subject Title(授業題目)

Behavior of biophilic elements in the marine environment

Credits (Units)(単位数)

1

Class Work Type(授業種別)

Lecture

Year of commencement(履修開始年次)

1st year

Semester(履修期間)

Fall term

Day/Period(時間割)

(Contact the lecturer to confirm the availability of the course)

Professor (Lecturer or Instructor)(担当教員名)

ICHIMI Kazuhiko

Professor (Affiliation/Research Field)(担当教員所属)

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Keyword for the subject(キーワード)

biophilic elements, nutrient, coastal ocean, lower trophic level

Content and Objectives(授業テーマと目的)

The behavior of biophilic elements at the lower trophic level in the coastal ocean, where organism deeply concerns will be explained from the aspects of biology and chemistry.

Teaching Materials(教科書・参考書)

Computer projector or Printed synopsis

Evaluation of Results(成績評価の方法)

Written examination or Submitted paper (report)

Course Subject Title(授業題目)

Evolutionary ecology

Credits (Units)(単位数)

1

Class Work Type(授業種別)

Lecture

Year of commencement(履修開始年次)

1st year

Semester(履修期間)

Fall term

Day/Period(時間割)

(Contact the lecturer to confirm the availability of the course)

Professor (Lecturer or Instructor)(担当教員名)

YASUI Yukio

Professor (Affiliation/Research Field)(担当教員所属)

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Keyword for the subject(キーワード)

evolution, adaptation, natural selection, insect behavior, evolutionary theory

Content and Objectives(授業テーマと目的)

(Content)

Evolution is the sole principle unifying the entire biology. The evolutionary thinking is also needed to understand various ecological and environmental problems in the present world. In this lecture, I introduce the basic (or sometimes advanced) evolutionary theory to explain reproductive and surviving strategies of organisms.

(Objectives)

To understand the reasons why organisms are so diverse and adaptive (well lived).

Teaching Materials(教科書・参考書)

Mark Ridley (2004) "Evolution" 3rd Ed. Blackwell

Evaluation of Results(成績評価の方法)

Report

Course Subject Title(授業題目)

Plants in ecological systems

Credits (Units)(単位数)

1

Class Work Type(授業種別)

Lecture

Year of commencement(履修開始年次)

1st year

Semester(履修期間)

Fall term

Day/Period(時間割)

(Contact the lecturer to confirm the availability of the course)

Professor (Lecturer or Instructor)(担当教員名)

KOBAYASHI,Tsuyoshi

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Keyword for the subject(キーワード)

plant ecology, invasive plants, forest ecosystems

Content and Objectives(授業テーマと目的)

Studies for suitable plant management and ecosystem conservation under human activity

- Overview on forest ecosystems and roles of plants in those systems

- Life-history traits of invasive organisms in Japanese secondary forests

- Effects of giant bamboos and consideration of ecosystem management on rural area in Kagawa

Teaching Materials(教科書・参考書)

unspecified (some of materials will be distributed in the lecture)

Evaluation of Results(成績評価の方法)

attendance to the lecture, submission of report paper