

M05 Advanced Technology in Agriculture

Course Outline

This course focuses on biotechnology and environmental technology, a field that has developed quickly. Each lecture covers molecular and cellular biology with the recent hot topics of genetics & biotechnology, plant biology, developmental biology and environmental technology. Evaluation will be done based on class attendance, performance, writing assignment and midterm exams. Part of lectures are progressed with a textbook "Essential Cell Biology – Third Edition" accompanies our lectures. Students are supposed to get it prior to the course. Our library has the book as well.

Qualifications

Graduate students and research students

Period

Fall semester, 2011 (From Nov. 14 to Dec. 8) 13:00-14:30

Classroom

21st Century Plaza Lecture Room 2

(No. 55 in <http://www.kyushu-u.ac.jp/access/map/hakozaki/hakozaki-e.html>)

Reference book

Textbook Name; *Essential Cell Biology --- Third Edition*

Authors; Bruce Alberts, Dennis Bray, Karen Hopkin, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, and Peter Walter

Publisher; Garland Science, Taylor & Francis Group

ISBN-13; 978-0815341291

Contact information

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Lecture Keywords

Lectures 1-4

Genetic information, Gene expression, Genetic manipulation, Bacteria, Virulence, Genomics, Natural variation, DNA marker and marker-assisted selection

Lectures 5-7

Energy generation in mitochondria and chloroplasts, Transporters on biomembrane

Lectures 8-11

Freshwater fish, Behavior, Mathematical model, Zebrafish development, Tissue and cell differentiation

Lectures 12-15

Forest, Leaf ecophysiology, Hydrology, Sociology, economics, Forestry

Lecture schedule

| LECT.# | DATE | INSTRUCTOR | TOPIC | ACTIVITIES | ITEM DUE |
|--------------------------------------|----------------|------------|---|-------------------------------------|----------------------------------|
| Part 1: Genetics and Biotechnology | | | | | |
| 1 | Nov. 14 Mon | Doi, | Overview of the Lecture, Basic of Genetic information | Lecture, Quiz & Think-pair-share | Student Response System (SRS) |
| 2 | Nov. 15 Tue | Doi | Control of Gene expression | Lecture, Quiz & Discussion | SRS |
| 3 | Nov. 16 Wed | Iiyama | Recombinant DNA Technology and Applications | | |
| 4 | Nov. 17 Thu | Yamagata | Genomic breeding | | |
| Part 2: Plant science and Technology | | | | | |
| 5 | Nov. 24 Thu | Yuasa | Respiration in mitochondria | Lecture & Discussion | |
| 6 | Nov.25 Fri | Yuasa | Photosynthesis in chloroplast | Lecture & Discussion | |
| 7 | Nov.28 Mon | Yuasa | Ion transport and channels | Lecture & Discussion | |
| Part 3: Development & Behavior | | | | | |
| 8 | Nov.29 Tue | Nakamura | Animal Cell Biology | Lecture & Discussion | |
| 9 | Nov.30 Wed | Nakamura | Animal Cell Biology | Lecture & Discussion | |
| 10 | Dec.1 Thu | Fukuda | Toxic behavior of freshwater fish | Lecture & Discussion | |

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| 11 | Dec.2 Fri | Fukuda | Fish behavior and ecological models | Lecture & Discussion | |
| Part 4: Environment & Ecology | | | | | |
| 12 | Dec.5 Mon | Miyazawa | Leaf ecophysiology for woody species | Lecture & Discussion | |
| 13 | Dec.6 Tue | Komatsu | Forest hydrology and meteorology | Lecture & Discussion | |
| 14 | Dec. 7 Wed | Kawasaki | Forestry & Socioeconomy | Lecture & Discussion | |
| 15 | Dec. 8 Thu | Kawasaki | Forestry & Socioeconomy | Lecture & Discussion | |
| EXTRA | | | | Field trip | Under consideration |