

The Hong Kong University of Science and Technology

Division of Life Science

LIFS 4150 Plant Biotechnology

Fall semester, 2017/18

Credits: 3 (2 lectures + 1 tutorial)

Pre-requisites: LIFS 2210 or LIFS 2040, and LIFS 3140

Course coordinator: Prof. Ning Li

Instructors: Prof. Ning Li, Dr Melody Leung

Course goals

This course introduces current status and future potential of plant biotechnology with emphasis on the fundamentals of plant molecular biology, proteomics and biotechnology. Using examples of marketable products from food industry, agriculture, and TCM medicines, the role of basic research in the development of biotechnology products will be discussed. Students are expected to proactively participate in the class discussion about biotechnological principles and advancement in tutorial sessions throughout the semester. At the end of the course, students will be asked to form groups to present an innovative plant biotechnology proposal, which integrates the knowledge learnt from class and literature and translate them into the industrial and business application.

Assessment scheme

<u>Components</u>	<u>Percentage</u>
A. Mid-term Examination	40
B. Final Examination	40
C. Tutorials	10
D. Group Presentation	10

Teaching Schedule

Monday	1500-1550	Rm2302
Wednesday	1500-1550	Rm2302
Friday	1500-1550	Rm2302

Date	Topic	Instructor
Week 1 Sept 4, 6, 8	<i>Inducible promoters and agrobacterium-mediated DNA transfer</i>	Li
Week2 Sept 11, 13, 15	<i>Genetic engineering of herbicide-tolerant crops/ cotton fiber</i>	Li
Week 3 Sept 18, 20, 22	<i>Flower Biotechnology</i>	Li
Week 4 Sept 25, 27, 29	<i>Medicinal plants and algae and natural drug molecules</i>	Leung
Week 5 Oct 4, 6	Single cell culture, suspension culture of medicinal plant organs in fermentor	Leung
Week 6 Oct 9, 11, 13	Production of secondary metabolites and drugs in plants	Leung
Week 7 Oct 16, 18, 20	<i>TCM molecules</i> identification, extraction and bio-assay	Leung
Week 8 Oct 23, 25	Review and Midterm exam	Leung
Week 9 Oct 30, Nov 1, 3	<i>Genetic engineering of fruits</i>	Li
Week 10 Nov 6, 8, 10	<i>Genetic engineering stress-tolerant crops</i>	Li
Week 11 Nov 13, 15, 17	<i>Genetic engineering plants for bioenergy industry</i>	Li
Week 12 Nov 20, 22, 24	<i>Quantitative PTM proteomics in agriculture and medicine</i>	Li
Week 13 Nov 27, 29	Group Presentations	Li
To be Confirmed	Final Examination	Li