

The Hong Kong University of Science and Technology

Division of Life Science

LIFS 4150 Plant Biotechnology

Fall semester, 2018/19

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/Tutorial Schedule

Monday	0930-1020	Rm2407
Wednesday	0930-1020	Rm2407
Friday (Tutorial)	0930-1020	Rm2407

Date	Topic	Instructor
Week 1 Sept 3, 5, 7	<i>Inducible promoters and agrobacterium-mediated DNA transfer</i>	Li
Week2 Sept 10, 12, 14	<i>Genetic engineering of herbicide-tolerant crops/ cotton fiber</i>	Li
Week 3 Sept 17, 19, 21	<i>Flower Biotechnology</i>	Li
Week 4 Sept 24, 26, 28	<i>Medicinal plants and algae and natural drug molecules</i>	Leung
Week 5 Oct 3, 5	<i>Single cell culture, suspension culture of medicinal plant organs in fermentor</i>	Leung
Week 6 Oct 8, 10, 12	<i>Production of secondary metabolites and drugs in plants</i>	Leung
Week 7 Oct 15, 19	<i>TCM molecules identification, extraction and bio-assay</i>	Leung
Week 8 Oct 22, 24	Review and Midterm exam	Li / Leung
Week 9 Oct 29, 31 Nov 2	<i>Genetic engineering of fruits</i>	Li
Week 10 Nov 5, 7, 9	<i>Genetic engineering stress-tolerant crops</i>	Li
Week 11 Nov 12, 14, 16	<i>Genetic engineering plants for bioenergy industry</i>	Li
Week 12 Nov 19, 21, 23	<i>Quantitative PTM proteomics in agriculture and medicine</i>	Li
Week 13 Nov 26, 28, 30	Group Presentations	Li
To be Confirmed	Final Examination	Li