

# MASTER'S PROGRAM FOR INTERNATIONAL STUDENTS IN BIOTECHNOLOGY

## Introduction

The Graduate Institute of Biotechnology at Chinese Culture University is the first established graduate program in biotechnology in Taiwan and has a long and distinguished tradition of excellence in graduate education. The international master program in agricultural biotechnology is jointly offered by several departments in the college of agriculture, in collaboration with the college of science and college of engineering.

## Mission Statement

Our goal is to train international graduate students with the theoretical knowledge and technical skills required by agricultural biotechnology. Students will be provided with information regarding developments in international agricultural biotechnology and have opportunities to learn from Taiwan's experiences.

## Admission

### Eligible Applicants:

International applicants are required to hold a valid, ROC-recognized bachelor's degree, or its equivalent. Furthermore, the international applicants have to satisfy all applicable requirements stated in the CCU Regulations for International Admission.

### Criteria for Admission:

The international master program requires applicants to provide school transcript(s) (including proofs of outstanding academic achievements). The applicants have to submit one copy of English or Chinese Master Research Plan (including a statement describing the applicant's Chinese language ability). Applicants are encouraged to attach work experience or published research papers related to biotechnology to the application package.

## Program Structure

Students in this program should either have taken an undergraduate level biochemistry course or complete a biochemistry course before his/her graduation. A special designed study plan equivalent to a biochemistry course can be arranged by the institute if the prerequisite course is

not available in English. Each student in this program must complete 30 credits, including all required courses and some elective courses. Students must achieve TOFEL IBT score of 74 or above, or pass any equivalent exam before the thesis oral exam can be arranged. A written master thesis is required for the degree. Upon completing the English requirement, required courses and research project, students may apply for the thesis oral exam.

### Required Courses

Course	Unit	Course Description
Seminar in Biotechnology	4 credits	A review of biotechnology literature that will set the foundation for students' theses research.
Current Topics on Biotechnology	3 credits	The purpose of this course is to enhance the basic knowledge of the students by introducing up-to-date special topics in biotechnology.

### Elective Courses

Course	Unit	Course Description
Research Techniques in Biotechnology	2credits	This course introduces principles and applications in biotechnology. Emphasis is on basic concepts, experimental design, and research strategies used in agricultural and biological research.
Advanced Molecular Biology	3 credits	The course focuses on understanding how issues in the molecular biology of genes and genomes are resolved. Sections of this course include gene and genome structure, transcription, translation and DNA replication.
Applied Microbiology	3 credits	The utilization of microorganisms to improve the welfare of human kind is the core of applied microbiology. The applications of microorganisms in agriculture, the medical industry, and the environment are discussed.
Applied Immunology	3 credits	The course discusses the research of necessary diagnostic tools, symptomatic treatment medicines, and preventative treatment vaccines pertaining to biotech practices and info tech solutions.
Proteomics	3 credits	The purpose of this course is to provide students with the basic knowledge of proteomics to attract their attention to this new technology and its application!
Enzyme Technology	2 credits	This course starts with the basics of enzymology and follows the

		applications of enzymes in an industrial and medical context. Approaches to enzyme modification are also discussed.
<b>Biotechnology Industry</b>	<b>2 credits</b>	This course introduces the prosecution of a patent application in Taiwan Patent and Trademark Office. Course also includes real case studies on the pharmaceutical, biotechnology, and medical device patent applications.
<b>Advanced Genetics</b>	<b>3 credits</b>	The purposes of this course are to learn the principles and concepts of genetics as an inter-discipline of biological science, and to realize the links between genetics and your research project.
<b>Gene Cloning Techniques</b>	<b>2 credits</b>	This course is designed to explore the biotechnology surrounding modern research approaches. This course will help students understand where to begin in planning molecular research, how much information is enough, and what type of data is the most supportable.
<b>Advanced Cell Physiology</b>	<b>3 credits</b>	This course is designed to study animal physiology and plant physiology at cellular level. In this course, animal and plant cells structure and their physiological functions at molecular level, as well as cell-cell interaction, are introduced.
<b>Bioinformatics</b>	<b>3 credits</b>	In this course, we will learn to use computer tools to store, access, and analyze nucleic acid and amino acid sequence data and protein structural data and understand the bioinformatics analyzing methods, predictive methods and computer modeling through public web-browser or software.
<b>Genomics</b>	<b>3 credits</b>	This course provides an introduction to the fundamental concepts of genetics and genomics, an inside look at the Human Genome Project, bioinformatic and experimental techniques for large-scale genomic studies.
<b>Endocrinology</b>	<b>2 credits</b>	This course is designed to introduce the basic in endocrinology including chemical structure, research methods, synthesis and secretion, mode of actions, signal transductions, receptor chemistry and hormone functions.
<b>Molecular Breeding</b>	<b>2 credits</b>	The purposes of this course are to learn the basic concepts, principles, techniques and methodology of plant molecular breeding, and to realize the links between molecular breeding and your research project.
<b>Advanced Biostatistics</b>	<b>2 credits</b>	The purposes of this course are to transmit concepts of biostatistics in sufficient detail, to provide the background for more advanced training in specialized areas, and to realize the links between biostatistics and our

		daily life.
<b>Neurochemistry</b>	<b>2 credits</b>	The course aims at an essentials level introductory general neuroscience. The course provides an introduction to the neuron, gene, physiology, anatomy, and biotechnology for diseases.
<b>Tissue Engineering and Regeneration Medicine</b>	<b>2 credits</b>	The goal of the course is to teach the techniques and applications of stem cells. The translational research in regenerative medicine, biomaterials and tissue engineering will be discussed.

## FACULTY

Professor	Position	Educational Background
Dr. Shu-Yin Wang	Professor and Head	Ph.D., Cornell University (USA)
Dr. Wen-Chi Tsai	Professor	Ph.D., Imperial College London
Dr. Kuan-Hung Lin	Professor	Ph.D., Texas A&M University (USA)
Dr. Chun- Fan Chang	Associate Professor	Ph.D., University of Thomas Jefferson (USA)
Dr. Chiu-Jung Huang	Associate Professor	Ph.D., National Yang-Ming University
Dr. Chien-Cheng Hsieh	Associate Professor	Ph.D., National Defense Medical Center
Dr. Po-Jung Chien	Associate Professor	Ph.D., National Taiwan University
Dr. Tzann- Shun Hwang	Assistant Professor	Ph.D., National Taiwan University
Dr. Ming-Chang Chiang	Assistant Professor	Ph.D., National Yang-Ming University
Dr. Li-Ru Chen	Assistant Professor	Ph.D., National Tsing- Hua University
Dr. Min Liu	Assistant Professor	Ph.D., University of California Berkeley (USA)
Dr. Semon Wu	Assistant Professor	Ph.D., Chang Gung University
Dr. Yi-Ping Yu	Assistant Professor	Ph.D., National Defense Medical Center

### Contact Information

Dr. Shu-Yin Wang

Email: [sywang@faculty.pccu.edu.tw](mailto:sywang@faculty.pccu.edu.tw)

Tel: +886-2-28610511 Ext. 31801