

# Agricultural Biology

## Programmes

Master of Plant Biology Conservation and Breeding

Master of Biotechnology

M.Sc. in Plant Biology Conservation and Breeding

M.Sc. in Biotechnology

Master of Philosophy (M.Phil.)

Doctor of Philosophy (Ph.D.)

## About the Board of Study

The Board of Study (BS) in Agricultural Biology is the only Board which caters to the need of producing postgraduate degree in Biological Sciences since the establishment of the PGIA in 1975. Presently, the BS offers postgraduate degrees in the areas of Biology, Biodiversity, Genetics, Plant Breeding and Biotechnology giving a strong exposure to current developments in these fields. The BS concentrates on research and outreach projects that conform to the national and international requirements. The Board has collaborations with the Department of Agriculture and many other national research institutes in the country to foster partnerships to strengthen the postgraduate education in related disciplines. The BS disseminates knowledge, developing skills and attitudes of postgraduate students to enhance the efficiency of agro-based industries towards self sufficiency while minimizing the environmental impact. Furthermore, the Board undertakes cutting-edge research through national and international grants providing opportunities for research students to acquire laboratory skills at the state of art laboratories and research fields conducted at national research institutes secured through collaborations. The Board also conduct various short courses, workshops and training programmes in the fields of Biology and Biotechnology.

## Current Research

- Morphological and molecular characterization of plants and microorganisms
- Genetic improvement of rice, tomato, chilli and other economically important crops
- Gene and QTL mapping
- Genome-wide expression analysis for stress response genes in rice
- Assembly of gene regulatory networks in plants
- Comparative genomics of yield related traits in rice
- Cereal grain quality analysis
- Proteome analysis
- Development and validation of molecular markers
- Marker assisted selection in rice

*No requirement of prerequisite for Masters Course work only students.*

*Statistics is required if the basic degree does not include a statistics course or if the grade obtained is below B grade for Research degrees only(M.Sc- CW & R , M.Phil. or Ph.D)*

# Master of Plant Biology Conservation and Breeding

No. of Credits: 30

Minimum Programme Duration: 3 semesters

Entry Requirements: All applicants must possess a Bachelors Degree in Agriculture, Bioscience, Plant Science, Food science or any equivalent qualification from a recognized Institute of Higher Education acceptable to the Senate of the University of Peradeniya.

## Overview

This program is designed to provide a broad base in principles and applications in major disciplines of plant physiology, genetics plant breeding, plant systematics, plant genetic resource conservation/ utilization and plant biotechnology to develop human resources required for the development of agriculture and other sectors of the country .

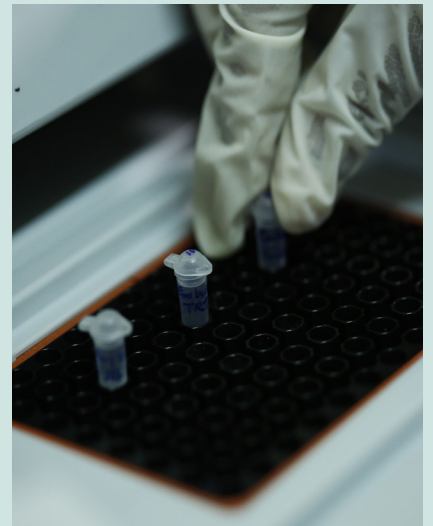
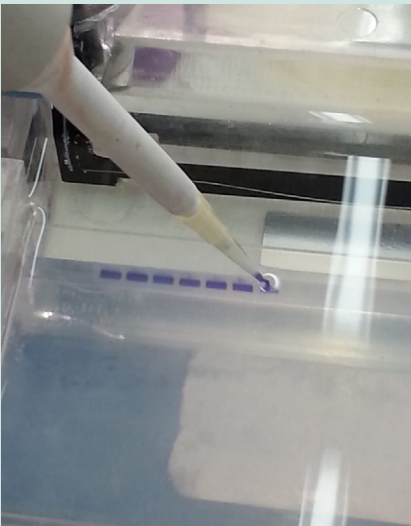
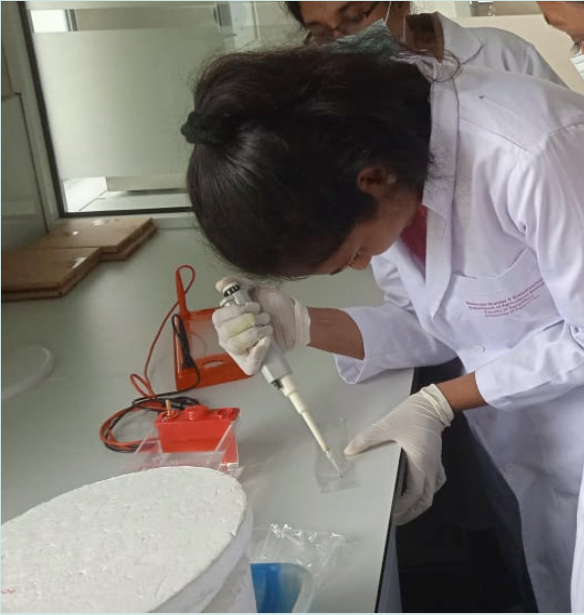
## Key features

This Master programme provides an opportunity for each student to acquire the necessary knowledge and skills including hands on experience in techniques related to the above disciplines. This will enable the students to acquire a sound knowledge to develop their career paths and be employable in Sri Lanka and abroad. Furthermore, students who successfully complete this programme would use this Master to gain successful placement in foreign universities for their doctoral degrees.

Code	Title	Credits	Option
First Semester			
AB 5108	Principles of Plant Breeding	2	Compulsory
AB 5110	Crop Genetic Resources	1	Compulsory
AB 5111	Exploration and Characterization of PGR	2	Compulsory
AB 5113	Photosynthesis and Plant Productivity	2	Compulsory
AB 5120	Theory and Techniques of Plant Gene Manipulation	2	Compulsory
AB 5195 *	Practicum 1 - Biology	1	Compulsory
AB 5102	Water Relational and Nutrition	2	Elective
AB 5103	Plant Systematics	2	Elective
AB 5105	Cellular Genetics	2	Elective
AB 5109	Plant Reproductive Biology	1	Elective
AB 5115	Assessment of Genetic Diversity	1	Elective
AB 5116	Plant Biochemistry	2	Elective
AB 5154	Valuing Plant Genetic Resources	1	Elective
AB 5196**	Practicum in Biotechnology I	1	Elective
PP 5151	Plant Molecular Biology	2	Elective
CS 5114	Biodiversity	2	Elective
ST 5154	Statistical Genetics	2	Elective
Second Semester			
AB 5205	Stress Physiology	2	Compulsory
AB 5211	Methods in Plant Genetic Resources Conservation	2	Compulsory
AB 5213	Plant Growth and Development	1	Compulsory
AB 5214	Biotechnology in Plant Improvement	1	Compulsory
AB 5235	Scientific Communication in Biology	1	Compulsory
AB 5295*	Practicum 2 - Crop Improvement	1	Compulsory
AB 5298	Directed Study	5	Compulsory
AB 5209	Nutritional Quality Improvement of Food Crops	1	Elective
AB 5210	Statistical genomics in biotechnology	2	Elective
AB 5215	Population Genetics	2	Elective
AB 5217	Breeding Strategies of Economic Crops	2	Elective
AB 5218	Character Inheritance Mechanisms	1	Elective
AB 5230	Plant Variety Protection, Intellectual Property Rights & Policy Issues	1	Elective
AB 5232	Variety Testing for Adaptability	1	Elective
AB 5296**	Practicum in Blotechnology II	1	Elective
AB 5299	Seminar	1	Elective
CS 5225	Advanced Plant Tissue Culture	2	Elective
ST 5155	Design and Analysis of Experiments	2	Elective

\* Each student must take at least One practicum (AB 5195 or AB 5295) to complete the degree or allow to take Both for crediting.

\*\* Students who wish to follow practicum 1 and II of Biotechnology Programme can follow those for crediting by making the relevant payments





# Master of Biotechnology

No. of Credits: 30

Minimum Programme Duration: 2 semesters

Entry Requirements: Applicants must possess a Bachelors Degree in Agriculture, Life Sciences (eg. Bioscience, Plant Sciences, Medicine, Animal & Veterinary Sciences, Microbiology, Biotechnology, Food Science) or any equivalent qualification from a recognized Institute of higher education acceptable to the Senate of the University of Peradeniya.

## Overview

Biotechnology is the most demanding and challenging discipline in the biological sciences. With the advent of recombinant DNA technology and its rapid advances, many novel research and employment avenues have opened up in diagnostics and pharmaceutical industries in addition to conventional fields.

## Key features

This programme offers a wide range of courses covering the fundamentals in molecular biology to advanced applications in plant, animal, human and industrial biotechnology. The practical exposure provided in the laboratories at the Department of Agricultural Biology equip students with essential-hands-on- skills in molecular biology and biotechnology.

The majority of the students who followed this programme continue their studies in reputed foreign universities and obtain carrier opportunities both national and international institutions.

Code	Title	Credits	Option
<b>First Semester</b>			
AB 5107	Microbial Genetics	2	Compulsory
AB 5116	Plant Biochemistry	2	Compulsory
AB 5119	Molecular Biology	1	Compulsory
AB 5122	Gene Manipulation	2	Compulsory
AB 5196	Practicum in Biotechnology I	1	Compulsory
AB 5101	Cell Biology	2	Elective
AB 5105	Cellular Genetics	2	Elective
AB 5106	Exploring the Genomes: Principles & Techniques	2	Elective
AB 5114	Biosensing	2	Elective
AB 5118	Polygenic Inheritance	2	Elective
AB 5125	Protein Engineering	1	Elective
AB 5126	Enzyme Production Technology	2	Elective
AB 5155	Molecular & Functional Glycobiology	2	Elective
CS 5123	Plant Tissue Culture - Micropropagation	2	Elective
<b>Second Semester</b>			
AB 5222	Gene Expression & Developmental Genetics	2	Compulsory
AB 5228	Molecular Breeding & DNA Fingerprinting	2	Compulsory
AB 5229	Genetically Modified Organisms, Food, Feed and Processed Products and Biosafety	1	Compulsory
AB 5236	Production of Transgenics	1	Compulsory
AB 5252	Bioinformatics	2	Compulsory
AB 5296	Practicum in Biotechnology II	1	Compulsory
AB 5298*	Directed Study	5	Compulsory
AB 5299	Seminar	1	Compulsory
AB 5202	Advanced Genetic Analysis: Genes, Genomes and Networks	2	Elective
AB 5204	In vitro Techniques for Biotechnology	2	Elective
AB 5220	Marine Biotechnology	1	Elective
AB 5223	Cereal Biotechnology	1	Elective
AB 5224	Secondary Metabolite Production	1	Elective
AB 5227	Cellular Immunology	1	Elective
AB 5230	Plant Variety Protection, Intellectual Property Rights & Policy Issues	1	Elective
AB 5233	Nanotechnology in Agriculture	1	Elective
AB 5235	Scientific Communication in Biology	1	Elective
CS 5225	Advanced Plant Tissue Culture	2	Elective