

Course Detail
Master of Science Program in Biology

Course Title: Master of Science Program in Biology (International Program)

Master Degree: Master of Science (Biology), M.Sc. (Biology)

Academic Institution: Division of Biological Science, Faculty of Science, Prince of Songkla University

Duration: 2 years (June 2022 - May 2024)

Background and Rational:

Master of Science Program in Biology aims to produce graduate students with profound knowledge in biology including genetics and cell biology, botany, zoology and ecology, as well as 21st century skills which consists of critical thinking and the ability to build knowledge in biology. This will lead to the effective capability to transfer knowledge to general public through publications and media. Graduates are able to understand the scientific problem and turn it into research questions which will greatly improve our understanding of biological resources and ecosystems, particularly in Thai-Malay peninsula and Southeast Asia.

Objectives:

1. Can apply knowledge in biology to solve biological issues of plants or animals in the Malay Peninsula, especially in taxonomy and ecology
2. Can select appropriate tools and methods to test hypotheses in research
3. Can use information technology (IT) to search for information and proceed academically correct in the field of interest related to biology
4. Can communicate and present academic information precisely and directly
5. Have academic ethics and have a public responsibility
6. Can carry out duties while working with others

Course Synopsis and Methodology:

Study plan

Course Structure	A Number of Credits	
	Plan A1	Plan A2
Required subject	-	5
Elective subject (no more than.....)	-	11
Thesis	36	20
Total	36	36

Course content

Plan A1

Thesis

331-591 Thesis 36(0-108-0)

Individual research in biological problems under supervision of the advisory committee

Plan A2

Required subject

- 330-500 Research Techniques in Biology 3((2)-3-4)
Development of concepts and theories in biology; biological questions; literature review; techniques in biological research; research ethics; research planning; data analysis using computer; application of statistical methodology to design experiments and field surveys; research presentation and publication; practice
- 331-571 Seminar in Biology I 1(0-2-1)
A literature review, presentation, and discussion of the interesting and recent scientific topics in biology
- 330-572 Seminar in Biology II 1(0-2-1)
Presentation and discussion related to thesis

Elective subject

- 330-501 Biogeography 2((2)-0-4)
Distribution of living organisms in a spatial and temporal contexts; focusing on pattern of distribution analysis and interpretation; causes of different patterns of distributions in both plants and animals; phylogeography as well as the relationships between physical changes and organism evolutionary dynamics; impacts of human activities on ecology and distribution of organisms
- 330-502 Philosophy of Science 2((2)-0-4)
Development of scientific thinking through the development of human society to the present time; scientific inquiry as well as scientific process; case study
- 330-512 Aquatic Insects 3((2)-3-4)
Morphology, classification and identification, physiology, behavior and ecology of aquatic insects; collecting and preserving aquatic insects; laboratory study and field trip
- 330-513 Palynology 3((2)-3-4)
Spore and pollen morphology; evolutionary and morphological trends of spore and angiosperm pollen; studies of pollen and spore morphology in some selected families; applied to pollination ecology and biology, plant geography, geology, archeology, paleontology, forensic science and medical science, preparation method through permanent slide for studying with light and scanning microscopes; laboratory study
- 330-520 Photosynthesis 3((2)-3-4)
Processes and mechanisms of photosynthesis; ecophysiological aspects of photosynthesis; acclimation to different environments and climate change; photosynthesis measurement techniques; laboratory study
- 330-521 Plant Ecophysiology 2((2)-0-4)
Interaction between environment, both physical and biological, with plant physiology; plant stress physiology; acclimation and plasticity of plant physiological

- 330-533 Module: Techniques in Plant Taxonomic Revision 5((4)-3-8)
Theories and concepts in plant taxonomy; international code of nomenclature; plant taxonomic problems; information for identification and taxonomic revision; current knowledge and methodology in plant taxonomy; plant collecting and herbarium management, photographic and illustration technique, molecular technique and data analysis; case study; individual study of interesting plant taxonomic problem; field trip
- 330-534 Ichthyology 3((2)-3-4)
Biology of fishes; diversity, evolution, morphology, physiology, ecology, behavior, biogeography and applied ecology in the sense of fisherie management and aquaculture; laboratory and fieldwork activities focusing on the ecology and behavior of important local fish species
- 330-535 Mammalogy 3((2)-3-4)
Origin and evolution of mammals; diversity; classification; morphology; physiology; behavior; ecology; zoogeographical distribution; importance and conservation of mammals; laboratory on mammal classification and field trip
- 330-536 Biology of Crustaceans 3((2)-3-4)
Morphology, anatomy, physiology, embryology, ecology and taxonomy of crustaceans with emphasis on the economic importance; field trip
- 330-537 Techniques in Plankton Identification 3((1)-6-2)
Basic knowledge on morphology of plankton, techniques in plankton identification, preparation of permanent slide for reference collection, preparation and identification of plankton with light and electron microscope; laboratory study
- 330-540 Plant Growth and Development 3((2)-3-4)
Plant growth regulator and applications, factors controlling plant growth and development, stress physiology
- 330-550 Coral Reef Ecology 3((2)-3-4)
Biology of Cnidaria, taxonomy of corals, reproduction, growth, nutrition, energy allocation, competition, reef forming system; their distribution, relationships between coral reef organisms; nutrient cycling in reef as well as reef conservation; laboratory study and field trip
- 330-551 Module: Advanced Marine Ecology 5((4)-3-8)
Theories and concepts in marine ecology; physical and biological oceanography; marine biodiversity and ecosystems; Methods for assessment of population size and dynamics, biodiversity, productivity, species interactions and energy flow; application of theory to experimental and field survey practices
- 330-552 Mangrove Ecology 3((3)-0-6)
Environmental condition of mangrove forests; structure, species composition, distribution of mangrove flora and fauna; interrelationships among organisms and environment; energy flow, nutrient cycling with emphasis on detrital food chains; utilization and conservation of mangrove forests; field trips and special projects

330-553 Marine Algal Ecology 3((2)-3-4)
Ecology of marine algae with emphasis on distribution, abundance, and dynamics of marine algal population and community; the ecological roles of marine algae; methods in marine algal ecology; anthropogenic and climate change impacts on marine algae; the potential use of marine algae; laboratory study and field trip

330-554 Insect Population Ecology 3((2)-3-4)
Interactions within insect populations; insect ecosystem; impacts of environments on insect life cycle; life table; analysis of survival and mortality rate affecting insect population density and distribution; analysis of population dynamic; applications to pest control; study of insect molecular genetic; laboratory study

330-556 Plankton Ecology 3((2)-3-4)
Importance of plankton in aquatic ecosystem; ecology of plankton community and limiting factors; research techniques; ecological index and application; impacts of plankton production on aquatic animals and fisheries; plankton culture; laboratory study and field trip

330-561 Plant Molecular Genetics 3((2)-3-4)
Gene regulation; genetic engineering; DNA mutation; changes in structure and number of chromosomes; factor and mechanism involving in mutation; roles of mutation in plant evolution and breeding; case study

330-571 Histochemistry 3((1)-6-2)
Methodology for analysis of the chemical components and enzyme activities of cells and tissues under the microscopy

330-580 Insect Biotechnology 3((2)-3-4)
Identification of beneficial proteins from insects; expression of insect proteins; insect genome sequencing; insect transcriptome; insect genetic engineering; laboratory study

330-581 Plankton Biotechnology 3((2)-3-4)
Physiology and biochemistry of plankton, expression of plankton gene; plankton genome sequencing; laboratory study

330-582 Ecotoxicology 3((3)-0-6)
Major classes of contaminants; uptake, biotransformation, detoxification, elimination and accumulation of contaminants in organisms; effects of contaminants on molecular level, DNA, chromosomes, cells, tissues, and organs; impacts of the environmental contaminants to the physiology of organisms; application of biomarkers and phytoremediation

Thesis

331-592 Thesis 20(0-60-0)
Individual research in biological problems under supervision of the advisory committee

Graduation Conditions:

1. Proof of English proficiency as required by the Graduate School
2. All required courses have been completed with an overall GPA ≥ 3.00 except Plan A1
3. The proposal/thesis/minor thesis exam result is 'S' = satisfactory together with the completed thesis submission.
4. The research has been published according to the requirements of the regulations/ program/ scholarship/other as applicable.
5. Other conditions as required by regulation, criteria and guidelines.

Applicant Qualifications:**Plan A1**

1. Applicants must hold a bachelor's degree in biology or relevant field with GPAs no less than 3.5 as well as experiences in research related to biology.
2. Applicants must have passed English proficiency test accredited by Graduate School no longer than 2 years ago such as TOEFL (Paper Based) at least 450 points, TOEFL (Computer Based) at least 133 points, TOEFL (Internet Based, iBT) at least 45 points, IELTS at least 4.0, CU-TEP at least 45 points or PSU-TEP at least 45%. Each case is subjected to the decision of the curriculum committee.

Plan A2

1. Applicants must hold a bachelor's degree in biology or relevant field with GPAs no less than 2.5 as well as experiences in research related to biology for at least 2 years. Each case is subjected to the decision of the curriculum committee.
2. Applicants must have passed English proficiency test accredited by Graduate School no longer than 2 years ago such as TOEFL (Paper Based) at least 450 points, TOEFL (Computer Based) at least 133 points, TOEFL (Internet Based, iBT) at least 45 points, IELTS at least 4.0, CU-TEP at least 45 points or PSU-TEP at least 45%. Each case is subjected to the decision of the curriculum committee.

Document required:

1. A recommendation letter
2. A transcript
3. A brief research proposal
4. Results of English proficiency test

Contact:

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***The application procedure will complete when TICA has received the hard copy of the application form and other related documents through the Royal Thai Embassy/Permanent Mission of Thailand to the United Nations/Royal Thai Consulate – General accredited to eligible countries/territories.