



BIOLOGY DEPARTMENT
COLLEGE OF ARTS & SCIENCES
SILLIMAN UNIVERSITY
Building Competence, Character & Faith

MASTER OF SCIENCE IN BIOLOGY
(Revised SY 2011-2012)

PHILOSOPHY AND OBJECTIVES

The new graduate program in Biology is designed to:

1. Provide exceptionally qualified students with research orientation within the general field of Biology
2. Prepare these students for careers as teachers and scientists, culminating in research activity suitable for a publishable thesis.
3. Enlarge, through research, the body of knowledge on Philippine Biology and disseminate this knowledge through publications and improved teaching, imbued with the values of Christian living, honesty and integrity in quest for truth.

ADMISSION TO GRADUATE STATUS

Applicants to the M. S. Biology program must meet the general requirements for admission to the Graduate School of the University, as set forth in the General Catalogue. A student seeking admission to the M. S. program should hold a bachelor's degree from an institution of recognized standing. Applicants who are non-biology majors, e.g. pre-meds, medical technologists, etc. will be required to enroll in certain undergraduate upper division biology courses until they complete a total of at least 36 units of undergraduate major courses. Their academic work should be substantially equivalent, in distribution of content and in scholastic achievement, to the requirements for a comparable degree at Silliman University.

In accordance with the research-oriented objectives of the M. S. program, the Biology Department shall admit the student to graduate status on the basis of promise of success in the study program and general topic of research, as judged primarily by (1) preliminary interview by a committee of three to be named by the Department Chair and (2) undergraduate academic records. After completion of the academic requirements of thirty units and prior to the thesis work, the student must take and pass the comprehensive written examination.

The examination will cover four recognized fields of biology: general biology (zoology and botany), Anatomy and Physiology, general genetics and embryology, and ecology shall be given a chance to retake the part of the examination they failed. They may not proceed to undertake the work if they fail the second time.

Six (6) graduate units in biology earned from other institutions may be credited towards the M. S. Biology degree at Silliman only if the students had successfully demonstrated competence in the discipline, as revealed by performance on items (1) and/or (2).

REQUIREMENTS FOR THE DEGREE

Only courses in which the students earn grades of 4.0 to 3.0 are counted in satisfaction of the requirements for the M. S. degree and courses for which the student received a grade less than 2.8 must be repeated. The student must maintain a 3.0 average to remain in graduate status.

The M. S. in Biology requires at least two (2) years and must include no less than two semesters in residence.

The program will be planned on an individual basis, according to the student's needs and interest, and will include formal courses a research project leading to a thesis work. The latter shall be of depth and quality to meet the standards of the Department and the Graduate School. Emphasis is placed on findings from original investigation. A student in the M. S. Biology program must complete all requirements within 5 years, for full time students and no more than 6 years for part-time students, enrollment must be continuous. If a student fails to enroll in the succeeding semester, he/she must explain in writing the reason why he/she was unable to enroll and then the chair forms a committee to determine whether the student can still proceed with the program. A student who wishes to stop schooling for whatever reason, must file a leave of absence, signed and approved by the coordinator, the Chair and the Dean of the College of Arts and Sciences. In the event of failure to return after 2 years



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from a leave of absence, the student is required to repeat core subjects and after 5 years of absence, must repeat all core and major subjects. Refusal to repeat will mean the student is automatically dropped from M. S. Biology program.

At present, there is no formal foreign language requirement for the M. S. in Biology degree.

The minimum course requirement for the degree is thirty-six (36) units, distributed as follows: Core courses, 9 units; Major courses, 12; electives, 9; Master's thesis, 6; total - 36 units.

CURRICULUM FOR THE M. S. IN BIOLOGY DEGREE

Core courses:	Biology 101	Elements of Research and Biostatistics	3 units
	Biology 102	Advanced Ecology	3 units
	Biology 103	Principles of Systematics and Evolution	3 units
Major Courses:	Biology 104	Population Biology	3 units
	Biology 106	Tropical Vertebrate Biology	3 units
	Biology 107	Biology of Vascular Plants	3 units
	Biology 108	Marine Biology and Oceanography	3 units
	Biology 109	Freshwater Biology	3 units
Elective Courses	(minimum of 9 units required)		
	Biology 110	Seminar in Conservation Biology and Resource Mgt.	3 units
	Biology 111	Ecology of Parasitism	3 units
	Biology 113	Herpetology	3 units
	Biology 114	Ornithology	3 units
	Biology 115	Mammalogy	3 units
	Biology 116	Biology of Marine Plants	3 units
	Biology 117	Biology of Marine Mammals	3 units
	Biology 118	Microbial Ecology	3 units
	Biology 119	Biochemical Ecology	3 units
	Biology 120	Plant Pathology	3 units
	Biology 121	Seminar in Contemporary Concepts in Ecology	3 units
Master's Thesis:	Biology 250		6 units



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COURSE DESCRIPTION

Biology 101 (Elements of Research and Biostatistics)

3 units

Application of the principles of scientific research to problems. Theoretical and practical introduction to organized investigations, including methods of data gathering, and analysis. Prerequisite: Introduction statistics. Three hours lecture and student presentations. Project/thesis proposal to be presented in a quasi-colloquium.

Biology 102 (Advanced Ecology)

3 units

Examination of interrelationships between organisms and their environment; population and community level interactions; productivity and materials cycling, with application for resource conservation; contemporary methods in ecology. Prerequisite: General Ecology and Introductory Statistics. Two hours lecture and one hour discussion. Original research required.

Biology 103 (Principles of Systematics and Evolution)

3 units

Principles and basis of classification, including phonetics and cladistics; nomenclature. Evidence for and mechanisms of organismic evolution; a discussion on pertinent Christian/non-scientific philosophies on the origin of life will be included. Prerequisite: General Zoology and Botany. Three hours lecture/discussions; museum surveys. Original systematics study of a group of organisms, preferable on Philippine species, required.

Biology 104 (Population Biology)

3 units

Properties of animal and plant aggregations, with emphasis on population and community ecology, population genetics and life histories; evolutionary mechanisms and models of speciation. Prerequisite: Genetics and Elementary Statistics. Three hours lecture/student discussion. Independent research required.

Biology 106 (Tropical Vertebrate Biology)

3 units

Taxonomy, ecology, and biogeography of tropical vertebrates, with special emphasis on Philippine species; aspects of physiology and reproduction; conservation issues will be considered. Prerequisite: General Ecology. Two hours lecture, one hour student-led discussion on current pertinent literature; museum and field surveyed. Independent project required

Biology 107 Biology of Vascular Plants

3 units

A survey of the structure, reproduction, and relationships of the different groups of vascular plants; origin and phytobiogeography; methods in plant studies. Prerequisite: Botany, Plant Taxonomy recommended. Three hours lecture/discussions; botanic field trips. Independent project required.

Biology 108 Marine Biology and Oceanography

3 units

Structure and function of marine ecosystems and life forms with emphasis on system ecology and synecology; principles of physiology and chemical oceanography including analytical techniques for physical-chemical determinations. Prerequisite: Zoology, Botany, General Chemistry, Invertebrate Biology is recommended. Three hours lecture/reports; field trips. Independent project required.

Biology 109 Freshwater Biology

3 units

Structure and function of lake and streams, including origin and formation, biotic composition and organization, and energetics; physico-chemical characteristics and drainage patterns, relevance to watershed management will be discussed. Prerequisite: Zoology, Botany and General Physics. Three hours lecture/discussions; laboratory demonstrations and field trips. Independent project required.

Biology 110 Seminar in Conservation Biology and Resource Management

3 units

Informal discussions and student seminar reports on subjects of current interest based on an intensive study of its literature. Specific topics will vary (to be defined by professor prior to registration) but will focus on recent and relevant advances in the fields of conservation ecology, including conservation of genes, and resource use and management. Prerequisite: General Ecology. Three hours discussions/presentations. Independent project required.

Biology 111 Ecology and Parasitism

3 units

An examination of parasitism as an ecological relationship between two species. Origins of parasitism, morphological and physiological adaptations of various parasitic stages to the biology of the host and the external environment will be considered. Prerequisite: General Parasitology or Invertebrate Biology. Three hours lecture/discussion; laboratory demonstrations. Independent project required.



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Biology 113 Herpetology

3 units

Distribution, classification, physiology, ecology and evolution of amphibians and reptiles, with focus on Philippine species, field methods in herpetological collection. Two hours lecture and three hours discussion and lab demonstrations, field trips. Prerequisite: General Zoology. Independent project required.

Biology 114 Ornithology

3 units

Morphology, physiology, distribution, classification and evolution of birds, including flight and migration, reproductive and parental behavior, field methods in bird surveys. Three hours lecture/reports; field trips and or museum surveys. Prerequisite: Zoology. Independent project required.

Biology 115 Mammalogy

3 units

Evolution, distribution, classification, morphology, physiology, behavior, and ecology of mammals, including research methods; classification and biogeography of Philippine mammals. Prerequisite: Zoology. Three hours lecture/discussions, field trips. Independent project required.

Biology 116 Biology of Marine Plants

3 units

Structure, function and relationships of marine plants and algae, with emphasis on reproductive, physiological, and ecological adaptations, and distribution. Prerequisite: Botany. Three hours lecture/discussion; laboratory demonstrations. Independent project required.

Biology 117 Biology of Marine Mammals

3 units

Structure, function and relationship of marine animals, with emphasis of nutrition, respiration, osmoregulation, and excretion, ecological adaptations. Prerequisite: Zoology. Three hours lecture/discussion; laboratory demonstrations. Independent project required.

Biology 118 Microbial Ecology

3 units

Understanding of microbial diversity, adaptations to various environments, role in biogeochemical cycling, interactions between microbes and other organisms; practical applications, including global impact of microbial life. Prerequisite: General Microbiology and Ecology. Three hours lecture/discussion; laboratory demonstrations. Independent project required.

Biology 119 Biochemical Ecology

3 units

Secondary metabolism, evolution and ecological significance of secondary compounds, biochemical interactions between organisms. Practical applications and methods of analysis. Three hours lecture/discussion; laboratory demonstrations. Review paper required.

Biology 120 Biochemical Ecology

3 units

Introduction to the study of plant diseases, including diseases of natural and cultivated plant systems; principles of disease control with emphasis on biological agents. Prerequisite: Botany and Microbiology. Three hours lecture/discussion; laboratory demonstrations. Independent project required.

Biology 121 Seminar in Contemporary Concepts in Ecology

3 units

Informal discussions and student seminar presentations on biological concepts and scientific philosophy, including associated advances to biological research methods and investigations based on a critical review of contemporary literature. Prerequisite: Concept of Instructor. Three hours report and discussions. Written seminar report required.