Mission Statement
We are a Catholic institution of learning dedicated to advancing thefrontiers of knowledge in the theoretical and applied fields through quality
graduate education that is comprehensive and responsive to the needs of
society. We are committed to the formation of scholars and high-quality
professionals who are ethical, competent, compassionate, and committed
to the service of their respective professions, the church, the nation, and
the global community.

Vision Statement
We envision a Graduate School that stands for excellence and innovation
and that is globally recognized for its distinct degree programs and quality
research outputs.

Goals and Objectives
The Graduate School commits itself to develop:
1. competent professionals who, inspired by the ideals of St. Antoninus
   of Florence, promote excellence in the production, advancement,
   and transmission of specialized knowledge and skills in the sciences,
   the arts, and community service;
2. scholarly researchers and creative thinkers who, kindled by St.
   Thomas’ ardent for truth, aspire to become fonts of intellectual creativity
   and, in their quest for quality research, are proficient and critical in assessing
   and communicating information in various fields that impact the professions,
   the church, the nation, and the global community;
3. professional Christian leaders who, touched by St. Dominic de
   Guzman’s apostolic fire and warmed by Mary’s motherly care,
   articulate ethics and truth, high level of moral maturity in resolving
   issues and promoting social justice and compassion for the poor,
   and care for the environment;
4. globally engaged citizens who, with ardent advocacy for life,
   promote a deeper understanding of tolerance and justice as well as
   linguistic, religious, and cultural diversities as a result of precise
   evaluation of modern problems and inquiries;
5. committed scholars who, nurtured by the dogmas of Christian faith
   and values, are dedicated to the pursuit of truth through the
   promotion of an intellectual culture that value academic rigor and
   freedom of scientific investigations; and
6. lifelong learners who, empowered by St. Antoninus of Florence’s
   zeal for learning, are committed to the advancement of a higher
   culture through a continuous search for intellectual inquiries and new
   knowledge as well as faithfulness to Catholic intellectual traditions.

Program Intended Learning Outcomes (PILO)
Upon successful completion of the M6 major in Biology Program, the graduate will be able to:
1. Solve critically and creatively problems set in biology, and apply
   biological techniques in research and the academe.
2. Analyze and generate new ideas in biology through research
   and analysis of given data/information.

3. Work efficiently and effectively in individual- and group-
   oriented activities in the field, classroom or laboratory setting.
4. Convey biological concepts in a clear and concise manner before
   a broad range of audience in both written and oral form.
5. Apply biological concepts to address issues in environmental
   protection, conservation, utilization of natural resources for
   sustainable and ethical use.
6. Foster the use of knowledge and research to an inquiry-based
   practice in the field of biology.

MASTER OF SCIENCE IN BIOLOGY
DOCTOR OF PHILOSOPHY MAJOR IN BIOLOGY

PREREQUISITE COURSES (M.Sc.: 3 UNITS; Ph.D.: 6 UNITS)
GS 500 – St. Thomas and Critical Thinking

As the philosophical foundation of Research Methodology, it is a study of
the principles of and skills in critical thinking according to St.
Thomas Aquinas in the three areas of mental cognition: simple
apprehension, judgment and reasoning; and of common fallacies
concerning the art of argumentation.

PHL 821 – Philosophy of St. Thomas Aquinas
An exposition of the essential philosophical teachings of the Angelic
Doctor organized around the 24 fundamental theses of Thomism
against the backdrop of St. Thomas Aquinas’ successful synthesis of
Scholastic Philosophy, Biblical and Catholic Tradition and Aristotelian
Method.

PHL 603 – Philosophy of Nature
A background study on the logical structure of hylemorphism and
other comparative theories, introduction to the function and meaning
of philosophy of science, and of treaties on the philosophy of life,
the role of models and paradigms in scientific revolution, processes
and interdependence.Practicum in definitional analysis, philosophical
reflection on various life and exact scientific specializations.

PHL 823 – Philosophy of Values
A survey exposition of the moral philosophies dating back from
Socrates Buddha and Confucius to contemporary moral philosophies
around a reflective critique of these in the light of contemporary
Catholic moral thought.

*M.B. students who are not graduates of UST for their M.Sc. must take GS 500

Mandatory Courses (M.Sc.: 15 UNITS)
BIO 600 – Advanced Systematics
A practical knowledge of revisionary taxonomy and the phylogenetic
principles. It explores the principles and methods of zoological and
botanical/fungal nomenclature, biotic inventory, and description of
new taxa, phylogenetic analysis, and classification. Special exercises
will delve into protocols for basic taxonomic studies (including species
description), and methods of phylogenetic analysis with a particular
emphasis on morpho-anatomical characters.

BIO 601 – Advanced Cell & Molecular Biology
Advanced Cell and Molecular Biology focuses on the advanced concepts
and applications of cytology and molecular biology. The course tackles
the relationship between the cell’s molecular structures and functions,
the dynamic character of cellular organelles; the use of chemical
energy in cellular activities, the unity and diversity at the
macromolecular and cellular levels, and the mechanisms that regulate
cellular activities.

BIO 602 – Advanced Ecology
This course facilitates the recognition of the foundations and basic
concepts of ecology and the application of these to current topics on
ecology such as landscape ecology and ecosystem management. The
basic and advanced concepts of the ecological principles which govern
the interactions between plants and animals will be presented.

BIO 603 – Advanced Developmental Biology
The study of the structural and physiological changes occurring in a
developing vertebrate organism from fertilization, embryogenesis,
agonogenesis, metamorphosis, development and growth. Molecular
processes involved in differentiation, determination and specialization
of embryonic cells are also discussed.

BIO 604 – Advanced Genetics
Study of the principles of the molecular and physical bases of biological
diversity; the mechanism resulting from these diversities and the
principle that govern their heredity from one generation to another.

Mandatory Courses (M.Sc.: 15 UNITS; Ph.D.: 15 UNITS)

Molecular Sciences Track

BIO 700 – Advanced Virology
A course on modern medical virology, with an emphasis on structure,
molecular biology, viral replication, mutations, evolution of viruses,
host cell interactions and pathogenesis, as well as diagnosis, control
and prevention of infection.

BIO 701 – Advanced Immunology
The study of the immune system and the immunological principles at
the cellular level from the perspective of cell and developmental
biology, and at the molecular level with emphasis on the molecular
structure of antigen-antibody interactions and gene regulations
in view of understanding the medically significant disorders of the
immune system.

BIO 702 – Current Techniques in Molecular Biosciences w/ Lab
Principles and applications of different molecular techniques to better
understand the Molecular Sciences.

BIO 703 – Advanced Biochemistry
Advanced topics in biomolecular interactions with emphasis on
experimental approaches and problem solving.

BIO 704 – Molecular Phylogenetics w/ Lab
Principles of phylogenetic techniques, terminologies and analysis using
molecular data.

BIO 705 – Bioinformatics
This course is designed to introduce bioinformatics concepts, principles,
and techniques within the framework of basic shell scripting and web-
based databases/tools.

BIO 800 – Aquatic Biotechnology
Study of and application of biotechnology for the direct and indirect
use of aquatic organisms or parts or products of living aquatic
organisms in their natural or modified forms.

PLANT BIOLOGY TRACK

BIO 706 – Plant Morphology & Anatomy w/ Lab
Comparison of plant form and functions.

BIO 707 – Field Botany w/ Lab
Survey and collection of botanical specimens and analysis of their
ecological distribution.

BIO 708 – Bryology w/ Lab
Introduction to the systematic and evolution of bryophytes (mosses,
hornworts and liverworts).

BIO 709 – Physiology w/ Lab
Introduction to the systematic, identification, morphology and
ecology of micro and macro algae from marine and freshwater
environments.

BIO 710 – Ethnobotany
The interaction of people and plants with a broad survey of the
diversity of plants described both scientifically and culturally.

BIO 711 – Periodyology w/ Lab
Introduction to the systematic and evolution of ferns and fern allies.

BIO 712 – Economic Botany
Studies plants that are significant and important to both the ecosystem
and the national economy. Traditionally useful plants found growing
within an area occupied by a particular community whose culture have
some bearing on useful plants are included.

BIO 704 – Molecular Phylogenetics w/ Lab

BIO 705 – Bioinformatics

BIO 801 – Plant Physiology with Lab
Examine plant physiology and relates this to growth and development.

BIO 802 – Phylogeny of Land Plants
A broad, evolutionary overview of plant diversity (club mosses and
ferns to conifers and flowering plants) based on the currently
accepted classification of the APG (Angiosperm Phylogeny Group).
### BIO 803 - Descriptive Language of Taxonomy
A practical method of recording taxonomic descriptions for computer processing and generating natural language descriptions, interactive and illustrated identification, and information retrieval.

### BIO 804 - Plant Pathology
The scientific study of plant diseases caused by pathogens and environmental conditions.

### Environmental Biology Track

#### BIO 713 - Aquatic Biology
The ecology of freshwater and marine environments.

#### BIO 714 - Field Zoology w/ Lab
The principles and practice of proper sampling, processing and analysis of zoological specimens based on actual field and laboratory exercises.

#### BIO 707 - Field Botany w/ Lab

#### BIO 715 - Terrestrial Biology
The ecology of terrestrial environments.

### BIO 716 - Environmental Microbiology
This studies the microbial communities and their processes and interactions in the natural environment. It focuses on microbial communities and diversity in aquatic and terrestrial ecosystems and their different metabolic processes in response to biotic and abiotic factors.

### BIO 805 - Population Genetics
The branch of evolutionary biology concerned with the genetic structure of populations and how it changes through time.

### BIO 806 - Biogeography
The study of plant and animal distribution in space and time.

### BIO 807 - Biodiversity & Conservation Biology
The principles and practice of biodiversity and conservation with emphasis on the Philippine setting.

### BIO 808 - Ecotoxicology
Broad overview of different aspects of ecotoxicology, including environmental chemistry, toxicology, ecology and risk assessment related topics.

### BIO 809 - Biostatistics for Biodiversity and Ecology
Introduction to the use of statistical tools and software for interpreting data with emphasis on their application to biodiversity and ecological research.

### Animal Biology Track

#### BIO 717 - Invertebrate Systematics and Evolution
The evolution and systematics of invertebrate animals starting with a review of basic rules in zoological taxonomy and systematics, natural history collections as well as trace the origins and development of different invertebrate phyla.

#### BIO 718 - Vertebrate Systematics and Evolution

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### Terminal Requirements (M.Sc. - 9 Units)
- Written Comprehensive Examinations (WCE)
- TW I - 3 units (Thesis Proposal)
- TW II - 3 units (Research Colloquium)
- TW III - 3 units (Thesis Defense)

### Terminal Requirements (Ph.D. - 15 Units)
- Written Comprehensive Examinations (WCE)
- Graduate Seminar - 4 units (1 unit for every term for 4 terms)
- DW I - 6 units (Dissertation Proposal)
- DW II - 3 units (Colloquium and Publication)
- DW III - 3 units (Dissertation Defense)

Total = 36 units – M.Sc. 37 units – Ph.D.