

## GRADUATE SCHOOL MISSION STATEMENT

We are a Catholic institution dedicated to advancing the frontiers 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 level professionals who are ethical, competent, compassionate and committed to the service of the Church, the Nation and the Global Community.

## GRADUATE SCHOOL VISION STATEMENT

We envision a Graduate School that stands for excellence and innovation and that will be globally identified for the distinction of its programs and quality of its research.

## GRADUATE SCHOOL GOALS

To realize this mission-vision, the Graduate School commits itself within the next five (5) years:

- To develop the intellect and creativity through excellence in instruction, research, and extension work.
- To form scholars and high level professionals in the arts and humanities, the natural and allied health sciences, the social and management sciences who are ethical and who demonstrate competencies functional in both the local and global workplace.
- To hone the professional and social skills, and critical capabilities of students enabling them to become responsible leaders in their careers and community.

- To provide students opportunities to serve the larger community through extension work and community service.
- To produce quality research in the various fields of knowledge that is internationally recognized.
- To recruit Faculty who are acknowledged experts in the field and to complement the teaching staff by inviting international scholars in the various disciplines.
- To build partnerships and linkages between the Graduate School and academic institutions, industry and government entities at the local and international level.
- To enhance the image and visibility of the Graduate School and its work in both the local and global community.

## APPLICATION PROCEDURES

- A. Application for admission to the UST Graduate School is until October 15 for October enrollees, April 5 for Summer enrollees and May 25 for June enrollees.
- B. Application forms for Admission are available at the UST Graduate School, UST Admissions Office & at the UST Graduate School Web Site – <http://www.ust.edu.ph>

## REQUIREMENTS:

Certified true copy of Transcript of Records, one (1) colored passport size, recent photo (if any) document(s) attesting to passing a Bar/Board Exam, or being a scholar of any agency.

Two (2) Referral Forms: One(1) for the current (immediate) superior (or Dean, in the case of a school); and the other, for the professor in one specialization (major) subject.

## For Foreigners:

**All of the above and;**

TOEFL English Proficiency and Student Visa Requirements.

## ADMISSION REQUIREMENTS

1. Bachelor's Degree in Microbiology or related courses with a general average of at least 2.0/85% or B.
2. Complete accomplished application and referral forms.

## PHILOSOPHY & OBJECTIVES

The graduate program in the Sciences are designed to nurture graduates committed to the advancement of scientific knowledge and research.

Consistent with this philosophy, the Master of Science programs aim to

- a. hone the critical capabilities of students for scientific inquiry by producing quality research that is globally recognized,
- b. contribute to the development of high level Science and Technology manpower in the country.

## CURRICULUM

### **MASTER OF SCIENCE MAJOR IN MICROBIOLOGY**

#### PRE-REQUISITE SUBJECTS: 6 UNITS

#### **MIC 500 - Biostatistics**

A competency-oriented course which emphasizes both the theoretical and the practical aspects of biostatistics. This course presents fundamental concepts in descriptive biostatistics, exploratory data analysis, and statistical inference, focusing on probability and analysis of one, two, three or more samples. Topics include discrete and continuous probability models; expectation and variance; central limit theorem; inference, including hypothesis testing and confidence for means, proportions, and counts; maximum likelihood estimation; sample size determinations; elementary non-parametric and parametric methods; graphical displays; and data transformations.

#### **MIC 501 - Research Methodology**

The Course introduces the student to research concepts relevant to the Natural Sciences. Discussions center on the nature and process of scientific inquiry; the ethical and social responsibilities of the research scientist; and the skills required to do meaningful research in the Natural Sciences. The course also guides the student in the preparation of a scientific review paper or a research project.

#### CORE SUBJECTS: 12 UNITS

#### **MIC 601 - Advanced Microbiology**

This lecture and laboratory course presents advanced studies of microorganisms and their role and applications in the environment, in the human society and in our body. It will discuss different groups of microbial life particularly bacteria, their structural and metabolic diversity, their growth and control, and their genetics and evolution. Particular interests will be given to recent techniques employed, both conventional and molecular, in microbiology as well as recent developments in this field of study, more specifically on systematics and evolution, physiology, and ecology.

#### **MIC 602 - Analytical Microbiology**

The course will deal on the efficacy and safety of consumer preparations and the role of microorganisms: bacteria and fungi in contamination, and quality and safety reduction of these products. Likewise, it will introduce methods to determine preservative efficacy, and of detection, identification, and quantification of contaminating microorganisms. By the end of the semester, students are provided with knowledge, understanding, and skills related to microbiological analytical systems for cosmetics, pharmaceutical preparations and other consumer products.

#### **MIC 603 - Microbial Diversity, Systematics & Evaluation**

#### **MIC 604 - Microbial Genetics**

This lecture and laboratory course presents advanced studies of the principles of heredity in microbial systems, particularly bacteria, and its application in other fields of microbiology and molecular biology. It will discuss bacterial genetic

elements, flow of genetic information, DNA mutations and repair, and other mechanisms of genetic exchanges. It also presents the current techniques employed in the study of microbial genetics, genomics and evolution.

**MAJOR SUBJECTS : 12 UNITS**

**MIC 701 - Virology \***

Basic and Applied Virology and current advances with emphasis on human viruses that are causes of leading viral infections and diseases in the Philippines, epidemiology, immunity, prevention and control .

**MIC 702 - Mycology**

Survey of the major fungal groups with emphasis on the taxonomy, life histories, developmental morphology, physiology and genetics; economic importance and relationship with other organisms.

**MIC 705 - Immunology \***

Structural, cellular and genetic basis of immune response; basic methods of immunology and immunochemistry.

**MIC 706 - Microbial Physiology \***

A comparative approach to the study of the morphology and function in the different groups of microorganisms.

**MIC 707 - Microbial Ecology**

Study of the interaction of microorganisms among themselves and with the various factors in the environment.

**MIC 709 - Microbial Biotechnology**

This lecture and laboratory course presents advances studies of microorganisms and their application in biotechnology. It will discuss different groups of microbial life, their physiological growth and biotechnological by-products as well as various factors affecting their growth and production. Particular interests will be given to antibiotic-producing actinomycetes, enzyme-producing fungi and ethanol-producing yeasts as well as fungi involved in bioremediation.

**MIC 710 - Medical Microbiology**

The biological properties of pathogenic microorganisms; bacteria, rickettsiae, viruses, actinomycetes and fungi, principles of parasitism; ecology of host-microbe interactions.

**MIC 711 - Food and Dairy Microbiology**

Major groups of microorganisms associated with foods, their isolation and characterization; the relationship of microorganisms to food manufacture, preservation and processing and to sanitation.

**MIC 712 - Parasitology \***

A competency-oriented course which emphasizes both the biological and medical aspects of parasites of medical importance.

**MIC 713 - Current Topics in Microbiology\***

**\* No Laboratory**

**COGNATE SUBJECTS: 3 UNITS**

Any related course that has substantial bearing on Thesis.

**OTHER REQUIREMENTS**

Written Comprehensive Examinations (WCE)  
TW I - 3 units (*Thesis Proposal*)  
TW II - 3 units (*Research Colloquium*)  
TW III - 3 units (*Thesis Defense*)

**Total = 42 Units**

**UST GRADUATE SCHOOL ADMINISTRATION OFFICIALS  
AND FACULTY SET-UP**

LILIAN J. SISON, Ph.D.  
**Dean**

JOSÉ ANTONIO E. AUREADA, O.P., S.Th.D.  
**Regent**

MICHAEL ANTHONY C. VASCO, Ph.D.  
**Faculty Secretary**

CARLOS P. GARCIA, Ph.D.  
**Director for Graduate Research**

GRECEBIO JONATHAN ALEJANDRO, Ph.D.  
**Supervising Scientist, Science Laboratories**

ROMUALDO DEL ROSARIO, Ph.D.  
**Supervising Scientist, UST Botanical Garden**

MARIBEL G. NONATO, Ph.D.  
**Consultant for Biology, Chemistry,  
Microbiology & Mathematics**

**PROFESSORIAL STAFF**

JOSÉ ANTONIO E. AUREADA, O.P., S.Th.D.  
VERONICA CHAN, Ph.D.  
GINA DEDELLOS, Ph.D.  
THOMAS EDISON DELA CRUZ, Ph.D.  
IRENEO DOGMA, Ph.D.  
PERCIVAL GARCIA, M.S.  
PETER NG, M.D., Ph.D.  
DELIA ONTENGCO, Ph.D.  
JOHN DONIE RAMOS, Ph.D.

**University of Santo Tomas**

GRADUATE SCHOOL



**GRADUATE PROGRAM**

AY 2006 – AY 2011

**Master of Science  
major in  
MICROBIOLOGY**

España, Manila