

## 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

The Graduate School commits itself to develop:

- 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;
- scholarly researchers and creative thinkers who, kindled by St. Thomas Aquinas' ardour for truth, aspire to become fountains 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;
- 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;
- 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;
- 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 values academic rigor and freedom of scientific investigations; and
- 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.

## APPLICATION PROCEDURES

- A. Application forms for Admission are available at the UST Graduate School, UST Admissions Office & at the UST Graduate School Web Site – <http://graduateschool.ust.edu.ph>

### REQUIREMENTS:

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

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 Chemistry 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 programs 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; and
  - b. contribute to the development of high level Science and Technology manpower in the country.

## CURRICULUM

### **DOCTOR OF PHILOSOPHY MAJOR IN CHEMISTRY**

### PRE-REQUISITE COURSES: 6 UNITS

#### **PHL 821 - Philosophy of St. Thomas Aquinas**

An expository course of the essential philosophical teachings of the Angelic Doctor organized around the 24 fundamental theses of Thomism against the background 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 nature (science), and of treatises 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.

## MAJOR COURSES: 12 UNITS

#### **CHEM 821 - Advanced Organic Spectroscopy**

Advanced techniques in NMR, and MS spectroscopy, and their application to organic compounds.

#### **CHEM 822 - Chemistry of Alkaloids**

Classifications, structure, properties and reactions of the different alkaloids.

#### **CHEM 823 - Stereochemistry**

Principles of organic stereochemistry and application to organic reaction mechanism.

#### **CHEM 824 - Organic Reaction Mechanisms**

Study of biological systems from the view of organic and inorganic chemical theories.

#### **CHEM 825 - Heterocyclic Chemistry**

Synthesis, properties and reactivity of N-, O-, S-containing heterocyclic compounds.

#### **CHEM 831 - Advanced Theoretical Analytical Chemistry**

A computer-based course on the principles, calculations and applications of analytical chemistry, using Excel-based spreadsheets.

#### **CHEM 832 - Bioanalytical Chemistry**

A course covering the application of analytical science to characterization and measurement methods in biochemistry and biology. Includes enzyme methods, immunoassays, DNA assays, biosensors.

#### **CHEM 833 - Surface Analysis & Microscopy**

Principles and methods of surface analysis: X-ray photoelectron spectroscopy, secondary-ion mass spectroscopy, ellipsometry.

#### **CHEM 834 - Chemical Sensors & Biosensors**

A course covering the fundamental principles, designs functions and applications of different types of chemical sensors and biosensors based on optical methods, electrochemical methods, thermal methods, gravimetric methods.

#### **CHEM 835 - Quantum Chemistry**

An introductory graduate level course presenting the mathematical and conceptual formulation of the basic principles of quantum theory and their application to systems of chemical importance, including the electronic structure of atoms and molecules.

#### **CHEM 841 - Chemical Bonding**

Quantum mechanical treatment of atomic structure and molecular structure. Theories of chemical bonding. Molecular geometry.

#### **CHEM 851 - Glycoconjugates**

A course on the study of the carbohydrates covalently linked with other macromolecules such as proteins, peptides, lipids, and other saccharides.

#### **CHEM 852 - Signal Transduction**

A study on the transmission of molecular signals from a cell's exterior to its interior.

#### **CHEM 862 - Chemical Toxicology**

Biochemistry of the mode of action and effects of chemical toxicants on biological systems. Methods of toxicology testing, detection and evaluation of hazards.

## OTHER REQUIREMENTS

Written Comprehensive Exam	
Graduate Seminar	4 units
Dissertation Writing I	6 units
Dissertation Writing II	3 units
Dissertation Writing III	3 units

**Total = 37 Units**

### SUMMARY OF COURSE REQUIREMENTS

Requirements	Ph.D units
Pre-requisites	6
Major Subjects	15
Graduate Seminar	4
Dissertation Writing I	6
Dissertation Writing II	3
Dissertation Writing III	3
<b>TOTAL</b>	<b>37</b>

### SCHOOL CALENDAR

The University of Santo Tomas follows an Academic Year Calendar of two (2) terms and a special term.

Special Term: June- July

For further information, please call,  
Tele-Fax: (632) 740-9732 or  
Tel. No. (632) 786-1611 loc 8247; 731-5396  
Web-<http://graduateschool.ust.edu.ph>  
E-mail: [odgs@mnl.ust.edu.ph](mailto:odgs@mnl.ust.edu.ph)  
or write to:  
The Dean/Faculty Secretary  
UST Graduate School  
España, Manila, Philippines 1008

### UST Graduate School Administration Officials and Faculty Set-up

MARILU R. MADRUNIO, Ph.D.  
*Dean*

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

ALEJANDRO S. BERNARDO, Ph.D.  
*Faculty Secretary*

GRECEBIO JONATHAN D. ALEJANDRO, Dr.rer.nat.  
*Director for Graduate Research*

CHRISTINA A. BINAG, Ph.D.  
*Program Lead*  
Natural Sciences

### PROFESSORIAL STAFF

DHARMATOV RAHULA B. ALBANO, Ph.D.

MA. ALICIA M. AGUINALDO, Ph.D.

JOSE H. BERGANTIN Jr., Ph.D.

CHRISTINA A. BINAG, Ph.D.

BENILDA S. EBARVIA, Ph.D.

CARLOS P. GARCIA, Ph.D.

ALLAN PATRICK G. MACABEO, Ph.D.

MARIBEL G. NONATO, Ph.D.

MA. CRISTINA R. RAMOS, Ph.D.

KAREN S. SANTIAGO, Ph.D.

FORTUNATO B. SEVILLA III, Ph.D.

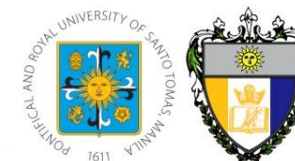
LILIAN J. SISON, Ph.D.

MARIO A. TAN, Ph.D.

BERNARD JOHN V. TONGOL, Ph.D.

OLIVER B. VILLAFLORES, Ph.D.

MAFEL C. YSRAEL, Ph.D.



University of Santo Tomas  
THE CATHOLIC UNIVERSITY OF THE PHILIPPINES  
MANILA, PHILIPPINES  
**The Graduate School**

Doctor of Philosophy major in  
**CHEMISTRY**

AY 2014 - 2017