

## Mission Statement

We are a Catholic institution of learning 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-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 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;
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 values 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 Master of Science in Pharmacy Program, the graduate will be able to:

1. Demonstrate updated and in-depth professional and functioning knowledge of a research program and apply them to topics of your choice in the pharmaceutical fields.
2. Demonstrate skills of critical and creative approaches in the conduct and presentation of documentary requirements of a research.
3. Demonstrate the ability to lead and work independently and collaboratively with others and exercising ethical actions in resolving regulatory and ethical issues.
4. Demonstrate high order level of skills in assessing, analyzing and communicating ideas.
5. Demonstrate global awareness of pharmaceutical trends and practices.
6. Demonstrate initiatives and self-direction to advance one's knowledge and skills in evidence based research using established sources of advance information in the field.

## MASTER OF SCIENCE IN PHARMACY

### PREREQUISITE COURSES: (6 UNITS)

#### GS 500 – St. Thomas and Critical Thinking

It is a course on Aristotelian and Symbolic Logic that focuses on the fundamental laws of thought. It provides guiding principles in order to enhance critical and reflective skills that would facilitate correct and responsible judgment and reasoning. It gives an opportunity to be in control of one's thinking activities.

#### GS 501 – Pharmaceutical Research Methods

Introduces the students to the pharmaceutical elements of research including hands-on working knowledge in computers. It focuses on the form and style of thesis writing using the UST template as well as practical approaches in the preparation of a computerized manuscript.

### CORE COURSES: (9 UNITS)

#### Advanced Pharmacology and Toxicology

The course prepares the graduate students to have a clear understanding and in-depth consideration of the principles, concepts and molecular mechanism to toxicity. The current statutes of toxicologic principles concerned with public health, drugs, food technology, veterinary medicine and agricultures will be examined.

#### Research Ethics

A study of the guidelines needed for responsible conduct of scientific investigation involving pharmaceutical, biological and natural products to ensure high ethical standard of research. Focus is on the ethical principles and the promotion of responsible research concerning human and animal subjects which are based on Nuremberg Code, Helsinki Declaration, Belmont Report and Animal Welfare Act.

### SPECIALIZATION COURSES: (15 UNITS)

Choose five (5) courses only

#### Concepts in Clinical Pharmacy

The course deals with the evolution of Clinical Pharmacy as a contemporary practice that expands the role of the pharmacist in direct patient care.

#### Clinical Pharmacology

This course will focus on the knowledge of appropriate dispensing, prescribing, and administration of medications in various clinical settings.

#### Drug-drug Interactions and Adverse Drug Reactions

The course will focus on relevant, new interpretations, explanations or information on potential drug/food/herbal supplements and chemical compounds, interactions and adverse/toxic effects when prescribing two or more drugs for simultaneous use.

#### Pharmacotherapeutics

This course will focus on the integration of the patho-physiologic abnormalities of disease states with concepts of drug action and therapy. State-of-the-art pharmacotherapy will be reviewed with pertinent pathophysiology and pharmacology.

#### Immunotherapeutics

The course deals with the pharmacology, therapeutic use, design, production and ethical appropriation of immunologic agents, engineered drugs, and biotechnological products aimed at inducing, enhancing, or suppressing an immune response.

#### Sterile Preparations and Parenteral Admixtures

The course deals with the therapeutics of clinical conditions requiring parenterally administered drug products and sterile preparations. The course includes determination of important pharmacokinetic parameters in parenteral therapy, indications for parenteral administration of drugs, institutional and regulatory requirements for quality assurance of injectable and other sterile products as compounded or manufactured.

#### Clinical Pharmacokinetics

The course deals with the discipline that describes the time-course of the movement of a drug into, around and out of the body. It deals with the relationship of the movement of the drug throughout the body, the processes affecting it and the synthesis of this information to influence clinical decisions.

#### Biological Products and Specialties

A study of the chemical, physical and biochemical properties of hormones, vitamins, and other nutritional products relevant to pharmaceutical practice. Consideration of the pharmaceutical aspects of the biological preparation in current clinical use, including production of bacterial and virus vaccines, toxoids, and analogous products (such as allergenic extracts), serum, plasma, and other blood derivatives for human or veterinary use, other than in vitro and in vivo diagnostic substances.

#### Advanced Pharmaceutical Medicinal Chemistry of Natural Products

The course deals with chemical characterization of naturally occurring medicinal compounds, structure, properties, synthesis, reactions and the correlation between chemical structure of bioactive constituents

and biological activity and its clinical application, and current therapeutic agents.

#### Modern Techniques in Pharmaceutical Chemistry

The course deals with the principles underlying modern analytical techniques specifically spectrophotometric, chromatographic, electrometric techniques and other special methods of pharmaceutical analysis.

#### Advanced Phytochemistry

The course deals with the development of microscopic and macroscopic diagnostic features, chromatographic and chemo-profiling studies of natural sources. It also includes pharmacological studies to ascertain efficacy of herbal extracts/formulations as per their ethno pharmacological claims. Acute, sub-acute and chronic toxicity studies to ascertain safety of herbal extracts/formulations. Considerations in herbal formulations and development will also be discussed.

#### Advanced Pharmacognosy and Phytotherapy

The course deals with comprehensive view of taxonomic organization of medicinal plants, ethnopharmacological actions and therapeutic applications of herbal products, molecular definition of modes of actions of phytocomplexes, and the contribution of herbal medicines to the rational basis for modern therapy.

#### Advanced Biochemistry (Biomolecules)

The course covers in detail the molecular basis of life, which includes the chemistry of biomolecules, structure function relationship, transformation of matter and energy, storage of genetic information, accession and manipulation.

#### Isolation of Natural Products and Structural Analysis

The course deals with the general methods of extraction, bioassay-guided fractionation, purification and structure determination of natural products (plants, animals, microorganisms) for pharmaceutical use and for other purposes. Principles of various analytical techniques and methodologies in drug research and development such as microplate UV-VIS, IR, HPLC, GC-MS, LC-MS and NMR are applied in studying organic molecules of interest

#### Advanced Pharmaceutical Care Practice

A course which forms a framework with reference to comprehensive pharmaceutical care as a patient-centered practice and the key-roles pharmacists assume in relationship to patient-centered care. This course includes topics which explain both the organizational and social context in which pharmacy is practiced, implementation and development of pharmaceutical care plan, and basic fiscal aspects of pharmacy practice. As part of the course requirement, actual patient chart review and interpretation to a specific hospital ward is essential for the development of a pharmaceutical care plan.

#### Effective Pharmacy Management

A course focused on the many aspects of effective pharmacy management in various settings. This will include practical application of principles, techniques, technology, and standards of practice

relevant to pharmacy operation. It traces the flow on how a pharmacy interfaces with the total health system operation.

### Social, Behavioral and Ethical Problems in the Practice of Pharmacy

The course is focused on the current national and international pharmaceutical problems encountered by the health professionals in their field of work. It will also involve discussions on the rationale, prevention, management and solutions of the problems from the legal or regulatory and ethical aspects.

### Regulatory Affairs

The course focuses on the practical applications of government regulations and strategies with special emphasis on the management of the registration process of pharmaceutical products, cosmetics, medical devices, and food products.

### Critical Analysis of Pharmaceutical Marketing

Critical Analysis of Pharmaceutical Marketing is a course designed to acquaint students with critical aspects of drug development, marketing, utilization, and evaluative science. The goal of the course is to improve prescribing practices and the outcomes of drug therapy by educating health professionals at all levels of training about the drug development and approval process; making health professionals aware of pharmaceutical industry marketing practices and assisting them in developing the knowledge and skills to evaluate those marketing techniques; and providing examples and strategies for evaluating existing sources of drug information, and for accessing unbiased sources of information about drugs. A case study on critical analysis of outcomes of drug therapy is a requirement of this course.

### Advanced Pharmacy Informatics

This course connects data's creation and relationship to information, followed by the constitution of knowledge and its use in the provision of patient care. This course will focus on two aspects such as the Clinical Trials and Pharmacy Informatics. The Clinical Trials aspect introduces the students to clinical trial design and focuses on randomized controlled trials as the primary method of generating therapeutic evidence.

### Statistical Quality Assurance

Statistical quality assurance is a course that ensures confidence on the proper implementation of quality programs according to good manufacturing practices. The desired characteristics of materials, methods, machines and personnel are consistently and reliably met through mathematical data evaluation of attributes and variables.

### Advanced Pharmaceutical Quality Control

This course deals with the rationale, principles and methods of controlling the quality of pharmaceutical raw materials and preparations. It focuses on analytical test methods with corresponding instrumentation, statistical quality control for acceptance sampling during inspection, in-process and finished product control as integral parts of a valid evaluation process.

### New Product Development and Formulation

Introduces the students to the different classes of products developed for human and non-human use. It focuses on the practical application of principles, regulations and methods in the development of new products. It traces the flow of activities from quality control of active pharmaceutical ingredients, preformulation, pharmacologic studies (non-clinical), production phase and clinical studies (phase I to post-marketing phase IV). Special emphasis is on plant products. It presents analysis and assay methods of the active ingredients from compendial monographs and research journals. It deals with both descriptive research and experimental methods.

### COGNATE: (3 UNITS)

Any course which has a direct bearing on one's thesis.

### TERMINAL REQUIREMENTS: (9 UNITS)

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

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*

ALETH THERESE L. DACANAY, Ph.D.

*Program Lead*

Pharmacy & Medical Technology

#### PROFESSORIAL STAFF

Jovencio G. Apostol, Ph.D.

Agnes L. Castillo, Ph.D.

Mary Jho-Anne T. Corpuz, Ph.D.

Aleth Therese L. Dacanay, Ph.D.

Marina O. Osi, Ph.D.

Librado Santiago, Ph.D.

Rosalinda C. Solevilla, Ph.D.

Ross Vasquez, Ph.D.

Mafel Ysrael, Ph.D.

### Summary of Program Requirements

Degree Requirements	units
Prerequisite Courses	6
Core Courses	9
Specialization Courses	15
Cognate Courses	3
Written Comprehensive Exam	--
Thesis Writing I	3
Thesis Writing II	3
Thesis Writing III	3
<b>TOTAL</b>	<b>42</b>



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

MASTER OF SCIENCE IN  
**PHARMACY**

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