MASTER OF SCIENCE IN CHEMICAL ENGINEERING

WITH SPECIALIZATION IN BIOMEDICAL ENGINEERING

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.

APPLICATION PROCEDURE

A. Fill out the Application Form and collate all requirements. Application forms are available at the UST Graduate School Office (Ground floor, Thomas Aquinas Research Complex), UST Admissions Office & at the UST Graduate School website – http://www.ust.edu.ph
B. Submit the accomplished forms and requirements at the Graduate School Office as per instructions in the application form. The application for admission is until October 15 for second semester enrollees, April 5 for Summer enrollees, and May 25 for first semester enrollees.

GENERAL REQUIREMENTS:

Certified true copy of Transcript of Records; one (1) recent colored passport-size photo; document(s) certifying favorable Board Exam results; scholarship documents (if applicable); Two (2) Referral Forms: One (1) from the current/immediate superior (or College Dean, in the case of newly graduated applicants); and (1) from a former professor in a specialization/major subject in College.

For Foreigners:

Aside from the General Requirements, English Proficiency certification (TOEFL) and Foreign Student documentations, such as Student visa, are needed.

ADMISSION REQUIREMENTS

Bachelor's Degree in: Chemical Engineering, Electronics Engineering, and Medical Physics, with a general weighted average of 2.00 (85% or B) or better. Students with general weighted average below 2.00 but of excellent research track record may be considered for admission, subject to a satisfactory referral and other admission criteria.

PROGRAM RATIONALE:

- 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.
- Produce quality research in the various fields of knowledge that is internationally recognized.
- Develop and integrate the intellect and creativity through excellence in instruction, research and extension work.
- Hone the professional and social skills and critical capabilities of the graduate students enabling them to become responsible leaders in their respective careers and communities.
- Produce graduates who are acknowledged experts who are internationally recognized through information dissemination.
- Produce graduates who participate actively in addressing issues and solving problems of global impact through research and information dissemination.
- Produce graduates that can evaluate and qualify opportunities in sharing their gained expertise to serve the large community through extension works and community service.
- Exhibit self-motivation, self-initiated program and plans of graduates to continue updating themselves with the current and sustain their yearnings on new technologies and innovative ideas.
- Build partnerships and linkages between the Graduate School and academic institutions, industry and government entities at the local and international level.
- Enhance the expertise of the graduates as they visibly convey their professional works in both local and global community.

CURRICULUM

Master of Science in Chemical Engineering

Prerequisite/Institutional Required Courses (6 units)

St. Thomas and Critical Thinking
Research Methods *(Research in Chemical Engineering and Allied Fields)*

Engineering Sciences (6 units)

Advanced Engineering Mathematics
Advanced Numerical Analysis

Core Courses (9 units)

Advanced Transport Phenomena
Advanced Chemical Reaction Engineering
Advanced Chemical Engineering Thermodynamics / Molecular Thermodynamics
Advanced Fluid Mechanics
Process Control
Separation Processes

Specialization Courses (9 units)

Biomedical Engineering

Physiological Systems
Biomedical Engineering
Mathematical Methods for Chemical and Biomedical Engineering Analysis
Biochemical Engineering
Genetic Engineering
Chemical and Physical Basis of Bioimaging and Biosensing
Engineering Principles of Drug Delivery
Advanced Biomaterial

Materials Science and Engineering

Materials Science and Engineering
Sensors Technology
Nanotechnology
Advanced Materials Thermodynamics
Structure and Properties of Materials
Introduction to Materials Characterization
Composite Materials
Principles of Corrosion and Electrochemical Processes

Environmental Engineering

Environmental Engineering and Management
Water and Wastewater Characterization
Sustainable Water Resources Development
Physical and Chemical Processes for Hazardous Waste Treatment
Transport of Chemicals in Environmental Systems
Air Pollution Control
Water and Wastewater Management
Solid Waste Management

Energy Engineering

Energy Engineering / Renewable Energy / Conventional Energy / Energy Management
Energy Storage
Biomass Energy Resources
Energy Systems
Energy Analysis and Policy
Sustainable Energy Economics
Fuels and Combustion Engineering

Food Engineering

Advanced Food Engineering
Membrane Technology Applied to the Natural Production Process and Functional Foods
Physical Separations
Process Engineering in the Food Industry
Automation and Control of Food Processes
Advanced Process Calculations

Metallurgical Engineering

Hydrometallurgy Techniques
Introduction to Proven Metallurgy
Metallurgical Chemistry Techniques
Minerals Processing Techniques – Comminution and Separation
Minerals Processing Techniques – Flotation and Decuatering
Mining and Minerology
Responsible Mining

COGNATE COURSES (Optional)

Applied Statistics
Engineering Education
Chemistry
Biology
Medical Physics
Food Science
Entrepreneurship
Special Topics/ Seminars

OTHER REQUIREMENTS

Written Comprehensive Examination
Thesis Writing 1
Thesis Writing 2

Total = 36 Units

UST GRADUATE SCHOOL ADMINISTRATION OFFICIALS AND FACULTY SET-UP

MARILU R. MADRUNIO, Ph.D.
Dean

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

JOCELYN AGCAOILI, Ph.D.
Director, Center for Continuing Professional Education & Development

ERIC B. ZERRUDO, MA
Director, Center for Conservation of Cultural Property and Environment in the Tropics

SUSAN F. BALDIA, Ph.D
Supervising Scientist, Science Laboratories

MARIA NATALIA R. DIMAANO, Ph. D. (Chem. E.)
Consultant for Engineering

PROFESSORIAL STAFF

Core Faculty

Michael Francis Benjamin, Ph.D. (ChE)
Carlota B. Decena, Ph. D. (Math)
Maria Natalia R. Dimaano, Ph. D. (Ch E)
Berndhart Egwolf, Ph.D. (Math)
Larry S. King, M. D.
Alberto A. Laurito, M.Sc. (Envi. E.)
Evelyn R. Laurito, Ph. D. (Envi. Sci.)
Philipina A. Marcelo, Ph.D. (Food Sci. & Tech)
Lola Domnina B. Pestaño, Ph.D. (ChE)
Edna C. Quinto, Ph. D. (Chem)
Librado A. Santiago, Ph. D. (Med. Sci.)
Oliver Villaflores, Ph.D. (Biochem)

Adjunct Faculty

Eufemio G. Barcelon, Ph. D. (Food E.)
Christina A. Binag, Ph. D. (Chem)
Jojo F. Blanza, M. Eng. (Electronics E.)
Paul Cordero, M. Sc. (Biochem)
Angelo R. dela Cruz, M. Eng. (Electronics E.)
Ernesto O. Dela Cruz, (ChE)
Armando T. Quitain, Ph.D. (ChE)
Raymond L. Rosales, M. D.
Fortunato B. Sevilla III, Ph.D. (Analytical Instru.)
Allan N. Soriano, Ph.D. (ChE)
Bernard John V. Tongol, Ph. D. (Chem. E.)
Mafel C. Ysrael, Ph.D. (Chem)

SUMMARY OF COURSE REQUIREMENTS

Requirements	Units
Required Courses	6
Engineering Sciences	6
Core Courses	9
Specialization Courses	9
Written Comprehensive Exam	--
Thesis Writing I	3
Thesis Writing II	3
TOTAL Units	**36**

SCHOOL CALENDAR

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

Summer 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
or write to:
The Dean/Faculty Secretary
UST Graduate School
España, Manila, Philippines 1008

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THE CATHOLIC UNIVERSITY OF THE PHILIPPINES
MANILA, PHILIPPINES
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