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 8, 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
- Physical Systems
- Biomedical Engineering
- Mathematical Methods for Chemical and Biomedical Engineering Analysis
- Biocompatible 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

Total = 36 Units

Cognate Courses (Optional)
- Applied Statistics
- Engineering Education
- Chemistry
- Biology
- Medical Physics
- Food Science
- Entrepreneurship
- Special Topics/Seminars

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 – Flotation and Decuatering
- Mining and Mineralogy
- Responsible Mining

OTHER REQUIREMENTS
- Written Comprehensive Examination
- Thesis Writing 1
- Thesis Writing 2

Air Pollution Control
- Water and Wastewater Management
- Solid Waste Management
SUMMARY OF COURSE REQUIREMENTS

<table>
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<th>Requirements</th>
<th>Units</th>
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<tr>
<td>Required Courses</td>
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<tr>
<td>Engineering Sciences</td>
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<td>Core Courses</td>
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<td>Specialization Courses</td>
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<td>Written Comprehensive Exam</td>
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<td>Thesis Writing II</td>
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<td><strong>TOTAL Units</strong></td>
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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,
Tel-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

PROFESSORIAL STAFF

Core Faculty
Michael Francis Benjamin, Ph.D. (ChE)
Carlota B. Decena, Ph. D. (Math)
María Natalia R. Dimaano, Ph. D. (Chem)
Bernhart Egwolf, Ph.D. (Math)
Larry S. King, M. D.
Alberto A. Laurito, M.Sc. (Envi. E.)
Evelyn R. Laurito, Ph. D. (Envi. Sci.)
Philippa A. Marcelo, Ph.D. (Food Sci. & Tech)
Lola Domninga B. Pestana, Ph.D. (ChE)
Edna G. 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.)