



Republic of the Philippines
BATANGAS STATE UNIVERSITY
The National Engineering University

Alangilan Campus
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College of Engineering Technology – Graduate School

Master of Technology
Academic Year 2022-2023
Reference: CHED Memorandum Order No. 15 Series of 2019 and
Final Draft of CMO – PSG for graduate degree programs in Engineering

Program Description

The Master of Technology (MTech) is a degree specializing in information technology, business and technology, engineering technology or technology management. Individuals may be taught how to develop new products, build and manage technical teams, and start and run tech companies.

The skills learned in a Master in Technology program may allow graduates to pursue advanced careers in the field. Students often develop specialized organizational, analytical and decision-making skills that help them stand out from the crowd.

Careers in technology are varied and far-reaching. Graduates might pursue a career in information risk management with a public accounting firm. Students may also find employment as computer analysts, computer programmers, support representatives or systems analysts. A Master in Technology tends to prepare individuals for high-level careers in business technology leading projects, departments and even entire organizations.

Program Educational Objectives

PERFORMANCE INDICATIONS (PI) FOR PEOs	
PI	Program PEO is considered attained of at least 95% of graduates achieved at least one (1) PI for each PEO
PEO	PEO with Statements of Performance Indicators (PI)
PEO1	Specialist. Successfully practice as Technology Professional for the welfare of the society.
PI1	<i>Graduates are involved in operations planning with contribution towards improving processes.</i>
PI2	<i>Graduates are able to undertake Technological activities in a way that contributes to sustainable development.</i>
PI3	<i>Graduates are actively involved in designing of new systems and processes and/or providing consultancy and advice to either internal or external customers.</i>
PI4	<i>Graduates are involved in managing projects or operations and mentoring junior engineers to perform design work.</i>
PEO2	Professionalism and Leadership. Demonstrate a high-degree of professionalism at all times.
PI1	<i>Graduates have planned for effective project implementation through managing the planning, budgeting and organization of tasks, people, and resources.</i>
PI2	<i>Graduates have managed teams and developed staff to meet changing technical and managerial needs.</i>
PI3	<i>Graduates are developing or have started a company or partnership business.</i>
PI4	<i>Graduates have managed continual quality improvement.</i>
PEO3	Lifelong Learning. Engage in lifelong learning through further studies, research, certifications, promotions, and other personal and professional development activities.



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PI1	<i>Graduates are currently furthering or have furthered their studies.</i>
PI2	<i>Graduates deal with and comply with relevant codes of conduct and manage and apply safe systems of work.</i>
PI3	<i>Graduates carry out continual professional development necessary to maintain and enhance competence in their own areas of practice, including a personal Development Action Plan.</i>

Student Outcomes

STUDENT OUTCOMES (SO) STATEMENTS	
PI	An SO is considered attained if at least 60% of the students achieved at least 75% in the assessment of the particular SO.
SO	Student Outcomes (SO) With Statements of Performance Indicators (PI)
SOa	Technology Tools Usage. Demonstrate a comprehensive and broad understanding of technology principles and apply highly advanced systematic knowledge and skills on this specific discipline;
PI1	<i>An ability to acquire new knowledge using appropriate learning strategies</i>
PI2	<i>An ability to apply new knowledge as needed</i>
SOb	Technology Systems. Analyze, synthesize, create and evaluate technology systems;
PI1	<i>An ability to identify complex technology problems.</i>
PI2	<i>An ability to formulate and solve complex technology problems.</i>
SOc	Design of Solutions. Design components, devices and systems to meet specified technology needs under real – world constraints;
PI1	<i>Ability to apply technology design to produce solutions that meet specified needs</i>
PI2	<i>Ability to make final selection considering multiple design constraints</i>
SOd	Communication. Communicate technical knowledge effectively - orally, visually, graphically and in writing on technical multidisciplinary activities;
PI1	<i>Ability to effectively communicate orally, in writing, or visually, as appropriate, in a technical audience</i>
PI2	<i>Ability to effectively communicate orally, in writing, or visually, as appropriate, in a non-technical audience</i>
SOe	Leadership and Teamwork. Function effectively as an individual, a team member, or as a leader in diverse work environments;
PI1	<i>An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment to establish goals</i>
PI2	<i>An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment to plan tasks</i>
SOf	Contribution. Contribute to the generation, dissemination and preservation of technological knowledge, methodologies, techniques, and processes;
PI1	<i>Perform knowledge generation through systematic process.</i>
PI2	<i>Ability to disseminate and preserve engineering knowledge through precise methodologies and techniques.</i>
SOg	Professional Development. Engage in professional development and life-long learning;
PI1	<i>Ability to create and maintain a positive attitude to learning both for personal and professional development</i>
PI2	<i>Ability to enhance understanding that will provide better opportunities and improvement of the quality of life</i>
SOh	Professionalism. Conduct oneself within professional and ethical standards; and
PI1	<i>Ability to perform activities within professional standards</i>



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PI2	<i>Ability to perform activities within ethical standards</i>
SOi	Independent Research. Perform independent scientific research that results in the creation of new technological knowledge.
PI1	<i>Ability to perform independent scientific research related to technology application</i>
PI2	<i>Ability to conduct a study that results in the innovation in technology application.</i>

Total Number of Units

Courses	Number of Units
Core Courses	6
Major Courses	12
Elective Courses	6
Thesis Writing	6
Total No. of Units	30

Curriculum Outline

Core Courses (6 units)		
Course Code	Course Title	Credit Units
MOT 501	Technological Research Methodology	3
MOT 502	Philosophy of Technology	3

Major Courses (12 units)		
Course Code	Course Title	Credit Units
MOT 503	Nanotechnology	3
MOT 504	Environmental Technology for Sustainable Development	3
MOT 505	Artificial Intelligence and Machine Learning Applications	3
MOT 506	Telecommunications Technology	3

Elective Courses (6 units)		
Course Code	Course Title	Credit Units
MOT 507	Strategic Management of Technology	3
MOT 508	Information Security and Technology Controls	3
MOT 509	Special Topics in Technology Management	3
MOT 510	Global Technology Issues	3
MOT 511	Advanced Manufacturing Technology	3

Thesis Writing (6 units)		
Course Code	Course Title	Credit Units
MOT 512	Seminar in Thesis Writing	3
MOT 513	Thesis Writing	3



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Course Description

Course Code	Course Title	Unit	Course Description
MOT 501	Technological Research Methodology	3	This course deals with the principles and practices essential in the accomplishment of a graduate research in technology. The learners will be generally introduced to the kinds and methods of research and relevant statistics. Particularly, they will be required to focus their work on the applied research type. Applied research is a structure of efficient investigation involving the practical application of science. It uses some part of accumulated theories, knowledge, methods, and techniques for a specific purpose. The course aims to help learners compose a research proposal by guiding them with the whole research process and identify the appropriate statistical tools for the analysis of data to be collected.
MOT 502	Philosophy of Technology	3	This course deals with the nature of technology and its role in our lives and our society. It focuses on four major sets of questions: (1) What is technology? How do we define it, study it, understand its relation to nature and humanity? (2) What is the relation of science to technology? Are they wholly distinct, or are modern science technology best understood under the shared heading MT of “technoscience”. What can we learn about one from the other? (3) What is the impact of technology on society and ethics? How should we think about this impact? Where is technology beneficial, and where is it problematic? (4) What is the impact of technology on human lives, ordinary, cognitive, and aesthetic? Does it degrade or improve? Does it make us smarter or hold us back? Do art and technology serve fundamentally different goals, or do they have important features in common?
MOT 503	Nanotechnology	3	Nanotechnology (NT) is a rather young discipline, which came up in the nineties and now has gained so much importance. Nanotechnology is envisioned to change our lives and society more than computer technology and electricity have done together. The course will provide an overview of nanotechnology and shall introduce tools and principles relevant at the nanoscale dimensions. It will discuss current and future nanotechnology applications in engineering materials, physics, chemistry, biology, electronics and energy.
MOT 504	Environmental Technology for Sustainable Development	3	Environmental Technology for Sustainable Development is a postgraduate Technology course intended for mid-career professionals with knowledge and tools to holistically analyze environmental



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			problems that require a thorough understanding of the complex interrelationships between science, technology, policy, and management. The course is beneficial to train the professionals in the social implications of environmental issues, particularly in relation to technologies as potential solutions.
MOT 505	Artificial Intelligence and Machine Learning Applications	3	This course provides graduate students the knowledge and skills on information system security in all functional levels within an organization or enterprise. To this end, the course addresses a range of topics, each of which is vital to securing the modern enterprise. These topics include design of policies, enterprise roles, security metrics, risk management, standards and regulations, physical security, business continuity and disaster recovery.
MOT 506	Telecommunications Technology	3	Telecommunication Technology is a postgraduate Technology course intended for mid-career professionals which provides training in the field of telecommunications. The principles of wireless communication theory are covered with emphasis on the essential concept delivery to non-major learners in the easiest way. Then, it will be covered how such principles are realized and how multimedia services can be delivered in practical LTE cellular systems by which learners are connected and enjoys together in their lives.
MOT 507	Strategic Management of Technology	3	The strategic management of technology is an important contributor to organizational performance and competitiveness. It creates value, assists differentiation, enhances productivity, and guides creativity and initiative. This course aims to prepare students for different types of management tasks related to technology and innovation. This is done by making students familiar with a set of theories and tools used for strategic management of technological innovation. Besides theoretical understanding, a major goal of the course is to teach students how to analyze and deal with complex innovation-related challenges typically faced by managers. The ultimate aim of the course is to help students work more effectively and successfully in their professional careers.
MOT 508	Information Security and Technology Controls	3	This course provides graduate students the knowledge and skills on information system security in all functional levels within an organization or enterprise. To this end, the course addresses a range of topics, each of which is vital to securing the modern enterprise. These topics include design of policies, enterprise roles, security metrics, risk management, standards and regulations, physical security, business continuity and disaster recovery.



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MOT 509	Special Topics in Technology Management	3	The course emphasizes innovation and creativity as well as evaluation and analysis of the new technology. It also introduces concepts and frameworks for analyzing how firms can create, commercialize and capture value from technological products and services. The concepts and frameworks are also useful in learning how to manage innovation within a corporation, how to protect an invention and how to deal with rapid changes in the technological environment.
MOT 510	Global Technology Issues	3	Information technologies have been deployed as a key competitive advantage by multinational and transnational businesses throughout the world. They have performed wonders for individuals, societies, and nations worldwide. Nevertheless, they have also generated numerous global issues. This course will discuss these issues: interruption of traditional business models, threats to privacy, cyberbullying, unethical behavior in the workplace in a digital world, undesirable impact of texting, new challenges of polling, online piracy, threats to national security, threats to human jobs, and obstacles to information technology innovations. Upon ending this course, the students should be able to understand that every new technology has tradeoffs, and recognized issues lead to improvements and more innovations.
MOT 511	Advanced Manufacturing Technology	3	Advanced manufacturing technology encompasses the use of innovative technology to improve products or processes that drive innovation. It covers two types of technologies: process technology that is used to produce any of other advanced technologies, and process technology that is based on robotics, automation technology or computer-integrated manufacturing. For the former, such process technology typically relates to production apparatus, equipment and procedures for the manufacture of specific materials and components. For the latter, process technology includes measuring, control and testing devices for machines, machine tools and various areas of automated or IT-based manufacturing technology.
MOT 512	Seminar in Thesis Writing	3	The course serves as the first part of the students' research project. This aims to hone students' capacity to plan independent research and to communicate this in a research proposal. Likewise, the concluded research proposal composed of The Problem, Review of Related Literature and Methodology must be presented before the panel for oral examination.
MOT 513	Thesis Writing	3	The course serves as the first part of the students' research. Likewise, this requires students to propose a



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			topic and write a research proposal covering the research literature and studies, the methodology and the expected results of the study. This Dissertation Research proposal is to be presented to a panel of examiners as part of their oral examination.
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Curriculum Mapping
Reference: CMO No. 15, S. 2019

Course Code	Course	Credit Units	Student Outcomes								
			a	b	c	d	e	f	g	h	i
	Core Courses (6 Units)										
MOT 501	Technological Research Methodology	3		D		D					D
MOT 502	Philosophy of Technology	3	D				D			D	
	Major Courses (12 Units)										
MOT 503	Nanotechnology	3	D						D	D	
MOT 504	Environmental Technology for Sustainable Development	3	D			D				D	
MOT 505	Artificial Intelligence and Machine Learning Applications	3	D	D				D			
MOT 506	Telecommunications Technology	3			D	D			D		
	Elective Courses (6 Units)										
MOT 507	Strategic Management of Technology	3		D			D	D			
MOT 508	Information Security and Technology Controls	3	D	D						D	
MOT 509	Special Topics in Technology Management	3		D				D	D		
MOT 510	Global Technology Issues	3	D				D		D		
MOT 511	Advanced Manufacturing Technology	3					D	D		D	
	Thesis Writing (6 Units)										
MOT 512	Seminar in Thesis Writing	3	D	D	D						D
MOT 513	Thesis Writing	3						D	D		D

Legend: **I** – Introduced, **R** – Reinforced, **D** – Demonstrate

Program of Study

Course Code	Title of the Course	Credit Units	Hrs. Lec	Hrs. Lab	Category
Year 1					
First Semester					
MOT 503	Nanotechnology	3	3	-	Major Course
MOT 506	Telecommunications Technology	3	3	-	Major Course
	Elective 1	3	3	-	Elective Course
Second Semester					
MOT 502	Philosophy of Technology	3	3	-	Core Course
MOT 504	Environmental Technology for Sustainable Development	3	3	-	Major Course
	Elective 2	3	3	-	Elective Course



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Midterm					
MOT 501	Technological Research Methodology	3	3	-	Core Course
MOT 505	Artificial Intelligence and Machine Learning Applications	3	3	-	Major Course
Comprehensive Examination					
Year 2					
First Semester					
MOT 512	Seminar in Thesis Writing	3	3	-	Thesis Writing
Second Semester					
MOT 513	Thesis Writing	3	3	-	Thesis Writing

Note: The students in the Master of Technology program are only required to take two (2) electives from the list of available options.