Republic of the Philippines
BATANGAS STATE UNIVERSITY
The National Engineering University
Alangilan Campus
Golden Country Homes, Alangilan, Batangas City, Batangas, Philippines 4200
Tel Nos.: (+63 43) 425-0139; (+63 43) 425-0143 loc. 2103
E-mail Address: gs.cit@g.batstate-u.edu.ph | Website Address: http://www.batstateu.edu.ph

College of Engineering Technology – Graduate School

Doctor 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 Doctor of Technology (DTech) is a research degree with a particular orientation to the development of professional practice. The focus of the program is on critical analysis, research and evaluation of complex industrial issues and challenges.

It enables graduates to obtain an advanced level of knowledge in specialized fields of study related to specific disciplines. It provides the opportunity for experienced professionals to undertake coursework and research on an advanced project which would be of benefit to them in their career development.

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	*Graduates are involved in operations planning with contribution towards improving processes.*
PI2	*Graduates are able to undertake Technological activities in a way that contributes to sustainable development.*
PI3	*Graduates are actively involved in designing of new systems and processes and/or providing consultancy and advice to either internal or external customers.*
PI4	*Graduates are involved in managing projects or operations and mentoring junior engineers to perform design work.*
PEO2	**Professionalism and Leadership.** Demonstrate a high-degree of professionalism at all times.
PI1	*Graduates have planned for effective project implementation through managing the planning, budgeting and organization of tasks, people, and resources.*
PI2	*Graduates have managed teams and developed staff to meet changing technical and managerial needs.*
PI3	*Graduates are developing or have started a company or partnership business.*
PI4	*Graduates have managed continual quality improvement.*
PEO3	**Lifelong Learning**. Engage in lifelong learning through further studies, research, certifications, promotions, and other personal and professional development activities.
PI1	*Graduates are currently furthering or have furthered their studies.*
PI2	*Graduates deal with and comply with relevant codes of conduct and manage and apply safe systems of work.*

College of Engineering Technology – Graduate School

PI3	*Graduates carry out continual professional development necessary to maintain and enhance competence in their own areas of practice, including a personal Development Action Plan.*

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	*An ability to acquire new knowledge using appropriate learning strategies*
PI2	*An ability to apply new knowledge as needed*
SOb	**Technology Systems.** Analyze, synthesize, create and evaluate technology systems;
PI1	*An ability to identify complex technology problems.*
PI2	*An ability to formulate and solve complex technology problems.*
SOc	**Design of Solutions.** Design components, devices and systems to meet specified technology needs under real – world constraints;
PI1	*Ability to apply technology design to produce solutions that meet specified needs*
PI2	*Ability to make final selection considering multiple design constraints*
SOd	**Communication.** Communicate technical knowledge effectively - orally, visually, graphically and in writing on technical multidisciplinary activities;
PI1	*Ability to effectively communicate orally, in writing, or visually, as appropriate, in a technical audience*
PI2	*Ability to effectively communicate orally, in writing, or visually, as appropriate, in a non-technical audience*
SOe	**Leadership and Teamwork.** Function effectively as an individual, a team member, or as a leader in diverse work environments;
PI1	*An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment to establish goals*
PI2	*An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment to plan tasks*
SOf	**Contribution**. Contribute to the generation, dissemination and preservation of technological knowledge, methodologies, techniques, and processes;
PI1	*Perform knowledge generation through systematic process.*
PI2	*Ability to disseminate and preserve engineering knowledge through precise methodologies and techniques.*
SOg	**Professional Development.** Engage in professional development and life-long learning;
PI1	*Ability to create and maintain a positive attitude to learning both for personal and professional development*
PI2	*Ability to enhance understanding that will provide better opportunities and improvement of the quality of life*
SOh	**Professionalism.** Conduct oneself within professional and ethical standards; and
PI1	*Ability to perform activities within professional standards*
PI2	*Ability to perform activities within ethical standards*

College of Engineering Technology – Graduate School

SOi	**Independent Research.** Perform independent scientific research that results in the creation of new technological knowledge.
PI1	*Ability to perform independent scientific research related to technology application*
PI2	*Ability to conduct a study that results in the innovation in technology application.*

Total Number of Units

Courses	Number of Units
Core Courses	9
Major Courses	9
Elective Courses	6
Dissertation Writing	12
Total No. of Units	**36**

Curriculum Outline

Core Courses (9 units)		
Course Code	**Course Title**	**Credit Units**
DOT 601	Legal Bases and Procedures in Technology	3
DOT 602	Modern Technology Trends in Data Analytics	3
DOT 603	Technology Leadership and Innovation Management	3

Major Courses (9 units)		
Course Code	**Course Title**	**Credit Units**
DOT 604	Advanced Engineering Design in Area of Specialization	3
DOT 605	Advanced Product Planning and Development	3
DOT 606	Artificial Intelligence for Technology Development	3

Elective Courses (6 units)		
Course Code	**Course Title**	**Credit Units**
DOT 607	Renewable Energy and Green Technology	3
DOT 608	Environmental Control Strategies	3
DOT 609	Global Perspectives on Emerging Technologies	3
DOT 610	Advanced Strategic Planning and Management	3

Dissertation Writing (12 units)		
Course Code	**Course Title**	**Credit Units**
DOT 611	Dissertation Writing I	6
DOT 612	Dissertation Writing II	6

Course Description

Republic of the Philippines
BATANGAS STATE UNIVERSITY
The National Engineering University
Alangilan Campus
Golden Country Homes, Alangilan, Batangas City, Batangas, Philippines 4200
Tel Nos.: (+63 43) 425-0139; (+63 43) 425-0143 loc. 2103
E-mail Address: gs.cit@g.batstate-u.edu.ph | Website Address: http://www.batstateu.edu.ph

College of Engineering Technology – Graduate School

Course Code	Course Title	Unit	Course Description
DOT 601	Legal Bases and Procedures in Technology	3	Knowledge of legal principles relating to technology is significant to every practicing technologist in the society. This course covers the legal bases and procedures in technology. Students will be provided with knowledge on obligations, contracts, existing laws, legal concepts, issues and procedures related to technology. Several legal cases will be explored to develop deeper understanding on how laws and procedures are applied in real life settings.
DOT 602	Modern Technology Trends in Data Analytics	3	This course deals with the perspectives, approaches and methodologies in technology research including the concepts and procedures of descriptive and inferential statistics. Students will develop competence in reading and understanding research and statistics topics from sources such as texts, dissertations, journals, or technical reports.
DOT 603	Technology Leadership and Innovation Management	3	This course focuses on building the foundational leadership skills in technology subject matter expertise, communication, goal management, asset alignment, team organization and project supervision. It will equip students with the skills needed to succeed in leadership and managerial roles in diverse organizations.
DOT 604	Advanced Engineering Design in Area of Specialization	3	This course aims to develop expertise of engineering designers who can combine knowledge from different areas and produce sustainable design. Integration of mechanical, electrical, electronic and control knowledge into a single process or system is challenging and this course will allow the students to appreciate the complexity of modern engineering design. This course therefore provides in-depth discussion, application and analysis of various design requirements, the integration of multiple realistic constraints, applicable engineering standards and design trade-offs.
DOT 605	Advanced Product Planning and Development	3	Product development is the life-blood of companies and societies. The success of a new product typically requires considerable resources. Hence, product planning is essential to ensure success of product development. This course provides the students regarding product planning and development from a strategic perspective. To enhance students' understanding of factors affecting the implementation of strategic plans, this course highlights methods for the management of new products in companies. The course focuses on different stages in the new products process and includes assignments on how to develop new marketing offerings that fit current and future

College of Engineering Technology – Graduate School

			demands in the market. The students will, therefore, gain knowledge of how to set up and manage the new product development process, and how to avoid common pitfalls.
DOT 606	Artificial Intelligence for Technology Development	3	This course will expose students to some of the most innovative ICTD solutions to government, businesses, industries and other organizations. Students will be familiarized with a variety of theoretical concepts pertaining to ICT. Through detailed case studies, students will be exposed to a wide range of methods that are employed to study ICTD projects. Ultimately, students will also be encouraged to critically examine the notion of development, how it can be achieved, and whose needs it meets best.
DOT 607	Renewable Energy and Green Technology	3	This course provides a graduate-level understanding of the conversion principles and technology behind various renewable energy sources. It also examines the issues involved in the integration of various renewable energy sources and their economics for heat, power, and transportation needs. Based on the technical and sustainability challenges, the future outlook for each of the sources and systems is discussed.
DOT 608	Environmental Control Strategies	3	This course will help the students: Identify sources of air, water and land pollution associated with major industries, understand the impacts to the environment and devise strategies to control and prevent pollution; identify relevant legislation for environmental control and advise on strategies for compliance; understand and manage environmental risks of chemicals and hazardous substances; assess and manage environmental noise problems; Assess environmental health issues such as vector-borne disease and food-borne disease and devise appropriate vector control and food hygiene measures and Systematically address waste production and strategies to minimize and manage the waste stream.
DOT 609	Global Perspectives on Emerging Technology	3	This course deals with the study of systematic analysis of technology and its international dimensions, including the competencies needed to work internationally both here and abroad. The focus will be on the resources and competencies needed by business, industrial and technological personnel operating in the international context.
DOT 610	Advanced Strategic Planning and Management	3	This course will help the students to learn on how to set priorities, focus energy and resources, strengthen operations, ensure that employees and other stakeholders are working toward common goals, establish agreement around intended outcomes/results, and assess and adjust the organization's direction in response to a changing environment. It is a disciplined effort that produces fundamental decisions and actions that shape and guide what an organization is, who it serves, what it does, and why it does it, with a focus on the future. Effective

College of Engineering Technology – Graduate School

			strategic planning articulates not only where an organization is going and the actions needed to make progress, but also how it will know if it is successful.
DOT 611	Dissertation Writing I	3	The course serves as the first part of the students' dissertation. Likewise, this requires students to propose a topic and write a dissertation 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.
DOT 612	Dissertation Writing II	3	This course will provide a long time for students to continue their study by completing the results, findings, conclusions and recommendations. This is the time where they need to strengthen research findings through reviewing again related studies, collating and tabulating data from validated instruments and processing data using statistical tools. Likewise, students in this term are encouraged to consult their adviser or Dissertation Writing II instructor for proper guidance in their paper.

Curriculum Mapping

Course Code	Course	Credit Units	Student Outcomes								
			a	b	c	d	e	f	g	h	i
	Core Courses (9 Units)										
DOT 601	Legal Bases and Procedures in Technology	3	D						D	D	
DOT 602	Modern Technology Trends in Data Analytics	3						D	D		D
DOT 603	Technology Leadership and Innovation Management	3				D	D		D	D	
	Major Courses (9 Units)										
DOT 604	Advanced Engineering Design in Area of Specialization	3		D	D	D		D			
DOT 605	Advanced Product Planning and Development	3		D	D			D			
DOT 606	Artificial Intelligence for Technology Development	3	D	D	D			D			
	Elective Courses (6 Units)										
DOT 607	Renewable Energy and Green Technology	3	D	D		D					
DOT 608	Environmental Control Strategies	3	D	D				D		D	
DOT 609	Global Perspectives on Emerging Technologies	3	D	D				D			
DOT 610	Advanced Strategic Planning and Management	3		D			D		D		
	Dissertation Writing (12 Units)										
DOT 611	Dissertation Writing I	6			D	D		D			D
DOT 612	Dissertation Writing II	6			D	D		D			D

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

Program of Study

Republic of the Philippines
BATANGAS STATE UNIVERSITY
The National Engineering University
Alangilan Campus
Golden Country Homes, Alangilan, Batangas City, Batangas, Philippines 4200
Tel Nos.: (+63 43) 425-0139; (+63 43) 425-0143 loc. 2103
E-mail Address: gs.cit@g.batstate-u.edu.ph | Website Address: http://www.batstateu.edu.ph

College of Engineering Technology – Graduate School

Course Code	Title of the Course	Credit Units	Hrs. Lec	Hrs. Lab	Category
Year 1					
First Semester					
DOT 603	Technology Leadership and Innovation Management	3	3	-	Core Course
DOT 606	Artificial Intelligence for Technology Development	3	3	-	Major Course
	Elective 1	3	3	-	Elective Course
Second Semester					
DOT 601	Legal Bases and Procedures in Technology	3	3	-	Core Course
DOT 602	Modern Technology Trends in Data Analytics	3	3	-	Core Course
DOT 604	Advanced Engineering Design in Area of Specialization	3	3	-	Major Course
Midterm					
DOT 605	Advanced Product Planning and Development	3	3	-	Major Course
	Elective 2	3	3	-	Elective Course
Comprehensive Examination					
Year 2					
First Semester					
DOT 611	Dissertation Writing I	6	3	-	Dissertation Writing
Second Semester					
DOT 612	Dissertation Writing II	6	3	-	Dissertation Writing

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