

DOCTOR OF PHILOSOPHY

FIELD OF RESEARCH: ENGINEERING EDUCATION

PROGRAMME SPECIFICATIONS

The Doctor of Philosophy Field of Research: Engineering Education (PLPE) is offered on a full-time basis. The duration of study is in between minimum of three (3) years to a maximum of eight (8) years.

The assessment of the research program is based on the progress report, supervisor's evaluation, research proposal and viva.

General Information

1. Awarding Institution	Universiti Teknologi Malaysia		
2. Teaching Institution	Universiti Teknologi Malaysia		
3. Programme Name	Doctor of Philosophy		
4. Final Award	Doctor of Philosophy Field of research: Engineering Education		
5. Programme Code	PLPE		
6. Professional or Statutory Body of Accreditation	MQA		
7. Language(s) of Instruction	English		
8. Mode of Study (Conventional, distance learning, etc)	Research		
9. Mode of operation (Franchise, self-govern, etc)	Self-governing		
10. Study Scheme (Full Time/Part Time)	Full Time		
11. Study Duration	Minimum : 3 years Maximum : 8 years		
Type of Semester	No. of Semesters		No of Weeks/Semester
	Mi n	Ma x	
Normal	6	16	14
Short	-	-	-

Course Classification

No.	Classification	Credit Hours	Percentage
i.	University General Course (1 course)	3	
ii.	Program Core (5 courses not counted into the overall credits)	HW	
iii.	Research (Minimum 6 semesters)	0	
iv	Thesis	0	
	Total	3	

Program Educational Outcomes (PEO)

- PEO 1: Graduates are able to generate in-depth relevant knowledge in professional practices for the benefits of both national and international communities.
- PEO 2: Graduates are able to maintain conducive working environment qualities through effective leadership, complex problem solving and high order thinking skills.
- PEO 3: Graduates are able to advocate relevant knowledge and expertise through effective oral and written communications.
- PEO 4: Graduates are able to facilitate discovery to contribute towards the generation of new knowledge.
- PEO 5: Graduates are able to nurture, promote professional and ethical responsibilities including contemporary issues and environmental awareness.

Program Outcome (PO)

- PO 1: Ability to integrate and generate in-depth relevant knowledge in professional practices for the benefit of the field of engineering education.
- PO 2: Ability to formulate hypothesis, carry out research scientifically to solve and explained observed phenomena in engineering education.
- PO 3: Ability to critically analyse and evaluate situations to synthesis findings and their implications into new ideas in engineering education.
- PO 4: Ability to independently conduct engineering education research in a professional and ethical manner.
- PO 5: Ability to communicate effectively in oral and written form the findings, knowledge, recommendations and rationale to experts, peers and the community in engineering education.
- PO 6: Ability to continuously update professional knowledge and skills.

GRADUATION CHECKLIST

To graduate, students must pass all the stated courses and assessment in this checklist. It is the responsibility of the students to ensure that all courses and assessment are taken and passed. Students who do not complete any of the assessment are not allowed to graduate.

NO.	CODE	COURSE	CREDIT EARNED (JKD)	CREDIT COUNTED (JKK)	TICK (√) IF PASSED
SCHOOL OF ENGINEERING (ENGINEERING EDUCATION) COURSES					
1	Uxxx xxx3	University General Course (1 course)			
2		Program Core (5 courses not counted into the overall credits)			
	PLPT 6113	Fundamentals of Engineering Education			
	PLPT 6123	Research Methodology in Engineering Education			
	PLPT 6133	Data Analysis Techniques			
	PLPT 6140	Seminar in Engineering Education			
	PLPT 6143	Issues in Engineering Education			
3	PLPT XX00	Research (Minimum 2 semesters)			
4	PLPT xxx0	Thesis			
5		Publication (minimum one (1) refereed article or two (2) indexed conference proceedings accepted as published in SCOPUS/ERA/WOS)			

COURSE SYNOPSIS

CORE COURSES

PLPT 6113 - Fundamentals of Engineering Education

This course introduces students to the basics of engineering education which include pedagogy, learning approaches, and teaching strategies. Students are also familiarized with topics related to curriculum design, teaching materials (such as applications of ICT, software, etc.), assessment and evaluation methods, as well as enhancement of generic skills through teaching practice.

PLPT 6123 - Research Methodology in Engineering Education

This course aims to introduce the rigorous research methodology in engineering education from both the quantitative and qualitative approaches. The topics include epistemological assumptions of research, research methodology, research design, data collection techniques, sampling and instrumentation, validity and reliability, trustworthiness and introduction to data analysis.

PLPT 6133 - Data Analysis Techniques

This is the continuation of PTL6123 to guide students in analyzing data. The topics which are covered in this course draw from both quantitative and qualitative data analysis techniques such as descriptive statistics, inferential statistics, coding techniques, document analysis, thematic analysis and constant comparisons method. The inferential statistics includes some statistical tests of correlation analysis, t-test, one-, two-, three-way ANOVA, factor analysis, regression and structural equation modeling (SEM), while the coding techniques comprise of open coding, axial coding and selective coding.

PLPT 6140 - Seminar in Engineering Education

This course provides the platform for students to develop and enhance their competency and confidence as independent researchers in the area of engineering education. Students are trained to effectively present and communicate their research ideas, both in the verbal and written forms. Through this course, they are also expected to instill the awareness of the importance of becoming critically reflective and reflexive researchers throughout their intellectual journey.

PLPT 6143 - Issues in Engineering Education

This course compliments PLT 6113 in which students are introduced to the history and philosophy of engineering education. Discussions on this particular topic help to strengthen students' knowledge on their respective research areas. Such knowledge further facilitates students to identify the relevancies of their research projects within the twenty-first century engineering education scenario. Among the issues included in the discussions are active learning approaches for engineering students, effective teaching strategies for engineering educators, outcome-based approach for curriculum development, as well as its relevant assessment and evaluation methods.