ENGINEERING EDUCATION AND GENERIC PROGRAMME

MASTER OF PHILOSOPHY

FIELD OF RESEARCH:

1. **ENGINEERING EDUCATION**
   Engineering Learning Approaches, Assessment in Engineering Education, Engineering Epistemologies, Future Ready Engineering Educators and STEM Education Research.

2. **GENERIC**
   Generic is the term use to describe any field of research under broad Engineering and engineering trades without specializing in any of the detailed fields. The generic programme covers a wide range of research fields. Also, the generic research study could comprise works of various disciplines within the engineering schools.

PROGRAMME SPECIFICATIONS

The Master of Philosophy (MLPG) is offered on a full-time basis. The duration of study is in between minimum of one (1) year to a maximum of four (4) years.

The aim of the programme is to produce postgraduates in Doctor of Philosophy in line with the inspirations of UTM which are innovative, entrepreneurial, and global in the area related to engineering, technology, and management of technology. In order to satisfy this aim, PEO has been formulated based on the visions and missions of UTM and SPS.

Generic programme has collaboration with research centre in UTM as list below:

i. Center of Engineering Education (CEE), UTM
ii. Advanced Membrane Technology Research Centre (AMTEC), UTM

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

General Information

<table>
<tr><td colspan="2">1. Awarding Institution</td><td colspan="2">Universiti Teknologi Malaysia</td></tr>
<tr><td colspan="2">2. Teaching Institution</td><td colspan="2">Universiti Teknologi Malaysia</td></tr>
<tr><td colspan="2">3. Programme Name</td><td colspan="2">Master of Philosophy
Field of Research:
- Engineering Education
- Engineering and Engineering Trades (Broad Programmes)</td></tr>
<tr><td colspan="2">4. Final Award</td><td colspan="2">Master of Philosophy</td></tr>
<tr><td colspan="2">5. Programme Code</td><td colspan="2">MLPG (Starting from 2014)
MLG (Before 2014)</td></tr>
<tr><td colspan="2">6. Professional or Statutory Body of Accreditation</td><td colspan="2">MQA/SWA0810</td></tr>
<tr><td colspan="2">7. Language(s) of Instruction</td><td colspan="2">English</td></tr>
<tr><td colspan="2">8. Mode of Study (Conventional, distance learning, etc)</td><td colspan="2">Research</td></tr>
<tr><td colspan="2">9. Mode of operation (Franchise, self-govern, etc)</td><td colspan="2">Self-governing</td></tr>
<tr><td colspan="2">10. Study Scheme (Full Time/Part Time)</td><td colspan="2">Full Time</td></tr>
<tr><td colspan="2">11. Study Duration</td><td colspan="2">Minimum : 1 year
Maximum : 4 years</td></tr>
<tr><td rowspan="2">Type of Semester</td><td colspan="2">No. of Semesters</td><td>No of Weeks/Semester</td></tr>
<tr><td>Min</td><td>Max</td><td></td></tr>
<tr><td>Normal</td><td>2</td><td>8</td><td>14</td></tr>
<tr><td>Short</td><td colspan="2">-</td><td>-</td></tr>
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Course Classification

No.	Classification	Credit Hours	Percentage
i.	University Elective (1 course)	3	
ii.	Research Methodology	HW	
iii.	Research (Minimum 2 semesters)	0	
iv	Thesis	0	
	Total	**3**	

Engineering Education

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.

Engineering and Engineering Trades (Broad Programmes)

Programme Educational Objectives (PEO)

With the spirit of outcome based education, our programme educational objectives are to produce graduates with the following abilities five years after their graduation:

PEO 1: Generate in-depth, relevant and cutting-edge knowledge through original, ethical and scholarly research.

PEO 2: Utilized the research knowledge for the benefit of communities, society, nation and humanities.

PEO 3: Advocate relevant knowledge and expertise through effective oral and written communications.

PEO 4: Pursue lifelong learning, such as graduate work and other professional education.

PEO 5: Become effective collaborators and innovators, leading or participating in efforts to address social, technical and business challenges.

Programme Learning Outcomes (PLO)

The Programme Learning Outcomes (PLOs) are attributes that are expected to be attained by students upon completion of their postgraduate degree in Doctor of Philosophy programme. Our programme Learning Outcomes are described as follows:

PLO 1: Show a systematic comprehension and in depth understanding of a discipline and mastery of skills and research methods related to the field of study.

PLO 2: Show capabilities to generate, design, implement and adopt the integral part of research process with scholarly strength and ethics.

PLO 3: Contribute to the original research by making critical analysis, evaluation and synthesis of new and complex ideas that broadened the boundary of knowledge.

PLO 4: Practice research ethics and conduct responsible research.

PLO 5: Communicate with peers, scholarly community and society at large concerning the field of expertise.

PLO 6: Promote technological, social and cultural progress in a knowledge-based society in the academic and professional context

PLO 7: Demonstrate sensitivity to social needs and readiness to apply relevant knowledge to fulfilling them

PLO 8: Demonstrate the awareness of effective team-working conducting research

PLO 9: Demonstrate leadership capability and the ability to effectively deliver knowledge, scientific findings, recommendations and rationale to peers and experts.

PLO 10: Ability to gather, organize, adapt contemporary knowledge effectively and capable of utilizing appropriate computational tools independently.

PLO 11: Demonstrate the ability of managing and conducting research or other activities, and display the awareness of the need to exploit all possible resources and opportunities which include personal, institutional or business linkages and collaboration

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
FACULTY OF ENGINEERING (ENGINEERING EDUCATION) COURSES					
1	Uxxx xxx3	University General Course (choose 1 course) UHAP6013 (Seminar on Global Development, Economic and Social Issues) – Faculty of Management (FM) UICW6023 (Philosophy of Science and Civilization) – Faculty of Islamic Civilization (FTI) UCSM1263 (IT Project Management) – Faculty of Computing (FC) UPPF6033 (Dynamics of Leadership) – Faculty of Education (FP)			
1	UXXX XXX3	University Elective (1 course)			
2	UKKP 0010	Research Methodology **For Engineering Education*			
	UKKP0010	School of Chemical and Energy Engineering			
	UKMP0010	School of Mechanical Engineering			
	UMBP0010	School of Biomedical Engineering and Health Sciences			
	UKEP0010	School of Electrical Engineering			
	UAPA0010	School of Civil Engineering			
3	MLPG XX00	Research (Minimum 2 semesters)			
4		Thesis			
5		Publication (minimum one (1) publication from journal article or conference proceeding or book chapter)			

COURSE SYNOPSIS

Research Methodology

In this course, students were taught how to conduct research. Start from how to get problem statement, find objectives and scope, conduct literature review, experiment, survey, and analysis, and finally make conclusions. A few tricks and tips on writing thesis and viva also explained.

Besides those two courses, all doctoral/master full research programmes require students to complete a doctoral/master thesis.

There is no course offered in the programme, however students can join other courses conducted by any faculty.