



POSTGRADUATE

# HAND BOOK

Master Research Programmes

The Master of Science candidate is supervised by an academic staff (or a panel of supervisors) from the faculty. The directed research work will focus on a particular subject that introduces candidates to the processes by which new knowledge is developed or/and applied accordingly. The specific topic of investigation will be agreed upon by the supervisor (or panel of supervisors) and the candidate. The academic progress of a candidate is assessed through a research. Progress Report submitted at the end of each semester. The degree is awarded based on an oral examination (viva-voce) of the thesis submitted by the candidate on completion of the study. Candidates intending to study by research may submit their application for admission throughout the year.

Faculty of Electrical Engineering offers two programme for Master of Science:



Master of Science in Electrical Engineering  
(MEKA)

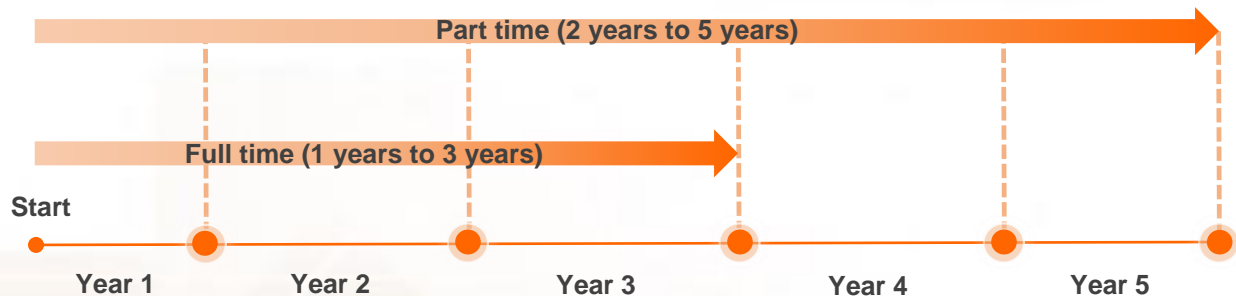


Master of Science in Mechatronics Engineering  
(MEKM)



#### DURATION OF STUDIES

Candidates intending to study by research may submit their application for admission throughout the year.





## ENTRY REQUIREMENTS

### Academics Requirement:

- a) A Bachelor degree from any institution of higher learning recognized by the UTeM Senate; or
- b) Other equivalent Bachelor degrees and relevant experience recognized by the UTeM Senate.

### Language Requirement:

- a) International applicants are required to present the Test of English as a Foreign Language (TOEFL) or the test administered by the International English Language Testing System (IELTS) with the minimum required score listed in Table 1:

Table 1: Minimum English Requirement

Minimum TOEFL score	Minimum IELTS score
550	6.0

- b) Applicants without TOEFL/IELTS or for those who obtained a score below the requirement above are required to undergo and pass the English language programme conducted by UTeM prior to commencement of the postgraduate programme.
- c) Exemption may be given to those who have undertaken regular programmes of studies and graduated from universities that use English as the medium of instruction or who has graduated from UTeM in a programme with English as the medium of instruction.

### Additional Requirements for International Students:

- a) All international students are required to register as full time student and should have the financial capability to meet the course fees and living expenses.
- b) Applicants need to submit a letter of certification from their Ministry of Education verifying nationality and academic qualifications of candidate.
- c) Academic transcripts and supporting documents must be certified true copies by a senior public official from the applicant's country or from Malaysia.
- d) Proof of financial ability to pursue their studies and live in Malaysia for the duration of study. A letter of financial guarantee/sponsorship or the most recent financial statement from applicant's bank is sufficient.

- e) Have international passport with at least TWO (2) years validity and meet all immigration procedures and Medical check-up by the health authorities.

## Programme Outcomes (PO) – Master Programme

Programme Outcome (PO) are statements describing what students are expected to know and be able to perform or attain by the time of graduation. These are related to the Knowledge (K), Skills (S), and Attitude (A) that students acquire throughout the programme.

Below is the list of Programme Outcomes for Faculty of Electrical Engineering's Master's Programme:



Demonstrate mastery of knowledge in electronic engineering.



Apply advanced skills acquired in practical electronic engineering situation.



Relate ideas to societal issues in electronic engineering.



Conduct project and adhere to legal, ethical and professional codes of practice.



Demonstrate leadership qualities through communicating and working effectively with peers and stakeholders.



Generate solutions to problems using scientific and critical thinking skills.



Manage information and lifelong learning skills.

## Master of Science in Electrical Engineering – MEKA

Electrical engineering forms the fundamental study to the generation, distribution and utilisation of energy efficiently. There will be significant growth in research, development and manufacturing activities in the field of electrical engineering and it constitutes the basis for valuable and worthwhile careers for well-qualified graduates.



### Programme Educational Objectives (PEO) – MEKA

Programme Educational Objective (PEO) are specific goals describing the expected achievement of graduates in their career and professional life after 5 years of graduation. Below are the PEO for the Faculty of Electrical Engineering's PhD Programme:



Master knowledge acquired for innovation and creative scholarly activities in electrical engineering



Practice professional leadership in related to electrical engineering field



Engage with community and industry towards sustainable development and life-long learning

## Master of Science in Mechatronics Engineering - MEKM

The Faculty offers a wide range of laboratories, fully equipped with the latest teaching and learning equipment with the ratio of TWO (2) to THREE (3) students per station. This arrangement will suit the teaching and learning concepts based on problem centered, action learning and practical application as stipulated in the Practice and Application Oriented approach.



### Programme Educational Objectives (PEO) – MEKM

Programme Educational Objective (PEO) are specific goals describing the expected achievement of graduates in their career and professional life after 5 years of graduation. Below are the PEO for the Faculty of Electrical Engineering's DEng Programme:



Master knowledge acquired for innovation and creative scholarly activities in mechatronics engineering




Practice professional leadership in related to mechatronic engineering field



Engage with community and industry towards sustainable development and life-long learning





# ***Course Implementation***

**Master Research Programmes**



## Programme Structure

The Programme for both MEKA and MEKM are as follows:

Course		Credit Hours
Compulsory course	Research Methodology	3
Elective course (Choose one)	Entrepreneurship	3
	Engineering & Technology Management	3
	Project Management	3
	Quality Systems Management	3
Thesis		84
Total Credit Hours		90





## Subject Details

### **MPSW 6013 RESEARCH METHODOLOGY**

The course is designed to introduce students to the principles and good practices of Research and Development (R & D). Activities at each step of the research process will be elaborated in order to develop the skills and competencies required to facilitate a successful research programme at postgraduate level. At the end of the course, students are expected to submit a research proposal on the topic of their interest.

#### References:

- [1] Barbie, Earl R., 1998, Survey Research Methods, 2nd Edition, Waddsworth Publishing Company, California, USA, 1998.
- [2] Linda Cooley and Jo Lewkowicz, 2003, Dissertation writing In Practice, Turning Ideas Into Text, 1st Edition, Hong Kong University Press.
- [3] James, E.M., Jack, W.B., 2005, Guide To the Successful Thesis and Dissertation. 5 th Edition, Marcel Dekker, Inc., New York, USA.
- [4] Syed, V.A., and Victor, B.L., 2005, The Art of Scientific Innovation, Cases of Classical Creativity, 1st Edition, Pearson Prentice hall, New Jersey, USA.
- [5] Blaxter, L. et al., 2001, How to Research, 1st Edition, Open University Press, Milton Keynes, Buckingham, UK

### **MPSW 6063 ENTREPRENEURSHIP**

This course is designed for ambitious new competences, engineers and scientists in creating acquiring and existing business, or working in industries serving the entrepreneurs, or postgrads interested in acquiring and developing their talent as well as familiarising with the concepts, issues, and techniques of new venture creation. It addresses challenging issues on high technology venturing, intellectual property and intellectual property development, the installation of innovative organisation, the effective control of the innovation, and the management of the supply chain. A

key element of the Entrepreneurship programme is the development of business plan by individual, and case study analysis aiming to create new ventures. Topics include development of successful ideas, developing a profitable business models, writing a business plan, market opportunities for high-tech products enabled by technology, technology and innovation, intellectual property rights, inventions inventors and invention ownership, strategic control for new ventures and venture legal aspects.

#### References:

- [1] Bruce R. Barringer & R. Duanne Ireland. (2006). Entrepreneurship: The Successful Launch of New Ventures, (1st Edition). Prentice Hall
- [2] Bygrave & Zacharakis (2008), Entrepreneurship, John Wiley & Son
- [3] Mary Coulter. (2003). Entrepreneurship in Action (2nd Edition) Prentice Hall.
- [4] Kuratko & Hodgetts (2004), Entrepreneurship (3rd Edition), Dryden Press.
- [5] Lupiyoadi (2007), Entrepreneurship: from Mindset to Strategy (3rd Edition), Lembaga Penerbitan Fakultas Ekonomi Universitas Indonesia.

### **MPSW 6033 ENGINEERING AND TECHNOLOGY MANAGEMENT**

The subject consists of two components, i.e., Engineering Management and Technology Management. Topics in Engineering Management provide a vehicle for engineers and technical specialist to enhance their knowledge on management, organizational structure and behavior of engineering/technical organizations. Additional topics will enhance the knowledge and competencies in the management of engineering activities such as design, operations, and quality. The Technology Management part of the subject will equip students with contemporary views and tools on management of technology and its impact on an organization. It emphasizes management of innovation and new product development as well as managing technology and knowledge. The interaction of

technology and the law, particularly the knowledge management and intellectual property will be covered.

References:

- [1] Lucy C. Morse and Daniel L. Babcock (2010) Managing Engineering and Technology, Pearson.
- [2] Trott, P. (2005), Innovation Management and New Product Development, Prentice Hall.
- [3] Naushad Forbes, David Wield (2002) From Followers to Leaders – Managing Technology and Innovation, Routledge.
- [4] Edosomwan, J (1995), Integrating Productivity and Quality Management, 2nd Edition, Routledge.
- [5] Patrick D. T. O'Connor, (2008), The new management of engineering, Lulu Publications

#### **MPSW 6073 PROJECT MANAGEMENT**

This subject focuses on the principles of project management including the importance and interrelationship of all its components. Students will be familiarized with the Project Management process group functions (initiating, planning, executing, controlling and closing) and project knowledge areas (integration, scope, time, cost, quality, human resources, communications, risks and procurement). Various tools for supporting the analysis of works in engineering project management will be introduced. Topics including initiating and planning the project, working with the management, project appraisal & sensitivity, creating budget and work breakdown structure, managing uncertainty & risk, building project plan, implementing and revising project plan, completing the project and contract laws

References:

- [1] Meredith, Mantel, Shafer and Sutton (2001). Core Concepts: Project Management in practice, John Wiley & Sons.
- [2] Rosenau, M.(2005). Successful Project Management, 3 Ed.. John Wiley & Sons.

- [3] Pinto, K. Jeffrey. (2007). Project Management, Achieving Competitive Advantage. Pennsylvania State University, Prentice Hall.
- [4] Gray, C.F and Larson, E.W, (2006). Project Management; A Managerial Perspective. McGrawHill
- [5] Meredith, J., Mantel, S. and Mantel, S. Jr. (2005). Project Management: A Managerial Approach. New York, John Wiley & Sons Inc.

#### **MPSW 6053 QUALITY MANAGEMENT SYSTEM**

This course presents the fundamental elements of Quality Management System including the importance of quality as a strategy for continuous improvement in business performance. It explains the strategies for competitive quality in design and manufacture as well as in terms of customer supply chain concept of total quality aspect. Such topics include Management systems ISO, variability, Six Sigma, Taguchi method, failure mode and effect analysis (FMEA) and quality function deployment. Several quality control tools such as Pareto chart, bar chart and scatter diagram will be cover in statistical data collection, measurement and analysis. Finally, concepts of benchmarking and ISO standards with respect to control elements will be integrated with the Total Quality Management (TQM) as part of quality Management system.

References:

- [1] Gitlow, H. S., Quality Management systems: A Practical Guide, St. Lucie Press, 2001.
- [2] Mukherjee, P. N., Total Quality Management, Prentice Hall, 2006.
- [3] Oakland, J. S., TQM with Cases, 3rd Ed., Butterworth-Heinemann, 2003.
- [4] Kolarik, Creating Quality Concepts, Systems, Strategies & Tools, McGraw Hill, 1995.
- [5] Bergman and Klefsjo, Quality from Customer Needs to Customer Satisfaction, McGraw Hill, 1994.

