

ADMISSION REQUIREMENTS

1. Bachelor Degree or equivalent in the field of engineering or engineering technology with minimum CGPA of 2.750; or
2. Bachelor Degree or equivalent in the field of engineering or engineering technology with CGPA of 2.500 - 2.749 and at least 3 years of working experience in the relevant field; or
3. Bachelor Degree or equivalent in the field of engineering or engineering technology with CGPA of 2.250 - 2.499 and at least 5 years of working experience in the relevant field; or
4. Bachelor Degree or equivalent in the field of science or technology with minimum CGPA of 3.000; or
5. Bachelor Degree or equivalent in the field of science or technology with CGPA of 2.750 - 2.999 and at least 3 years of working experience in the relevant field; or
6. Bachelor Degree or equivalent in the field of science or technology with CGPA of 2.500 - 2.749 and at least 5 years of working experience in the relevant field.

Note: Admission candidates with a Bachelor Degree in science or technology or its equivalent must sit the prescribed engineering-related prerequisite course for this programme.

International candidates are required to meet the following English Language requirements:

1. 550 for TOEFL Paper-based Test (Academic Version); or
2. Band 6.0 for IELTS (Academic Training); or
3. 80 for TOEFL Internet-based Test (Academic Version)

FEES

Fees	Master without thesis	
	Local Student	International Student
Basic Fees (1st semester)	RM 1,425	RM 2,475
Basic Fees (2 and subsequent semester)	RM 1,175	RM 2,225
Credit Fees *Subject to change	Rm 370/ credit	RM 450/ credit



APPLICATION

Please apply online via:

<http://sgsportal.upm.edu.my:8080/sgsportal>
www.sgs.upm.edu.my/prospective_students-2964

For further information, please contact :

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PROGRAMME COORDINATOR

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MASTER IN CONTROL SYSTEM ENGINEERING

Department of Electrical and Electronics
 Faculty of Engineering, Universiti Putra Malaysia

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INTRODUCTION

This programme is designed for research students, industrial practitioners and enthusiasts to deepen their theoretical and practical understanding in the field of control systems. The courses within this programme focuses on intelligent technology in parallel with knowledge and skills closely related to Industry 4.0 which refers to five of the nine main pillars which are Robotics, Internet of Things, Simulation, System Integration and Artificial Intelligence. Graduates from this programme are expected to be equipped with the tools and knowledge required in control systems and to be a competitive graduate with the latest industry needs including Industry 4.0 and Digitalization.



PROGRAM REQUIREMENTS

Credit Requirements for Graduation

Students enrolling under this programme must fulfill 40 credits of courses to graduate. The duration of the study is minimum 3 semesters (one year).

The credit distributions for compulsory courses, elective courses and project are as follows:

- Compulsory courses 24 credits
- Electives Courses 6 credits
- Dissertation 10 credits

Distribution of Courses According to the Semester

Semester 1	
EEE5100 Research Methodology	3 credits
EEE5400 Project Management in Control System	3 credits
EEE5404 Data Modelling and Simulation	3 credits
EEE5433 Control System Design	3 credits
EEE5434 Intelligent Control System	3 credits
Semester 2	
EEE5405 Non-linear Control Systems	3 credits
EEE5435 Embedded Control System	3 credits
EEE5436 Industrial Process Control	3 credits
EEE5XXX Elective I	3 credits
EEE5990 Dissertation	4 credits
Semester 3	
EEE5990 Dissertation	6 credits
EEE5XXX Elective II	3 credits

PREREQUISITE COURSE

Candidates with a Bachelor Degree in Science or Technology or equivalent must sit the engineering related pre-requisite course EEE3881 (Control Systems) before the first semester of study begins. Students register for this course as an audit. The grade that will be given is Satisfied or Not Satisfied (with a score of at least 65%) and will not be counted in the CGPA.

COURSE SYNOPSIS

PREREQUISITE COURSE

EEE3881 Control Systems
This course covers system modelling and analysis in time and frequency domains. Control system design is also introduced

COMPULSORY COURSES

EEE5100 Research Methodology
This course covers the best practices of research designs. Emphasis are given on the methods of organizing relevant information, determining appropriate research methodology, producing research proposal, academic writing, and ethical considerations in engineering research

EEE5400 Project Management in Control System
This course covers an understanding of project management principles in the control systems industry. Emphasis is placed on planning and implementing effective projects. Ethics and intellectual property management are also emphasized

EEE5404 Data Modelling and Simulation
This course will teach students how to create mathematical models that represent the behavior of system variables and compute process models that can be applied to design, analysis, prediction, optimization, and model verification. Students will learn to work with real data set and develop process models using various techniques

EEE5405 Non-linear Control Systems
This course covers the fundamentals of nonlinear systems together with stability analysis methods. Case studies and actual system are used to enhance students' understanding

EEE5433 Control System Design
This course covers dynamic process and design of control systems in time and frequency domains. Design in state-space and state-observer are also introduced. The same goes to computer aided analysis and design

EEE5434 Intelligent Control System
This course covers adaptive and intelligent control systems as well as various intelligent control system algorithms. Comparison between modern and classical control is outlined. Soft-computing techniques that mimic biological systems and human reasoning are introduced

EEE5435 Embedded Control System
This course covers programming, software and hardware for embedded system. Topics discussed cover real time system concept and design, and embedded system design issues including internet of things

EEE5436 Industrial Process Control
This course covers control system including controller design and measurement techniques used in industrial process. Practical applications of control system are emphasised in assignments

EEE5990 Dissertation
This course involves research or study by students on a specific topic. It is carried out in two semesters and covers literature review, methodology, data collection and analysis. The scope of research or study will be determined by the student in consultation with the supervisor. At the end of the first semester, the student needs to submit a preliminary report and at the end of the second semester, the student needs to submit a final report. Students are also required to present the findings of the research or study to a panel of assessors

ELECTIVES COURSES

EEE5401 Fuzzy Logic Modelling and Control
This course discusses basic ideas of fuzzy sets and fuzzy logic concepts and uses these for fuzzy rule-based control systems design. Additional application areas such as decision making, pattern recognition and fuzzy modeling are also discussed. Lectures are enhanced using computer aided tools

EEE5402 Robust and Optimal Control
This course focuses on analysis and design of robust and optimal control systems. It covers performance specifications and limitations, model uncertainty, linear fractional transformation, structured singular value, stabilization, dynamic programming, Kalman filter, and LQG, H2 and H ∞ optimal control and loop shaping. Lectures are enhanced using computer simulation

EEE5403 Pattern Recognition
This course focuses on the latest methods in pattern recognition. In particular, it outlines the need for pattern recognition, its different algorithms and decision-theoretic including learning algorithms. The course will emphasize practical techniques and provide a base for practice and progress in matters related to research

EEE5406 Applied Deep Learning
This course covers introduction to artificial neural networks and deep learning. Emphasis is on theory and practice, models for various applications, training and testing, and their usage in real world applications including control systems

EEE5407 Robotics and Control
This course focuses on robotics technology and the different components involved in the robotics design and construction. Various algorithms and control designs will be discussed to enable the robot controller parameters to be optimised

EEE5955 Model Predictive Control
This course covers the concept of model predictive control which covers various formulations and solution. Discussion on stability, tuning, robust model predictive control and nonlinear model predictive control will also be presented