



How to Apply

Information on the procedures, regulations and application form can be obtained from the Student Recruitment & Admission Division (SRAD)

www.sps.utm.my/sps/admission.html

Tuition Fees

Student Category	Fees for Per Semester by Programme			
	Master (Taught Course) Local students		Master (Taught Course) International students	
	Full Time (RM)	Part Time (RM)	Full Time (RM)	Part Time (RM)
New Student (First Semester)	3,485.00	2,485.00	7,810.00	5,310.00
Continuing Student	2,935.00	1,935.00	7,260.00	4,760.00
Continuing Student (Semester III)	2,935.00	1,935.00	7,260.00	4,760.00
Continuing Student (Semester IV & beyond)	** (Any extra sem)	1,935.00	** (Any extra sem)	4,760.00
Total Tuition Fees (Normal Duration)	9,355.00	8,290.00	22,330.00	19,590.00

****Any extra semester will be charged according to University charges.**

Fees for an international applicant (is not include Personal Bond; VISA, Medical Check-up & Accommodation).

Facilities & Labs

- Automotive Laboratory, incorporating Automotive Development Center
- Gas Turbine and Combustion Laboratory
- Low Carbon Laboratory
- Drivetrain Test Rig
- Computational Solid Mechanics Laboratory
- Centre for Composites
- Software to support courses (Solidwork, Fluent, Abaqus, Matlab etc).



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UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Faculty of
Mechanical Engineering

Master of Science

Automotive Engineering



innovative • entrepreneurial • global

Programme Objective

The aim of MSc. (Automotive Engineering) programme is to enhance students with related knowledge and skills in Automotive Engineering. After completion of the programme, graduates can apply the knowledge and skills to design, implement and problem solving and deliver knowledge, ideas effectively to society in the area of automotive engineering.

Programme Duration

For a full-time student, the completion of a master programme typically requires three semesters (1½ years). However, the programme may be completed in a minimum time of 1 year (2 normal and 1 short semesters). The maximum duration allowed for full-time students is 6 normal semesters (or 3 years) while part-time students are given a maximum of 8 normal semesters. The full time student is allowed to take a maximum of 20 credits in a normal semester and 10 credits in a short semester. The part time student is allowed to take a maximum of 12 credits in a normal semester and 6 credits in a short semester.

Admission Requirement

The normal requirement for admission to the programme is a four-year bachelor degree recognized by the university in either engineering or sciences with a minimum overall grade point average of 3.0 or equivalent. Students applying for admission with an overall grade point average of less than 3.0 but with relevant professional experiences may however be considered.

Graduation Requirement

Students must obtain a minimum grade of B- (60%) for each course and overall average grade of B (65%) to graduate. Students are also required to complete a minimum of 40 credits (15 credits of the core automotive engineering courses; 12 credits of the elective mechanical engineering courses; 10 credits of the master project and 3 credits of the university compulsory course). For the award of Master of Science (Automotive Engineering), the students should achieve a total minimum of 40 credit hours with minimum CPA of 3.0, including the completion of Master Project.

Programme Description

Automotive Engineering programme offers a broad and diverse subject that derives its breadth from the need to analyse and design various automotive-related systems. Throughout the period of study, students may learn about vehicle engineering, vehicle dynamics, automotive powertrain, automotive NVH, automotive aerodynamics, automotive tribology, braking system, electronics & control, just to name a few.

Programme Structure :

Course	Credit
University Core (1 course only) UHAP 6013 Development & Global Issues UHAW 6023 Science Philosophy & Social Development (or other courses UXXX xxx3)	3
Automotive Engineering Core MKMM 1213 Advanced Engineering Mathematics MKMV 1203 Automotive Electronics & Control MKMV 1803 Quality Engineering MKMV 2213 Automotive Noise, Vibration and Harshness MKMM 1903 Research Methodology	15
Electives (12 credits only) MKMV 1213 Vehicle Engineering MKMV 1313 Advanced Vehicle Dynamics MKMV 2223 Automotive Braking System MKMV 2323 Automotive Aerodynamics MKMV 1403 Internal Combustion Engines MKMV 1503 Drivetrain Engineering MKMV 2413 Advanced Engine Boosting And Downsizing MKMV 2513 Automotive Tribology MKMV xxxx Special Topics	12
Free Elective Students are allowed to take a graduate-level course (3 credits) from any other engineering faculty throughout the study duration	
Master Projects MKMV 1914 Master Project 1 MKMV 2926 Master Project 2	10
Total Credits	40

*Elective courses are offered based on availability of academic staff and facilities

List of Academic Staff

Kamarul Baharin Tawi

Assoc. Professor/Head of Department
PhD (Mechanical Eng.) Cranfield, UK
MSc (CAD for Manufacture), Aston, UK
BEng (Mechanical Eng.) UWIST, UK
Area of Expertise: CVT, Automotive Drivetrain

Pakharuddin Mohd Samin

Assoc. Professor
PhD (Mechanical Eng.), UTM
MSc. (Mechanical Eng.) Texas, A&M
BSc (Mechanical Eng.) Texas, A&M
Area of Expertise: Vehicle dynamics & control

Srithar a/l Rajoo

Assoc. Professor
PhD (Mechanical), Imperial College London
MEng (Eng. Mngt.), UTM
BEng (Mech.-Material), UTM
Area of Expertise: Engine Air Management System, Energy/Waste Heat Recovery, Turbo Machinery & Aeroacoustics

Saiful Anuar Abu Bakar

Senior Lecturer
PhD (Mechanical), UTM
PhD (Interdisciplinary Eng.), Tokai Univ. Japan
MEng (Mech), UTM
BEng (Mech-Automotive), UTM
Area of Expertise: Vehicle Dynamics & Control, Electric & Hybrid Vehicle, Computer Vision

Zul Hilmi Che Daud

Senior Lecturer
PhD (Mechanical Eng.), ISAT
MSc (Auto Eng.), ISAT
BEng (Mech.-Auto), UTM
Area of Expertise: Vehicle Powertrain, Electric & Hybrid Vehicle

William Chong Woei Fong

Senior Lecturer
PhD (Mechanical Eng), Cranfield
MSc (Automotive Product Eng.), Cranfield
BEng (Mechanical), UTM
Area of Expertise: Tribology and Surface Engineering

Nur Izwanne Mahyon

Lecturer
MSc (Safety, Health & Environment), UTM
BEng (Chemical Eng), UTM
Area of Expertise: Exhaust Emission Treatment, Biofuel, Ceramic and Polymeric Membranes

Nurulakmar Abu Husain

Senior Lecturer/Program Coordinator
PhD (Mechanical Eng.), Liverpool
MSc (Automotive Eng.), Bath
BEng (Mech. - Auto), UTM
Area of Expertise: Structural Dynamics, FE Modelling & Modal Updating

Abd Rahim Abu Bakar

Senior Lecturer
PhD (Mechanical Eng.), Liverpool
MSc (Automotive Eng.), Leeds
BEng (Mechanical), UTM
Area of Expertise: Structural Dynamics, Brake Design & Safety

Mohd Kameil Abdul Hamid

Senior Lecturer
PhD (Automotive Tribology), Univ. of Western Australia
MSc (Eng), Leeds
BSc (Mechanical Eng.), SUNNY
Area of Expertise: Automotive Tribology

Mohd Farid Muhamad Said

Senior Lecturer
PhD (Mechanical), Univ. of Leicester UK
MEng (Mechanical), UTM
BEng (Mechanical) (UTM)
Area of Expertise: ICE, Biofuel, Multiphase Flow

Course Description

CORE COURSES

MKMM 1213 – Advanced Engineering Mathematics

The primary goal of this course is to get students involve very much in the post-calculus mathematics needed and used by engineers and scientists. The mechanical engineering field depends on mathematics for their description with development of new mathematics from new mechanical engineering problems. Thus, this course aims to place at the disposal of the engineer the basis of intelligent working knowledge of facts and techniques relevant to engineering applications which have not been treated in Advanced Calculus.

MKMM 1203 – Automotive Electronics and Control

This course focuses on vehicle electronic that incorporates principle study of sensors and actuators used in automotive control applications. The major topics cover the variety and role of electronic sensors and actuators, sensor's signal conditioning systems, actuator's drivers and control systems in automotive applications. At the end of this course, students are able to design and develop electronic and control system in vehicles.

MKMM 1803 – Quality Engineering

This course is focussing on statistical methods in quality improvement. It encompasses various statistical process control problem-solving tools. Emphasis is given on analysis of additional control charts. Advanced tools and techniques such as Gauge Reliability and Reproducibility (GR & R), and experimental design methodology are also covered. At the end, students are able to formulate quality assurance methodology for automotive application.

MKMM 2213 – Automotive Noise, Vibration and Harshness

This course is focusing on the principle of vehicle vibration and acoustics. The discussion includes the effects of vibration and acoustic on vehicle systems or components, popular approaches for reducing the vibration and harshness, acoustic, human perception to noise, vibration and guidelines and assessment method. Finally, the discussions conclude with the application of popular computational methods for automotive NVH applications. At the end of the course, students are able to categorized NVH of passenger vehicles.

ELECTIVE COURSES

MKMV 1213 – Vehicle Engineering

This course focuses on the principles of vehicle engineering. The course stresses on the principal functions of the body structure, chassis system, power-train system, climate control system and electrical & electronic systems. Additionally, the discussion includes the vehicle design to meet the acceleration, braking, cornering, ride, rollover, road loads, durability, safety and vibration requirements.

MKMV 1313 – Advanced Vehicle Dynamics

This course discusses vehicle dynamics in general which covers acceleration/braking performance, road loads, vehicle ride & handling characteristics, steady-state/transient stability and control, modelling & simulation of passive and active suspension using engineering software tools. Focus of the course is to develop equation of motions of vehicle dynamics model and to analyze its performance in terms of ride, comfort, braking/acceleration & handling behaviour which incorporated with control system. At the end of the course, the students are able to design new advanced suspension system.

MKMV 2223 – Automotive Braking System

This course focuses on the principles of brake systems such as disc and drum brakes. The discussion includes analyzing deceleration behaviour of a road vehicle and braking performance including thermal characteristics, main features of Anti-lock Brake System and finally the noise and vibration issues of the brake systems.

MKMV 2323 – Automotive Aerodynamics

This course is focussing on the principles of ground vehicle aerodynamics such as passenger and racing cars. The course emphasizes on analyzing aerodynamic behaviour of a road vehicle on the influence of aerodynamics on economy, performance and roadholding, including internal flow and noise characteristics. The discussion will include the effect of crosswind, the use of wind tunnel, computational fluid dynamics (CFD) and road testing.

MKMV 1403 – Internal Combustion Engines

This course focuses on advanced knowledge of internal combustion engine. The discussion on principle operating and engineering characteristics of internal combustion engine (ICE) used in the automotive industry. This discussion includes engineering analyses knowledge on engine cycles and thermo chemistry applied to engine operation and engine fuels. This also includes advanced engine design and heat transfer. At the end, student must be able to design a highly efficient internal combustion engine.

MKMV 2513 – Automotive Tribology

Tribology is focusing on the friction, wear and lubrication principle and application. The course is originated from the art of lubrication but has developed many different types and range of applications. Among the topics discussed are principle of lubrication and surface topography characterization. In automotive application, almost half of the mechanical power generated by the engine is wasted in friction between pistons and cylinders and within the gearbox and transmission gears. At the end of this course, students are able to predict the most suitable tribological surfaces characteristic for best tribological performance.

MKMV 2413 – Advanced Engine Boosting and Downsizing

This course is designed to deliver the principles of engine boosting and its significant role towards engine downsizing. The course emphasizes on the engine air induction system, in particular the turbocharging and supercharging systems. It covers the science governing the operation of turbochargers and superchargers – which include aerodynamics, gas dynamics and thermodynamics. Upon completion of this course, students are able to design a supercharger/turbocharger and match it with an engine.

MKMV 1503 – Drivetrain Engineering

This course covers principle knowledge of automotive drivetrain/transmission. It includes mechanical components and sub-systems which consider the mechanics of the components, the force flow, its free body diagram and its working principle. At the end of the course, students are able to design transmission system for passenger vehicles.