

## RESEARCH GROUPS

- Advanced Packaging & Surface Mount Technology
- Bio-mechanics
- Biomass Energy and Energy Efficient System
- Stress, Damage and Failure Mechanisms
- Industrial & Manufacturing
- Industrial Engineering and Operation Management
- Nanofabrication and Functional Material
- Metal Forming Research Lab
- The Vibration Lab



## 03 RESEARCH GROUPS

## 04 MORE INFO

### ADMISSION REQUIREMENTS

Applicants should have the following minimum requirements:

**For M.Sc.:** A Bachelor's degree with honors in Mechanical Engineering/Manufacturing Engineering or equivalent (CGPA >2.75).

**For Ph.D.:** A Master's or Bachelor's (First-Class Honors or CGPA >3.67) degree in related areas.

Minimum language requirement (for foreign students): IELTS Band 6, TOEFL Score 550 or MUET Band 3

### DURATION

#### MSC.

Full-time : Min. 12 months / Max. 36 months  
Part-time : Min 24 months / Max. 72 months

#### PhD.

Full-time : Min 24 months / Max. 60 months  
Part-time : Min 36 months / Max. 90 months

### APPLICATIONS FORMS & FINANCIAL SUPPORT

Please look up the website of *Institute of Postgraduate Studies, USM* (<http://www.ips.usm.my>) for applications forms, financial support and other information.

**Deputy Dean**  
Research, Innovation &  
Community-Industry Engagement  
School Of Mechanical Engineering  
Universiti Sains Malaysia

+604-599 6304

[mechanical@usm.my](mailto:mechanical@usm.my)

[mechanical.eng.usm.my](http://mechanical.eng.usm.my)

# POSTGRADUATE STUDY & RESEARCH

► School of Mechanical Engineering  
Universiti Sains Malaysia



# ABOUT THE SCHOOL

The School of Mechanical Engineering (SoME) was established in 1989. The main objective for the establishment of the school is to produce graduates in the field of mechanical engineering and manufacturing engineering to fulfill the requirement for specialized knowledge workers by most industries in Malaysia, especially industries involving activities such as design and development, manufacturing and production, maintenance of mechanical, mechatronics systems, devices, equipment, component, machines and support system and infra-structure development.

The other objective is to acquire and disseminate knowledge in the field pertaining to mechanical and manufacturing engineering through research activities, development, project works and professional networking. The dissemination of knowledge is through consultancy work, workshop seminars, short course and professional writing.

SoME offers engineering academic qualifications at Bachelor, Masters and Doctoral level. For Bachelor degree the school offer two (2) honors degree programs: Bachelor in Mechanical Engineering and Bachelor in Manufacturing Engineering with Management.

The post-graduate programs at the school specialize in the areas of Applied Mechanics, Thermo-fluids, Manufacturing Technology, Manufacturing System and Manufacturing Management.



## RESEARCH & GRADUATE STUDIES PROGRAM

School of Mechanical Engineering offers Postgraduate studies by Research in various fields of Mechanical Engineering and Manufacturing Engineering for the Degree of M.Sc. and Ph.D. Both programs are offered either full-time or part-time. The School of Mechanical Engineering has formed research units as research thrusts to spearhead research in the field of Mechanical Engineering and Manufacturing Engineering.

## MASTER OF SCIENCE (MSc) AND DOCTOR OF PHILOSOPHY (PhD): BY RESEARCH

• • • • •  
The degree can be pursued under the supervision of at least one academic staff of the School, in which the candidate is required to complete the research study within a stipulated time period.

### Research Thrust Areas: ENERGY

Energy Resources – Biomass  
Energy Conversion Technologies  
Internal Combustion Engine - Alternative Fuel Combustors  
- Gas Turbine, Incinerators  
Aerofoil, Flow in Passages, Micro Flow Sensor, Two Phase Flow

### THERMODYNAMICS AND FLUID MECHANICS

Thermal System  
Heat Transfer  
Computer Fluid Dynamics  
Fluid Mechanics  
Advanced Electronic Packaging  
Refrigeration and Air-Conditioning

### APPLIED MECHANICS

Experimental and Numerical Stress Analysis  
Dynamic Characteristics of Materials  
Instrumentation and Automatic Control  
Structural Optimization  
Noise and Vibration  
Stress and damage characterization  
Fracture Mechanics  
Experimental Mechanics

### MANUFACTURING SYSTEM & AUTOMATION

Design for Manufacture and Assembly  
Robotics & Industrial Automation  
Computer Aided Design and Computer Aided Manufacturing (CAD/CAM)  
Manufacturing System Design and Analysis  
Manufacturing Planning and Control  
Technology Management  
Machine Vision & Metrology

# 02 RESEARCH AREAS

### MANUFACTURING PROCESSES

Advanced Manufacturing Process  
Laser Applications  
Rapid Prototyping  
Tool and Die  
Advanced Materials  
Casting

### NANOFABRICATION AND FUNCTIONAL MATERIALS

Nano Engineering and Technology  
Nanofabrication  
Lithography Techniques  
Thin Films  
Smart and Functional Materials  
Shape Memory Alloys  
Materials Characterization

### BIO-ENGINEERING

Bio-materials  
Bio-mechanics & Bio-medical analysis  
Orthopaedic bio-engineering  
Bio-mechanical data mining

### INDUSTRIAL ENGINEERING

Ergonomics  
Quality & Reliability  
Artificial Intelligence in Manufacturing  
Productivity Engineering  
Facilities Planning & Design  
Process Optimization  
Production Planning & Control  
Value Engineering and Project Management

### ADVANCED COMPOSITES MATERIALS & PROCESSING

Composite Design & Assembly  
Composite Processing Technology  
Composite Machining  
Quality Inspection & Part Testing  
Composite Repair  
Static, Impact & Ballistic Characterization

### COMPUTATIONAL ENGINEERING AND DATA MINING ANALYSIS

Adaptive finite element methods  
Qualitative and quantitative data mining  
Pattern analysis  
Static and time series data analysis  
Knowledge discovery databases

