

INTRODUCTION

Functional Devices Laboratory (FDL) was established on 1st March 2012 under the Institute Of Advanced Technology (ITMA). FDL conducts innovative research in the areas of sensors, electron devices as well as energy to provide affordable enabling technology in advanced electro-optical technologies, advanced RF technologies, electronic materials and devices, autonomous sensing, micro autonomous technologies and renewable energy. We coordinate these technologies within FDL and other laboratories in ITMA, with other services agencies, industry and academia, to leverage basic and applied research opportunities for the benefit of the nation.

OBJECTIVES

- To be a leading research center in functional devices, sensor and renewable energy.
- To develop world class research laboratories in functional devices and sensors.
- To disseminate innovative knowledge and technologies through seminars, publication and conferences.

RESEARCH PROGRAMS

Sensor Technology

Sensor technology includes the study and preparation of sensing material and characterized by related transducer, signal processing and design of system or devices (including micro and nanoscale) in development of sensor to meet society and industrial demands. Sensor system includes (but not limited to) electronic sensors, biosensors, and chemical sensors. Sensor technology has a very important role as the key technology to support a wide variety of research and industrial applications. It is also a vital element that can be applicable to water security, environment and green technology.

Electron Devices

Electron Devices is a program that has been offered under this laboratory starting from 2012. This program aims to perform basic and applied research in the growth of semiconductors and related electronic materials, as well as micro analysis with the aim of developing new and improved electronic devices. The vision in this area is next generation electronic devices and sensors for improved performance and reliability in complex environments. Research areas include nanoelectronics and MEMS, RF and energy harvesting.

RESEARCH AND SUPPORT FACILITIES

- Field Emission Scanning Electron Microscope (FESEM)
- Energy Dispersive X-Ray Spectroscopy (EDX)
- Raman Spectroscopy
- X-Ray Diffractometer (XRD)
- Thermogravimetric Analyzer (TGA/DSC)
- Fourier Transform Infra-red (FTIR)
- UV-Visible Spectrophotometer (UV-Vis)
- Atomic Absorption Spectroscopy (AAS)
- Chemical Vapour Deposition (CVD)
- High Temperature Furnace
- High Shear Homogenizer
- High Frequency Probe Sonicator
- PCB Fabrication Machine
- Surface Area Analyzer (BET)
- Gas Chromatography (GC)
- High Performance Liquid Chromatography (HPLC)
- Nano Sizer
- Hysteresis Graph System
- Optical Microscope
- Wire Bonder
- Universal Testing Machine (UTM)
- High Energy Ball Mill

Name	Email	Expertise
Assoc. Prof. Dr. Suhaidi Shafie	suhaidi@upm.edu.my	CMOS Image Sensor, Mix-signal IC Design, Solar Cell
Prof. Dr. Nor Azah Yusof	azahy@upm.edu.my	Nanosensors, Molecular Imprinted Polymer, DNA Based Sensor
Assoc. Prof. Dr. Mohd Nizar Hamidon	mnh@upm.edu.my	Microelectronics (Sensor Technology), MEMS, Devices Fabrication and Packaging, Wireless System
Dr. Janet Lim Hong Ngee	hongngee@upm.edu.my	Graphene Based Polymer Nano-composites
Dr. Suriati Paiman	suriati@upm.edu.my	Compound Semiconductor Materials Science (III-V semiconductors), Compound Semiconductor
Dr. Nasri Sulaiman	nasri@upm.edu.my	Evolvable Hardware (EHW) and Digital Signal Processing
Dr. Jaafar Abdullah	jafar@upm.edu.my	Chemical and Biosensor
Dr. Mohd Khair Hassan	khair@upm.edu.my	Energy Engineering, Control System
Dr. Yap Wing Fen	yapwf@upm.edu.my	Optical Based Sensor
Dr. Shahrul Ainliah	ainliah@upm.edu.my	Surface Chemistry, Nanolithography Analytical Chemistry
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Dr. Mohd Hanif Yaacob	hanif@upm.edu.my	Electronic & Optical Communication
Dr. Yusran Sulaiman	yusran@upm.edu.my	Electroanalytical Chemistry and Materials Chemistry
Dr. Reza Hajian	rezahajian@upm.edu.my	Evolvable Hardware (EHW) and Digital Signal

ACADEMIC REQUIREMENTS FOR ADMISSION

PhD Program

- Bachelor Degree In Science or Engineering with minimum CGPA 3.75
- Master Degree in Science or Engineering (with thesis) or without thesis with minimum CGPA 3.25

COURSEWORK CREDIT REQUIREMENT

<ul style="list-style-type: none"> • Master Degree with Thesis (full research) • Master Degree in Science or Engineering (with thesis and coursework) with CGPA ≥ 3.50 • Master Degree (without thesis) with CGPA ≥ 3.75 • Bachelor with CGPA ≥ 3.75 (First Class Upper) 	Not Required
<ul style="list-style-type: none"> • Master Degree in Science or Engineering (with thesis and coursework) with CGPA > 3.50 • Master Degree (without thesis) with CGPA > 3.50 	6 – 12 Credits

Master with Thesis Program

- Bachelor Degree in Science or Engineering with CGPA of at least 2.50 (Second Class Lower); or
- Bachelor Degree in Science or Engineering with CGPA < 2.50 and of at least three (3) years working experience in relevant field.

COURSEWORK CREDIT REQUIREMENT

<ul style="list-style-type: none"> • Bachelor Degree in Science or Engineering with CGPA 3.25 	Not Required
<ul style="list-style-type: none"> • Master Degree in Science or Engineering (with thesis and coursework) with CGPA > 3.50 • Master Degree (without thesis) with CGPA > 3.50 	6 – 12 Credits

Please apply online via www.sgs.upm.edu.my and send your application and supporting documents to the address below :

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**FUNCTIONAL
DEVICES
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