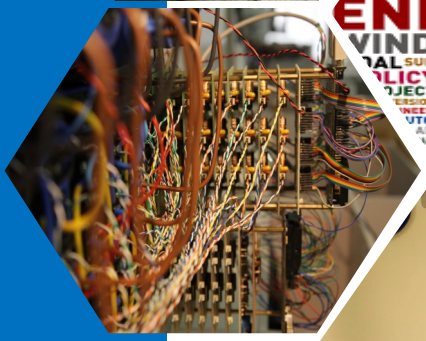

PROSPECTUS

MASTER OF RENEWABLE ENERGY (MRE) PROGRAMME

Master by Coursework

Accredited Programme by
Malaysian Qualification Agency (MQA)
MQA / SWA10820

Academic session
2026/2027

UNIVERSITI MALAYA

UMPEDAC

Institute for Advanced Studies (IAS)

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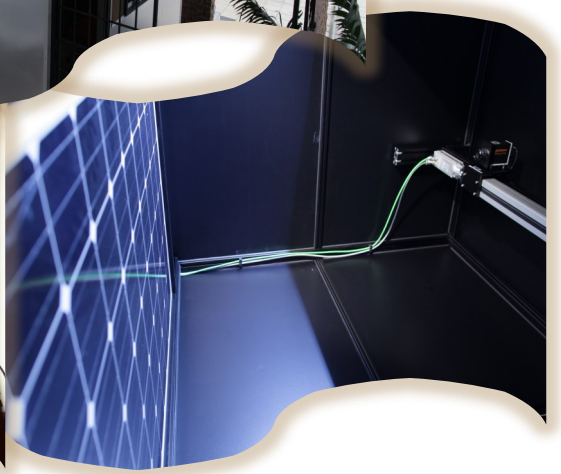


MISSION, VISION, and CORE VALUES of UNIVERSITI MALAYA

UNIVERSITI MALAYA

Universiti Malaya (UM), Malaysia's oldest university, is situated on a 900 acre campus in the southwest of Kuala Lumpur, the capital of Malaysia. It was established in April 1949 in Singapore with the merger of the King Edward VII College of Medicine (founded in 1905) and Raffles College (founded in 1928).

The Universiti Malaya derives its name from the term 'Malaya' as the country was known as then. The Carr-Saunders Commission, which recommended the setting up of the university, noted in its Report in 1948: *"The Universiti Malaya would provide for the first time a common centre where varieties of race, religion and economic interest could mingle in joint endeavour. For a Universiti Malaya must inevitably realise that it is a university for Malaya."*

The growth of the University was very rapid during the first decade of its establishment and this resulted in the setting up of two autonomous Divisions in 1959, one located in Singapore and the other in Kuala Lumpur. In 1960, the government of the two territories indicated their desire to change the status of the Divisions into that of a national university. Legislation was passed in 1961 and the Universiti Malaya was established on 1st January 1962.

On June 16th 1962, Universiti Malaya celebrated the installation of its first Chancellor, Tunku Abdul Rahman Putra Al-Haj, who was also the country's first prime minister. The first Vice-Chancellor was Professor Oppenheim, a world-renowned Mathematician. Currently, His Royal Highness The Sultan of Perak Darul Ridzuan is the Chancellor of UM.

Vision

A global university impacting the world.

Mission

Pushing the boundaries of knowledge and nurturing aspiring leaders.

The Core Values of Universiti Malaya

Passion

Oneness

Integrity

Sincerity

Empathy

EDUCATIONAL GOALS

Universiti Malaya's Educational Objective is to provide a transformative education that empowers students with the necessary knowledge, skills and ethical values to enable them to advance knowledge, promote social justice, drive sustainable development and contribute meaningfully to society.

Graduates of the Universiti Malaya will be able to:

- Apply knowledge and skills with an innovative mindset towards sustainability and inclusivity.
- Utilize effective and advanced information management methods to make data-informed decisions and achieve goals in line with the relevant professional standards.
- Engage effectively with academia, public authorities, industries, and the community, in carrying out professional and social responsibilities.
- Internalize and demonstrate integrity, resilience, agility, and empathy in personal, professional, and global community engagement. Core values for students:

DIRECTOR'S FOREWORD

Salam Sejahtera and Warm Greetings.

With the mission of empowering Malaysia with the capability to become a regional leader in power energy, UMPEDAC rose through the ranks to emerge as the nationally acclaimed Higher Institution Centre of Excellence (HICoE) in Engineering Research Cluster in 2009.

Being part of the reputable Universiti Malaya (UM), the foremost and premier Research University in Malaysia, UMPEDAC is undoubtedly a suitable place for pursuing postgraduate studies in the field of energy.

In Malaysia, the evolution of renewable energy has been marked by a diverse mix of solar, hydropower, biomass, biofuels, and biogas projects. Starting with hydropower in the early 20th century, Malaysia has now prioritized renewable energy for sustainable development and energy security.

The nation is committed to reducing its reliance on fossil fuels, with renewable energy systems, supported by initiatives like Net Energy Metering (NEM) and Supply Agreement of Renewable Energy (SARE), seeing rapid growth. Policies such as the Renewable Energy Act 2010 and the Malaysia Renewable Energy Roadmap (MyRER) provide incentives and strategic direction for the sector, aiming to achieve national climate goals and a net-zero emissions target by 2050.
To cater the needs, Master of Renewable Energy (MRE) was designed to produce experts in the field of renewable energy. The programme aims to develop human resources with the knowledge and skills to advance research and development of effective measures to address energy related issues.

I believe the Master of Renewable Energy Programme that you have chosen to pursue will be of great benefit to you in your future career and it will empower you with the capability to contribute to the society. I hope that you find the information in this prospectus useful in guiding you through your time as a student here. I wish you every success in your studies.

Lastly, I again welcome you to UMPEDAC and encourage you to take advantage of all it has to offer.

Professor Ir. Ts. Dr. Jeyraj Selvaraj

UMPEDAC'S VISION, MISSION and OBJECTIVES

About Us

Despite its humble beginnings in the year 2000, a small research laboratory with only a handful of engineering students with limited funds and facilities, UMPEDAC rose through the ranks to emerge as the nationally acclaimed Higher Institution Centre of Excellence (HICoE) in Engineering Research Cluster in 2009 that it is today. UMPEDAC's full range of services today other than the research work and the consultations include professional testing of solar farm applications, continuous professional development programs in practical engineering applications, provision of specialist research facilities for hire, and the postgraduate programs on offer across all fields of power and energy.

Vision

Empowering Malaysia with the capability to become a regional leader in power energy.

Mission

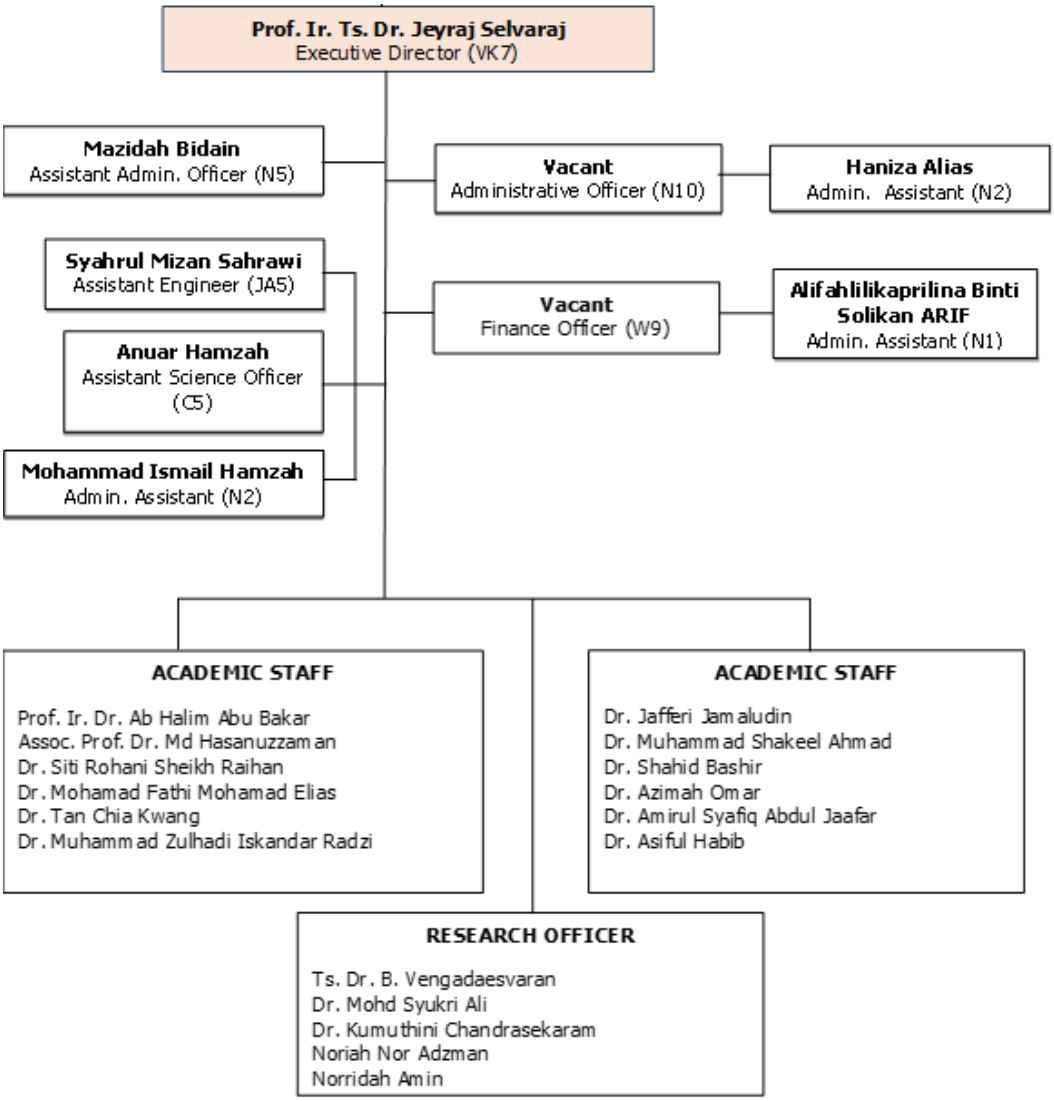
Researching innovations that not only benefit the nation and improve quality of life, but also raise Malaysia's standard of research in power energy and its related fields

Objectives

1) Pioneering local research in power energy and spurring its growth towards world-class standards;
2) Imparting the knowledge and the expertise gained from R&D;
3) Centralizing knowledge, to become a knowledge hub to both academic institutions and related industries, for applications in power energy;
4) Production of knowledgeable, skilled, capable, and competent graduates;
5) The encouragement of development of new technology through research, among both students and engineers.

UMPEDAC's Organizational Structure

UMPEDAC'S PROFILE
ORGANIZATIONAL STRUCTURE



UMPEDAC'S PROFILE
Academic Staff

Prof. Ir. Ts. Dr. Jeyraj a/l Selvaraj
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Dr. Mohamad Fathi Mohamad Elias
MIEEE, MIET
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UMPEDAC'S PROFILE
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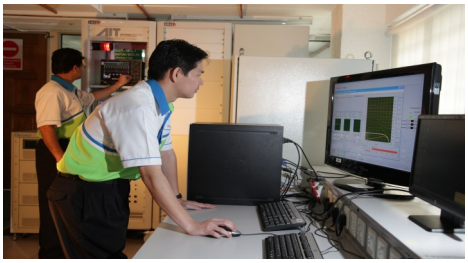
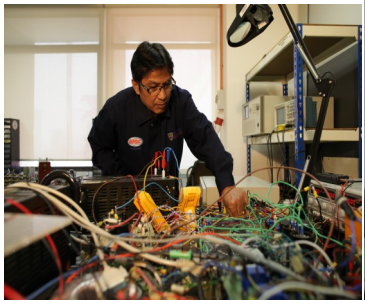
Expertise: Electric machine design & drive, Electric vehicle, Renewable Energy.

UMPEDAC'S PROFILE: Research Facilities

Renewable Energy Research Laboratory



ISO/IEC 17025 Accredited Lab. PV Solar Energy Inverter



Power Conversion Research Laboratory

Solar Cell Research Laboratory

Smart Transportation Research Laboratory

Materials Research Laboratory

Hydrogen Research Laboratory

Smart Grid Research Laboratory

UMPEDAC Solar Garden

UMPEDAC's Success Stories

UMPEDAC'S PROFILE: Success Stories

2008 AKSA

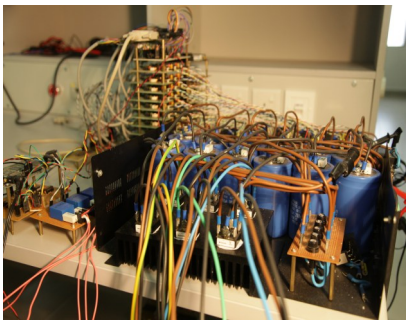
UMPEDAC partnered with MS Elevators Sdn Bhd won the 2008 Anugerah Kualiti Sektor Awam (AKSA) Award. Seen in the picture is Y. Bhg. Dato' Poh Kim Seng, Chairman of MS Elevators receiving the award.

2009 HICoE

UMPEDAC was officially recognized as a HICoE on 30th October 2009 in the niche of Renewable Energy. HICoE was established to achieve the National Higher Education Strategic Plan (PSPTN) which aims to produce 20 National Centres of Excellence by 2020.

HLAF 2014 Lifetime Achievement Award

UMPEDAC received the 2014 HLAF Lifetime Achievement Award from HLAF Chairman, Y.A.Bhg. Tun Dr. Mahathir Mohamad on 9th June 2014. This award was honour owing to the outstanding of UMPEDAC's research's output among other research groups around the world in the field of science and technology.



IEEE IAS 2014 Award

UMPEDAC researchers Dr. Mohamad Fathi Mohamad Elias, Professor Ir. Dr. Nasrudin Abd Rahim, and Professor Ir. Dr. Hew Wooi Ping won the 2nd place for IEEE Industry Application Society (IAS) prestigious award for the paper titled "Asymmetrical Transistor Clamped H-Bridge Cascaded Multilevel Inverter". The award was presented in the IEEE Industry Application Society Annual Meeting in Vancouver, Canada, on 6th October 2014.

2016 Malaysia's Rising Star Award

Prof. Ir. Dr. Nasrudin and Dr. Che Hang Seng received the Malaysia's Rising Star Awards under "International Collaboration" and "Frontier Researcher", categories, on 1st November 2016 at the Putrajaya Marriott Hotel.

UMPEDAC'S PROFILE: Success Stories

2017 LABORATORY ACCREDITATION – IEC/ISO 17025

UMPEDAC was officially recognized as a HICoE on 30th October 2009 in the niche of Renewable Energy. HICoE was established to achieve the National Higher Education Strategic Plan (PSPTN) which aims to produce 20 National Centres of Excellence by 2020.

2018 HIGHLY CITED MALAYSIAN RESEARCHER

UMPEDAC partnered with MS Elevators Sdn Bhd won the 2008 Anugerah Kualiti Sektor Awam (AKSA) Award. Seen in the picture is Y. Bhg. Dato' Poh Kim Seng, Chairman of MS Elevators receiving the award.

PECIPTA 2022

UMPEDAC researchers Dr. Muhammad Shakeel Ahmad and Dr. Vengadaesvaran Balakrishnan won silver medals for their innovation "Anti-viral and Anti-bacterial coating for PPE Material" and "Scalable and standalone solar oxyhydrogen incinerator assembly for controllably decomposing waste materials." The award was presented in PECIPTA 2022 at Dewan Tuanku Canselor, Universiti Malaysia Kelantan.

2024 Top Research Scientists Malaysia (TRSM)

Prof. Ir. Ts. Dr. Jeyraj Selvaraj has been formally awarded the 2024 Top Research Scientists Malaysia by the Academy of Sciences Malaysia. This honour reflects his outstanding contributions and achievements in his field of expertise, underscoring his role as a leader in advancing science, technology, and innovation.

ACADEMIC CALENDAR

ACADEMIC CALENDAR 2026/2027 ACADEMIC SESSION
(MASTER AND DOCTORATE LEVEL)
AMENDMENT

SEMESTER I					
Orientation *(Week of Welcome) - WOW*	1	week	26.09.2026	-	04.10.2026
Lectures	8	weeks*	05.10.2026	-	29.11.2026
Mid Semester I Break	1	week	30.11.2026	-	06.12.2026
Lectures	6	weeks*	07.12.2026	-	17.01.2027
Revision Week	1	week*	18.01.2027	-	24.01.2027
Semester I Final Examination	2	weeks*	25.01.2027	-	04.02.2027
Semester I Break	3	weeks*	05.02.2027	-	28.02.2027
	22	weeks			
SEMESTER II					
Lectures	7	weeks*	01.03.2027	-	18.04.2027
Mid Semester II Break	1	week	19.04.2027	-	25.04.2027
Lectures	7	weeks*	26.04.2027	-	13.06.2027
UM iFest 2027	*1*	*week*	*08.06.2027*	-	*11.06.2027*
(No teaching and learning (T&L) activities shall be conducted during this period. Participation is mandatory for all final-year students / students undertaking the Final Year Project (FYP).)					
Revision Week	1	week	14.06.2027	-	20.06.2027
Semester II Final Examination	2	weeks	21.06.2027	-	04.07.2027
Semester II Break	3	weeks	05.07.2027	-	25.07.2027
	21	weeks			
SPECIAL SEMESTER					
Lectures	7	weeks*	19.07.2027	-	05.09.2027
Special Semester Final Examination	1	week	06.09.2027	-	12.09.2027
Special Semester Break	1	week*	13.09.2027	-	19.09.2027
	9	weeks			

* Note: Special semester is not available for students who enrol into the Master of Renewable Energy starting 2024/2025 academic year.

PROGRAMME TIMETABLE

Note:
- Research Project is offered in both Semester 1 and Semester 2
- The subject offered may change from time to time

TIMETABLE FOR SEMESTER 1

COORDINATOR: Dr. Siti Rohani Sheikh Raihan

DAY	TIME	COURSE CODE	COURSE TITLE	LECTURER	VENUE
Saturday	9.00 am - 12.00 noon	HQA7014	Energy Storage Technology	Dr. Mohamad Fathi Mohamad Elias	Lecture Room, Level 20, Wisma R&D
	12.00 noon - 3.00 pm	HQA7006	Foundation of Renewable Energy	Dr. Azimah Omar	
	3.00 pm - 6.00 pm	HQA7001	Research Methodology	Dr. Siti Rohani Sheikh Raihan	
Sunday	9.00 am - 12.00 noon	HQA7003	Energy and Sustainable Development	Dr. Shahid Bashir	Lecture Room, Level 20, Wisma R&D
	12.00 noon - 3.00 pm	HQA7015	Low Carbon Buildings	Dr. Thibeorchews Prasankumar	
	3.00 pm - 6.00 pm	HQA7005	Energy Efficiency and Management	Ts. Dr. Jafferi Jamaludin	

TIMETABLE FOR SEMESTER 2

COORDINATOR: Dr. Siti Rohani Sheikh Raihan

DAY	TIME	COURSE CODE	COURSE TITLE	LECTURER	VENUE
Saturday	9.00 am - 12.00 noon	HQA7018	Solar Energy	Prof. Ir. Ts. Dr. Jeyraj Selvaraj	Lecture Room, Level 20, Wisma R&D
	12.00 noon - 3.00 pm	HQA7011	Smart Grid	Dr. Tan Chia Kwang	
	3.00 pm - 6.00 pm	HQA7004	Energy Policy	Assoc. Prof. Dr. Md. Hasanuzzaman	
Sunday	9.00 am - 12.00 noon	HQA7019	Hydro Energy	Dr. Asiful Habib	Seminar Room, Level 15, Wisma R&D
		HQA7021	Hydrogen Technology	Dr. Muhammad Shakeel Ahmad	Lecture Room, Level 20, Wisma R&D
	12.00 noon - 3.00 pm	HQA7012	Bioenergy	Assoc. Prof. Dr. Lee Hwei Voon / Prof. Dr. Juan Joon Ching	
	3.00 pm - 6.00 pm	HQA7016	Energy Economics	Dr Muhammad Zulhadi Iskandar Radzi	

PLAGIARISM AND WRITING ETHICS

(In accordance with Section 6 of Plagiarism and writing Ethics, Part II, General Discipline, Universities and University Colleges Act, 1971, University of Malaya (Discipline of Students) Rules 2024)

1. Plagiarism and writing ethics

(1) A student shall not plagiarize any idea, writing, data or invention belonging to another person.

(2) For the purposes of this rule, plagiarism includes:

(a) the act of taking an idea, writing, data or invention of another person and claiming that the idea, writing, data or invention is the result of one's own findings or creation; or

(b) an attempt to make out or the act of making out, in such a way, that one is the original source or the creator of an idea, writing, data or invention which has actually been taken from some other source.

(3) Without prejudice to the generality of sub rule (2) a student plagiarizes when he;

(a) publishes, with himself as the author, an abstract, article, scientific or academic paper, or book which is wholly or partly written by some other person;

(b) incorporates himself or allows himself to be incorporated as a co-author of an abstract, article, scientific or academic paper, or book, when he has not at all made any written contribution to the abstract, article, scientific or academic paper, or book;

(c) forces another person to include his name in the list of co-researchers for a particular research project or in the list of co-authors for a publication when he has not made any contribution which may qualify him as a co-researcher or co-author;

(d) extracts academic data which are the results of research undertaken by some other person, such as laboratory findings or field work findings or data obtained through library research, whether published or unpublished and incorporate those data as part of his academic research without giving due acknowledgement to the actual source;

(e) uses research data obtained through collaborative work with some other person, whether or not that other person is a staff member or a student of the University, as part of another distinct personal academic research of his, or for a publication in his own name as sole author, without obtaining the consent of his co-researchers prior to embarking on his personal research or prior to publishing the data;

(f) transcribes the ideas or creations of others kept in whatever form, whether written, printed or available in electronic form, or in slide form, or in whatever form of teaching or research apparatus, or in any other form, and claims whether directly or indirectly that he is the creator of that idea or creation;

(g) translates the writing or creation of another person from one language to another whether or not wholly or partly, and subsequently presents the translation in whatever form or manner as his own writing or creation; or
(h) extracts ideas from another person's writing or creation and makes certain modifications without due reference to the original source and rearranges them in such a way that it appears as if he is the creator of those ideas

2. Appearance for examination

(1) Where a student's course of study entails his appearance for an examination and he is not otherwise debarred from such examination, he shall not fail to appear for the examination without the prior permission of the Dean of the Faculty, or the Head of the School, Centre, Academy or Institute, as the case may be.
(2) Where the circumstances do not permit such prior permission to be obtained, the student shall, as soon as possible thereafter, satisfy the Dean or the Head, as the case may be, with regard to his absence and obtain approval in respect thereof.

3. Conduct relating to examination

(1) No student shall:

(a) take any book, paper, document, picture or other things, except those authorized by the examiner, into or out of an examination room, or receive any book, paper, document, picture or other things from any other person while in the examination room, except that a student may, while he is in the examination room, receive from the invigilator such books. papers, documents. pictures or other things which have been recommended by the examiner or Board of Examiners, and authorized by the Vice-Chancellor;
(b) write, or have it written by another person, any information or diagram which may be relevant to the examination he is sitting for, on his hand or on any other part of his anatomy, or on his apparel or clothing;
(c) communicate with any other student during an examination by whatever means; or
(d) cheat or attempt to cheat or conduct himself in a manner which can be construed as cheating or attempting to cheat in, an examination , while the examination is being conducted.

4. Disciplinary punishment

A student who commits a disciplinary offence under these Rules and is found guilty of the offence shall be liable to any one or any appropriate combination of two or more of the following punishments:

(a) a warning;
(b) community service as regulated by the Board, not exceeding 24 hours;
(c) a fine not exceeding five hundred ringgit;
(d) exclusion from any specific part or parts of the University for a specified period;
(e) expulsion from staying in the hostel;
(f) suspension from examinations for academic disciplinary offences, as determined by the University. ;
(g) suspension from being a student of the University for a specified period.

GENERAL REQUIREMENTS

Registration as a Candidate

1. Any person who has been offered by the University to pursue a Master's Degree programme of study and who accepts the said offer is required to register in accordance with the regulations under the Universiti Malaya (Master's Degree) Regulations 2024.

2. Every candidate who is registered for a Master's Degree programme of study offered to him shall register on a continuous basis with the University.

3. Any candidate who fails to register continuously for a duration of two (2) semesters with the University shall cease to be a student and his name shall be removed from the register of students of the University.

Minimum and Maximum Duration

The minimum and maximum duration for the Master's Degree programme of study is:

Minimum duration	: 2 semesters (1 years)
Maximum duration	: 8 semesters (4 years)

Note: The minimum and maximum duration of a programme of study may vary from that stated above and is subject to approval by the Ministry of Higher Education.

Suspension of a Candidate's Programme of Study

The duration of suspension of a candidate's programme of study where punishment has been imposed under the University of Malaya (Discipline of Students) Rules 1999 shall not be taken into account as part of the maximum duration of the programme of study.

Termination of Candidature

The Senate has the right to terminate the candidature of a candidate who is found to have provided false information in connection with admission to the University or commits an act of academic dishonesty other than those stated in the University of Malaya (Discipline of Students) Rules 1999 which in the view of the Senate is inappropriate and detrimental to the image of the University.

GENERAL REQUIREMENTS

Bahasa Malaysia or *Bahasa Melayu* Requirement

1. A candidate who is a Malaysian citizen shall be required, before being conferred the degree, to possess at least a:

(a) Pass grade in Bahasa Malaysia or Bahasa Melayu at the Sijil Pelajaran Malaysia level;

(b) Level III in the Sijil Bahasa Malaysia or Bahasa Melayu Universiti or at an equivalent level;

(c) Pass grade in the Bahasa Malaysia or Bahasa Melayu course as recognised by the University; or

(d) Pass the Bahasa Malaysia or Bahasa Melayu exemption assessment as set by the University.

2. A non-citizen candidate is required to attend at a satisfactory level a *Bahasa Malaysia or Bahasa Melayu* course conducted by the University before being conferred his degree unless he obtains at least a:

(a) Pass grade in Bahasa Malaysia or Bahasa Melayu at the Sijil Pelajaran Malaysia level;

(b) Level III in the Sijil Bahasa Malaysia or Bahasa Melayu Universiti or at an equivalent level;

(c) Pass grade in the Bahasa Malaysia or Bahasa Melayu course as recognised by the University; or

(d) Pass the Bahasa Malaysia or Bahasa Melayu exemption assessment as set by the University.

MASTER OF RENEWABLE ENERGY: PROGRAMME OVERVIEW

Introduction

Master of Renewable Energy Programme is designed to produce experts in the field of Renewable Energy among local and international students. This program offers opportunity for professional and graduate students with advanced understanding in various core applications in Renewable Energy technology and management. The programme aims to develop human resources with the knowledge and skills to advance research and development of effective measures to address current energy issues. It also offers an education that is directly relevant to the latest advancements in the Renewable-Energy-related industry.

Entry Requirements

Qualification Requirements

Candidates must have a Bachelor's Degree with Honours not less than 3.0 CGPA in related field of study or an equivalent degree; OR other qualifications approved by the Senate from time to time.

However, applicants with a Bachelor Degree with CGPA of 2.5 to 2.99 can also be considered, but he/she must fulfill at least ONE (1) of the following criteria: Has working experience in related field; **OR**, has one (1) ISI publication; **OR**, a scholarship holder; **OR**, a UM graduate.

Language Requirements

Foreign candidates are required to:

Have at least IELTS Band 5.5 or TOEFL 550 if their first degree is from a university where English is not the medium of instruction; OR pass an English proficiency test approved by the University.

* Note: Subject to changes from time to time

MASTER OF RENEWABLE ENERGY: Opportunity to Study in Japan

Opportunity to Study in Japan

Master of Renewable Energy is a matching programme for Master of Energy Science with Kyoto University, Japan under the University of Malaya - Kyoto University, Double Degree Memorandum of Agreement on 16th August 2008. Students can be awarded two Master Degrees from Universiti Malaya and Kyoto University, Japan by means of overseas study programme with credit transfer.

Curriculum for Students of Universiti Malaya

The Double Master's Degree Programme will last for three years, including a minimum period of one year (two regular semesters) at Kyoto University. The study curriculum for students of the Double Master's Degree Programme to obtain a Master's Degree from Universiti Malaya and a Master's Degree from Kyoto University are as follows:

Students of Universiti Malaya must be enrolled in a Master's programme in Institute for Advanced Studies at Universiti Malaya. To obtain a master's degree at Universiti Malaya, they are required to meet the degree requirements of the faculty in which they are enrolled. The specific components of the curriculum are as follows:

i) Academic courses taught at Universiti Malaya providing at least 30 credits and 12 credits of Research Project.
ii) A master's thesis which is written and submitted according to Universiti Malaya's regulations.
iii) A final oral examination which is conducted according to Universiti Malaya's regulations.

Credit Transfer

To obtain a Master's Degree from Kyoto University, students from Universiti Malaya are required to meet the following general conditions:

i) The student must be enrolled in a master's programme in the Graduate School of Energy Science at Kyoto University.
ii) The student can transfer maximum of 15 credits from Universiti Malaya which is equivalent to 10 credits at Kyoto University.
iii) The student must submit a master's thesis to Kyoto University that is different from the thesis submitted to Universiti Malaya, and must pass the final oral examination as set by Kyoto University.

* Note: Subject to changes from time to time

MASTER OF RENEWABLE ENERGY: Opportunity to Study in Japan

Student Selection Procedures

UMPEDAC will select students per academic session of appropriate ability and academic standard to participate in this programme. Students selected for the programme must fulfil the following requirements:

i) A relevant undergraduate specialization
ii) Appropriate English language ability (IELTS or TOEFL)
iii) An appropriate academic performance record
iv) Recommendation letters
v) Interviews

Conferral of Degree

Upon successful completion of the Double Master Degree Programme, students who meet the graduation requirements will be conferred a Master's Degree from Universiti Malaya, Malaysia and a Master's Degree from Kyoto University, Japan.

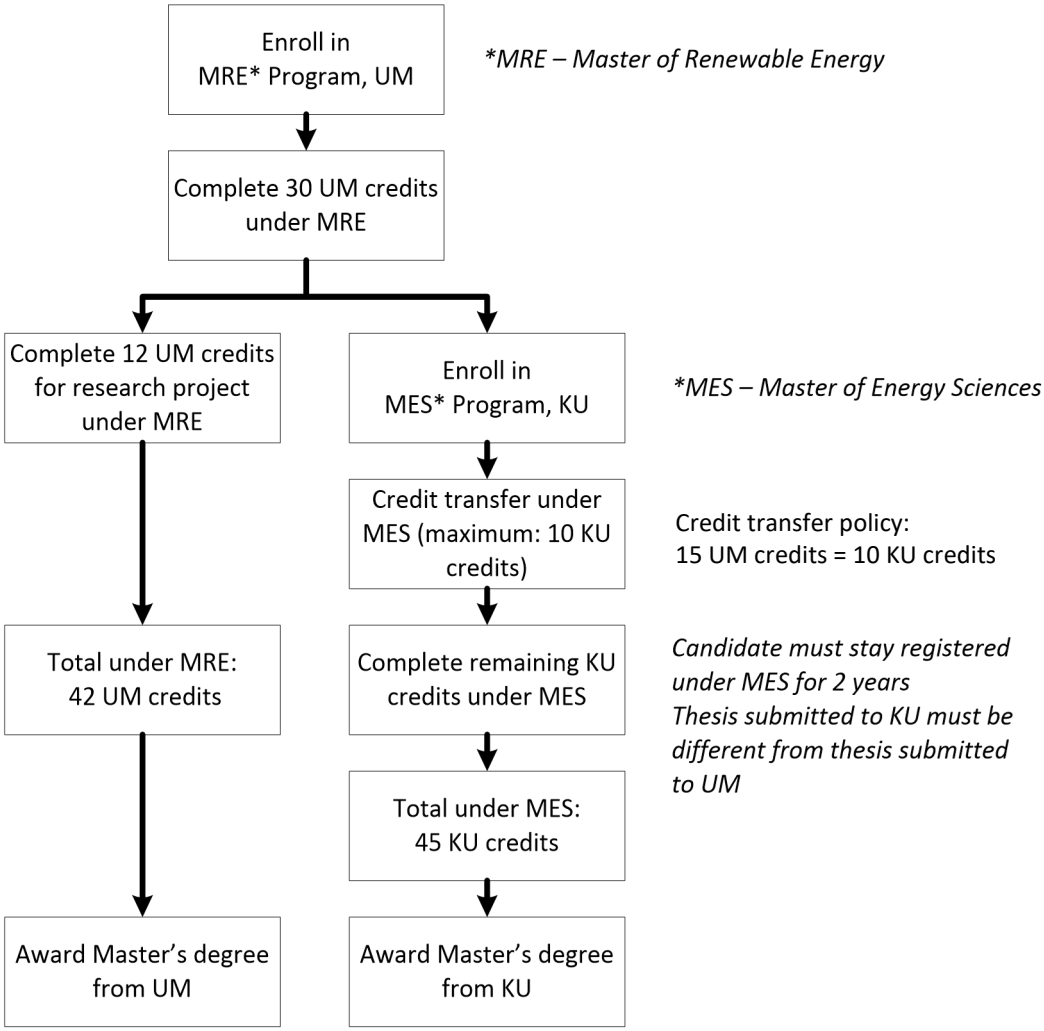
Tuition and Fees

Each student will pay the required tuition and other fees to the home institution for the duration of their study. This Double Master Degree Programme constitutes a student exchange programme, and so tuition, admission, examination, and registration fees at the host institution are waived.

Note:
- The requirements of enrolling in this Double Degree Program may change from time to time

MASTER OF RENEWABLE ENERGY: Opportunity to Study in Japan

Process Flow towards Completion of Double Master Degree Programme



MASTER OF RENEWABLE ENERGY: Programme Structure

Programme Structure

The programme has a total of forty two (42) credit hours consisting of:

a. Five (5) core courses whereby each course carries three (3) credit hours; **AND**
b. Research Project, twelve (12) credit hours; **AND**
c. Five (5) elective courses whereby each course carries three (3) credit hours; OR
d. Any other courses offered by UMPEDAC.

Details of the courses offered are according to those approved by the Senate from time to time, upon the acknowledgement by the IAS, and the candidate will be informed at the beginning of each session.

The list of courses approved by the Senate and study plan for the degree of Master of Renewable Energy is as stated below.

Semester I			
Component	Course Code	Course Title	Credit Hours
Core Course	HQA 7001	Research Methodology	3
	HQA 7003	Energy and Sustainable Development	3
	HQA 7005	Energy Efficiency and Management	3
	HQA 7006	Foundation of Renewable Energy	3
	HQA 7022	Research Project (P1)	6
Choose 1			
Elective Course	HQA7014	Energy Storage Technology	3
	HQA7015	Low Carbon Buildings	3
Total Credit			21

MASTER OF RENEWABLE ENERGY: Programme Structure

Semester II				Total Credit Hours
Component	Course Code	Course Title	Credit Hours	27
Core Course	HQA7004	Energy Policy	3	
	HQA7022	Research Project (P2)	6	
Choose 4				15
Elective Course	HQA 7011	Smart Grid*	3	
	HQA 7012	Bioenergy*	3	
	HQA 7016	Energy Economics	3	
	HQA 7018	Solar Energy*	3	
	HQA 7019+	Hydro Energy*	3	
	HQA 7021+	Hydrogen Technology	3	
Total Credit			**21**	**42**

Note:

1) For elective courses to be offered, the minimum number of students must be more than 10 registered students at any time.
2) Course offered, subjected to the availability of lecturer of the specific course and can change from time to time
3) * Course content may contain technical aspect.
4) + Courses are conducted simultaneously.

Programme Learning Outcome

MASTER OF RENEWABLE ENERGY: Programme Learning Outcomes

Programme Learning Outcomes

The quality of this programme is ultimately assessed by the capability of the candidates to carry out their roles and responsibilities in society. The programme learning outcomes are reflected to the eight (8) MQF (Malaysian Qualification Framework) learning outcomes:

Programme Learning Outcomes

PLO1	*Demonstrate expertise in the renewable energy field;*
PLO2	*Produce solutions to problems using scientific skills and critical thinking in the field of renewable energy;*
PLO3	*Translate the knowledge learnt into practical skills in renewable energy field;*
PLO4	*Managing information in digital age for lifelong learning in the field of renewable energy;*
PLO5	*Demonstrate ability to communicate and work as a team;*
PLO6	*Demonstrate leadership quality through effective communication among renewable energy partners and agencies;*
PLO7	*Demonstrate entrepreneurial mindset in dealing with energy related projects;*
PLO8	*Conduct research with minimum supervision and adhere to legal, ethical and professional practice codes in areas related to renewable energy;*

Pro-forma

PRO-FORMA: Research Methodology (HQA 7001)

Academy/Faculty/Centre	Institute for Advanced Studies (IAS)
Course Pre-requisite(s)/ Minimum Requirement(s)	N/A
Student Learning Time (SLT)* Credit*	120 hours 3
Course Learning Outcomes*	By the end of this course, student will be able to: 1. Formulate a problem statement and research questions. 2. Analyse critically the literature review based on authoritative resources in their respective fields of research. 3. Write a research proposal/report. 4. Perform oral presentation of the research proposal.
Synopsis of Course Contents	This course begins with introduction to research methodology, literature review and scientific research method. Next, research proposal, paper and report writing techniques will be introduced, including Endnote/Mendeley software training. Ethical issues and university research police will be discussed next. Finally, a presentation on research proposal will be conducted at the end of the course.
Learning Strategies	Lectures, online learning, presentation seminar
Assessment Weightage*	Continuous assessment : 100% Final examination : 0%

Pro-forma

PRO-FORMA: Research Project (HQA 7002)

Academy/Faculty/Centre	Institute for Advanced Studies (IAS)
Course Pre-requisite(s)/ Minimum Requirement(s)	N/A
Student Learning Time (SLT) Credit	480 12
Course Learning Outcomes*	At the end of the course, students are able to: 1. Perform literature review on research topics 2. Manage a methodology to carry out research. 3. Evaluate data from the experiment /survey. 4. Write a scientific report based on the research results. 5. Present the scientific report based on the research results.
Synopsis of Course Contents	This course starts with reviewing literature on a specific research topic. A research methodology plan will be developed next. Data collection, data interpretation and report writing are carried out to complete the project before presenting the results at the end of the course.
Learning Strategies	Assignments, discussion
Assessment Weightage*	Final assessment : 100% Final examination : 0%

Pro-forma

PRO-FORMA: Energy and Sustainable Development (HQA 7003)

Academy/Faculty/Centre	Institute for Advanced Studies (IAS)
Course Pre-requisite(s)/ Minimum Requirement(s)	N/A
Student Learning Time (SLT)* Credit*	120 hours 3
Course Learning Outcomes*	At the end of this course, students are able to: 1. Use the concept of sustainable development in daily life and policy making. 2. Assess the performance of energy systems using Life Cycle Assessment. 3. Analyze the feasibility of different low carbon energy technologies.
Synopsis of Course Contents	This course presents the development of energy technology, energy resources, and energy technologies available today, and of some emerging technologies for the future. The concept of sustainable energy which is defined as a living harmony between the equitable of energy services to all people and preservation of the earth for future generations will analysed. Life cycle assessment of energy systems and infrastructure configurations for energy delivery is one of the aspect that this course is going to emphasis. This course will examine the broader aspects of energy use from the viewpoints of sustainability, resource availability, technical performance, environmental effects, economics and a system perspective. Finally policies involved in sustainable energy and issues related to energy in developing countries will be discussed.
Learning Strategies	Lecture, assignment and presentations
Assessment Weightage*	Continuous assessment : 50% Final examination : 50%

Pro-forma

PRO-FORMA: Energy Policy (HQA 7004)

Academy/ Faculty/Institute/Centre	Institute for Advanced Studies (IAS)
Course Pre-requisite(s)/ Minimum Requirement(s)	N/A
Student Learning Time (SLT)* Credit*	120 hours 3
Course Learning Outcomes*	At the end of this course, students are able to: 1. Interpret concepts of policy for renewable energy. 2. Analyse the policy to implement renewable energy project. 3. Justify impacts of energy policy in social, economic and environmental issues. 4. Interpret the energy policy in current practice.
Synopsis of Course Contents	This course consists of energy supply, demand and forecasting. The renewable energy policies in Malaysia and others countries in term of feed-in-tariffs, renewable energy target, pricing law and quota, incentives rebate/tax exemption and awareness are going to be covered and emphasis. This course also focuses on the institutional structure, regulatory framework as well as international standard.
Learning Strategies	Lectures, discussion, presentations, final examination
Assessment Weightage*	Continuous assessment : 50% Final examination : 50%

PRO-FORMA: Energy Efficiency and Management (HQA 7005)

Academy/ Faculty/Institute/Centre	Institute for Advanced Studies (IAS)
Course Pre-requisite(s)/ Minimum Requirement(s)	N/A
Student Learning Time (SLT)* Credit*	120 hours 3
Course Learning Outcomes*	At the end of this course, students are able to: 1. Relate energy management and conservation to societal and environmental issues. 2. Integrate skills and knowledge in designing approaches for energy management system implementation. 3. Adapt the use of energy-efficient technologies.
Synopsis of Course Contents	This course introduces the students to the basic principles and key elements of energy management including how to conduct energy analysis. The students will learn about the various energy efficient technologies and energy conservation measures. The students will also be exposed to the good practices to achieve energy savings.
Learning Strategies	Lecture, discussion, case study, seminar presentation
Assessment Weightage*	Continuous assessment : 50% Final examination : 50%

Pro-forma

PRO-FORMA: Foundation of Renewable Energy (HQA 7006)

Academy/ Faculty/Centre	Institute for Advanced Studies (IAS)
Course Pre-requisite(s)/ Minimum Requirement(s)	N/A
Student Learning Time (SLT)* Credit*	120 hours 3
Course Learning Outcomes*	At the end of this course, students are able to: 1. Interpret concepts of thermodynamics for renewable energy. 2. Design the renewable energy system for real application. 3. Analyse the energy conversion for renewable energy application. 4. Explain the findings of the project "Foundation of Renewable Energy".
Synopsis of Course Contents	This course presents the renewable energy resources and concept of energy conversion. The students will learn about the concept of temperature, pressure, properties of substances, energy conversion, power cycle and performance analysis of different renewable energy systems. This course covers solar, bioenergy, wind, fuel cells, hydropower, ocean, wave and tidal power, as well as geothermal energy.
Learning Strategies	Lectures, discussion, presentations, final examination
Assessment Weightage*	Continuous assessment : 50% Final examination : 50%

Pro-forma

PRO-FORMA: Smart Grid (HQA 7011)

Academy/ Faculty/Centre	Institute for Advanced Studies (IAS)
Course Pre-requisite(s)/ Minimum Requirement(s)	N/A
Student Learning Time (SLT)* Credit*	120 hours 3
Course Learning Outcomes*	At the end of this course, students are able to: 1. Apply the fundamentals of electrical system in smart grid. 2. Design of electrical grid based on smart grid concept. 1. Analyze the system operation in a smart grid.
Synopsis of Course Contents	This course is designed to offer fundamental insights into the smart electrical grid technologies, mainly derived from the application of renewable energy into the conventional electrical power grid. The course will cover electrical circuit theory, conventional electrical grid topologies and operation, problems that can be addressed through smart grid technologies, areas of concern during the applications of smart grid technologies and improved grid management under renewable energy integrated grid environments. This course is suitable for electrical grid operators, policy makers and building managers. Higher emphasis on electrical content is to be expected.
Learning Strategies	Lecture, presentation
Assessment Weightage*	Continuous assessment : 50% Final examination : 50%

Pro-forma

PRO-FORMA: Bioenergy (HQA 7012)

Academy/ Faculty/Institute/Centre	Institute for Advanced Studies (IAS)
Course Pre-requisite(s)/ Minimum Requirement(s)	N/A
Student Learning Time (SLT)* Credit*	120 hours 3
Course Learning Outcomes*	At the end of this course, students are able to: 1. Execute the concepts and production principles of bioenergy. 1. Analyse the applications and economic impact of bioenergy. 2. Evaluate the environmental impacts of bioenergy. 1. Resolve the findings of the project bioenergy.
Synopsis of Course Contents	An important goal of the extended use of natural resources is replacing fossil fuels. Potentially, all global energy needs can be covered with natural resources (e.g. biomass) if the utilization is efficient enough. This course provides the introduction of bioenergy, state of the art in the field of efficient conversion of biomass, covering most technical, economical and, environmental issues such as combustion, gasification, pyrolysis, pelletizing and biogas production technologies.
Learning Strategies	Lecture, scenario-based Learning
Assessment Weightage*	Continuous assessment : 50% Final examination : 50%

Pro-forma

PRO-FORMA: Energy Storage Technology (HQA 7014)

Academy/ Faculty/Institute/Centre	Institute for Advanced Studies (IAS)
Course Pre-requisite(s)/ Minimum Requirement(s)	N/A
Student Learning Time (SLT)* Credit*	120 hours 3
Course Learning Outcomes*	At the end of this course, students are able to: 1. Explain energy storage technologies based on its operating principles. 2. Solve problems related to energy storage systems. 1. Analyze the operation of energy storage systems.
Synopsis of Course Contents	This course covers various aspects of energy storage systems from conventional to latest technologies. Higher penetration levels of renewable energy to power system pose a great challenge in energy security since its sources are mostly intermittent. Thus, energy storage systems play vital roles in stabilizing and providing sufficient energy when needed. Among the topics covered are thermal energy storage, electrochemical energy storage, flywheel storage, compressed air energy storage, pumped-hydro storage, superconducting magnetic energy storage, etc. Main elements and operation principles of each energy storage technology will be discussed. These include advantages and disadvantages, capabilities and performance as well as their typical applications.
Learning Strategies	Lecture, discussion
Assessment Weightage*	Continuous assessment : 50% Final examination : 50%

Pro-forma

PRO-FORMA: Low Carbon Buildings (HQA 7015)

Academy/ Faculty/Institute/Centre	Institute for Advanced Studies (IAS)
Course Pre-requisite(s)/ Minimum Requirement(s)	N/A
Student Learning Time (SLT)* Credit*	120 hours 3
Course Learning Outcomes*	At the end of this course, students are able to: 1. Identify the technical means by which energy demand within buildings may be reduced. 2. Apply renewable energy sources to buildings. 3. Relate how human factors and financial implications influence the choice of both demand reduction and renewable energy strategies. 4. Propose appropriate demand reduction strategies for specified buildings, including the assessment of cost implications.
Synopsis of Course Contents	This course will expose students to principles of low carbon buildings, environmental issues that lead to the advent of low carbon buildings, technical aspect of low carbon buildings, incorporation of renewable energy into building system, performance monitoring and life cycle assessment of low carbon buildings.
Learning Strategies	Lecture, discussion
Assessment Weightage*	Continuous assessment : 50% Final examination : 50%

Pro-forma

PRO-FORMA: Energy Economics (HQA 7016)

Academy/ Faculty/Institute/Centre	Institute for Advanced Studies (IAS)
Course Pre-requisite(s)/ Minimum Requirement(s)	N/A
Student Learning Time (SLT)* Credit*	120 hours 3
Course Learning Outcomes*	At the end of this course, students are able to: 1. Analyse economics of energy system 2. Compare the cost benefit of energy system. 3. Evaluate the findings of the case study "Energy Economics".
Synopsis of Course Contents	This course presents the concept of economic analysis for the decision making of projects. The students will learn about project planning, cost estimating and control, decision making, project financing and investment issues in the energy sector. This course covers economic analysis techniques that include present and future worth, rate of return, cash flow, benefit-cost ratio, payback period, taxes, inflation, replacement and depreciation.
Learning Strategies	Lecture, discussion, case study, seminar presentation
Assessment Weightage*	Continuous assessment : 50% Final examination : 50%

Pro-forma

PRO-FORMA: Solar Energy (HQA 7018)

Academy/ Faculty/Institute/Centre	Institute for Advanced Studies (IAS)
Course Pre-requisite(s)/ Minimum Requirement(s)	N/A
Student Learning Time (SLT)* Credit*	120 hours 3
Course Learning Outcomes*	At the end of this course, students are able to: 1. Illustrate solar energy system and its benefit to mankind. 2. Compare the performance of various solar energy system. 3. Evaluate and solve problems related to solar energy system.
Synopsis of Course Contents	Sun is a source of one of renewable energy, known as solar energy. It is intermittent in nature, eco-friendly and nonpolluting energy. This course will discuss the solar energy resources and solar radiation. Besides that, the concept of solar PV and cells will be introduced. Students should be able to design a basic solar system. This course will also cover the application of solar energy, solar thermal and solar collector. It will provide a platform to disseminate the knowledge regarding the fundamental of solar energy namely basic economics of solar system particularly the cost benefit analysis. Finally, project technologies related to solar energy will be discussed as well as environment impact to world.
Learning Strategies	Lecture, video presentation and discussion, seminar presentation
Assessment Weightage*	Continuous assessment : 50% Final examination : 50%

Pro-forma

PRO-FORMA: Hydro Energy (HQA 7019)

Academy/ Faculty/Institute/Centre	Institute for Advanced Studies (IAS)
Course Pre-requisite(s)/ Minimum Requirement(s)	N/A
Student Learning Time (SLT)* Credit*	120 hours 3
Course Learning Outcomes*	At the end of this course, students are able to: 1. Design of hydropower system. 2. Compare the cost benefit of hydro energy system. 3. Explain the findings of the "hydro energy" case study assignment.
Synopsis of Course Contents	This course provides an introduction to hydro energy, which includes mini- and micro-/pico- hydro energy systems. Topics covered will include site selection, system design and installation, environmental impacts, as well as regulation and economics of hydro energy. Case study on hydro energy will be used to further strengthen the understanding on the topic.
Learning Strategies	Lecture, assignment, presentation
Assessment Weightage*	Continuous assessment : 50% Final examination : 50%

Pro-forma

PRO-FORMA: Hydrogen Technology (HQA 7021)

Academy/ Faculty/Institute/Centre	Institute for Advanced Studies (IAS)
Course Pre-requisite(s)/ Minimum Requirement(s)	N/A
Student Learning Time (SLT)* Credit*	120 hours 3
Course Learning Outcomes*	At the end of this course, students are able to: 1. Apprise hydrogen based systems from production to end use. 1. Evaluate appropriate hydrogen technology according to market needs. 1. Devise solutions related to hydrogen technology.
Synopsis of Course Contents	Hydrogen as energy carrier has been deemed as one of the most suitable alternative to fossil fuels for deep decarburization of society. This course will discuss hydrogen technology from production to end use. Besides that, the concept of green hydrogen and other hydrogen production routes will be introduced. Students should be able to size a basic green hydrogen system. This course will also cover the combustion application of hydrogen along with the production of electricity using hydrogen based fuel cells. It will provide a platform to disseminate the knowledge regarding the fundamental of hydrogen technology namely basic economics of hydrogen system particularly the cost benefit analysis. Finally, project technologies related to hydrogen technology will be discussed as well as environment impact to world.
Learning Strategies	Lecture, online learning, assignment, group assignments & presentation
Assessment Weightage*	Continuous assessment : 50% Final examination : 50%

STUDENT'S GUIDELINE

POLICY ON ACADEMIC ADVISOR

Academic advisors are appointed from among the lecturers to guide the students in the planning of the students' academic programme of study.

The academic advisors are responsible for:

1) Helping the students choose courses and the number of credits the students will take before the commencement of the semester.

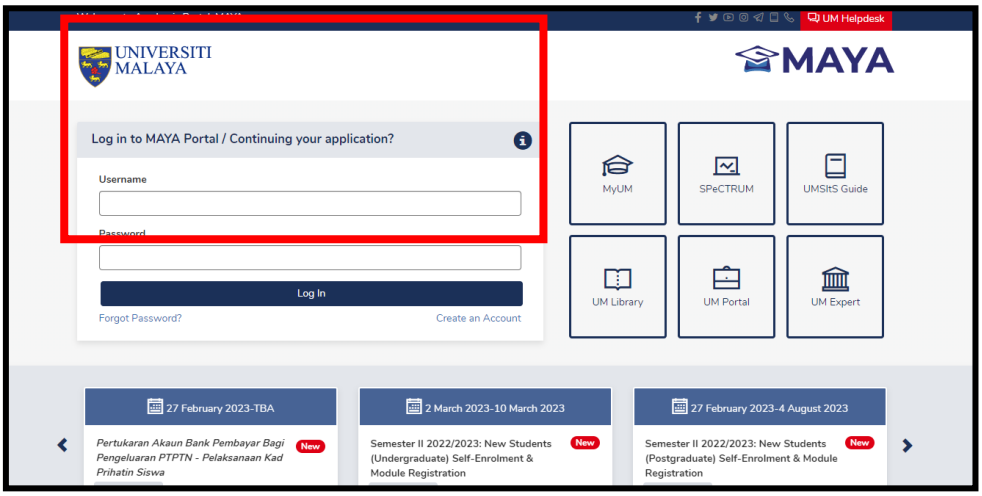
2) Providing guidance to the students in overcoming problems related to learning, if any, based on the students' academic performance.

3) Students who are underachieved or under probation are compulsory to meet the academic advisor.

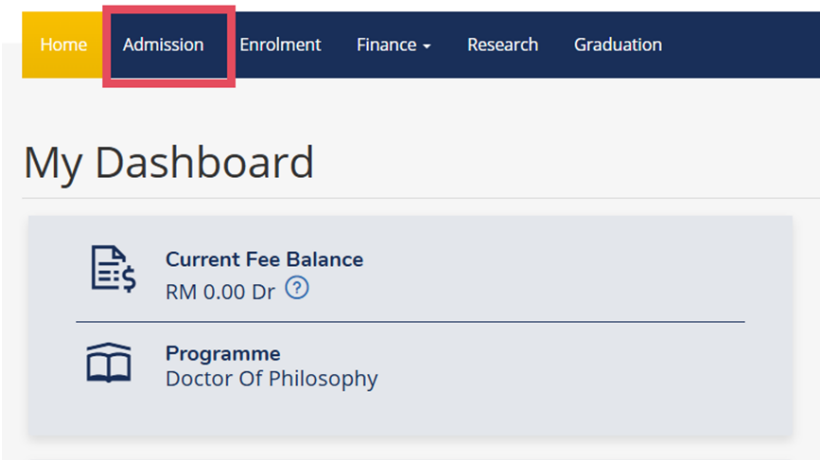
How to apply

HOW TO APPLY

(1) Go to Universiti Malaya's MAYA website (http://https://maya.um.edu.my/). Create new account or login using your email.



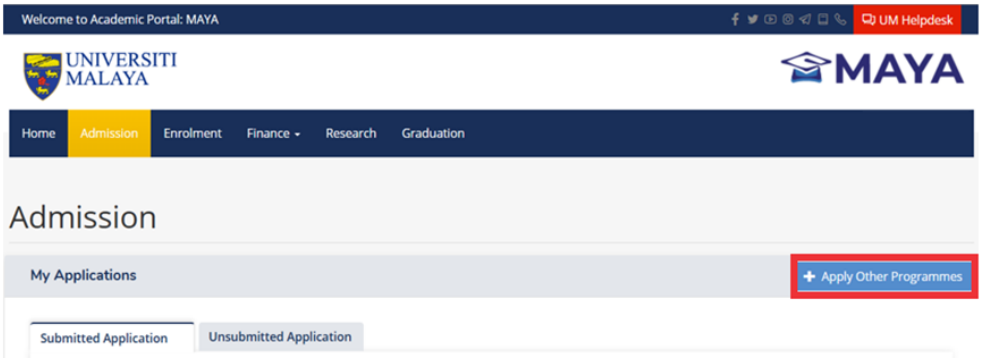
(2) After log in, select 'Admission' on the top.



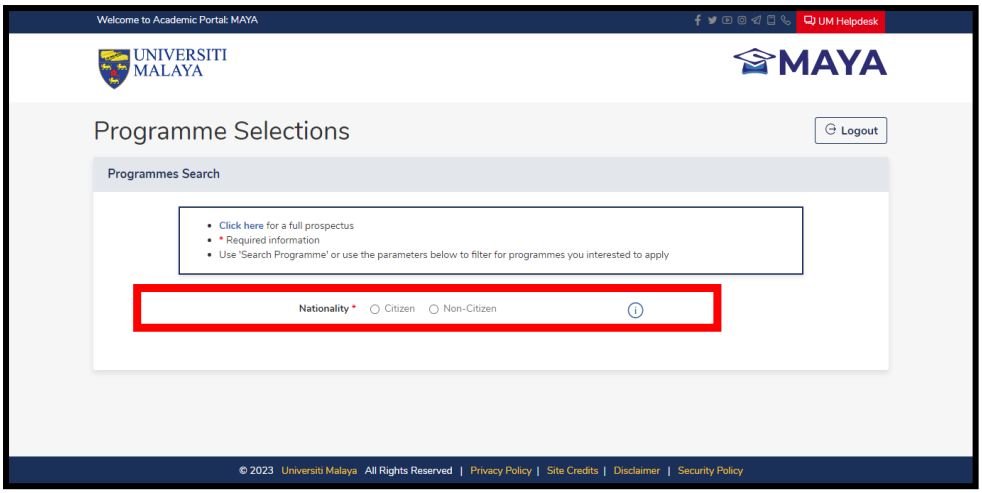
Note: In order to ensure your application run smoothly, please delete a previous application before proceed with a new application.

HOW TO APPLY

(3) Click 'Apply Other Programme' when in the Admission Page.



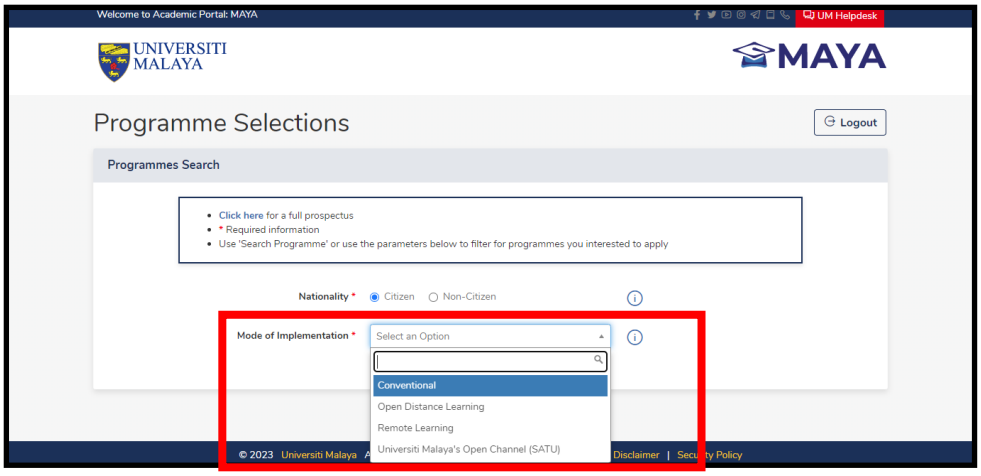
(4) At the Programme Selections page, select "Nationality".



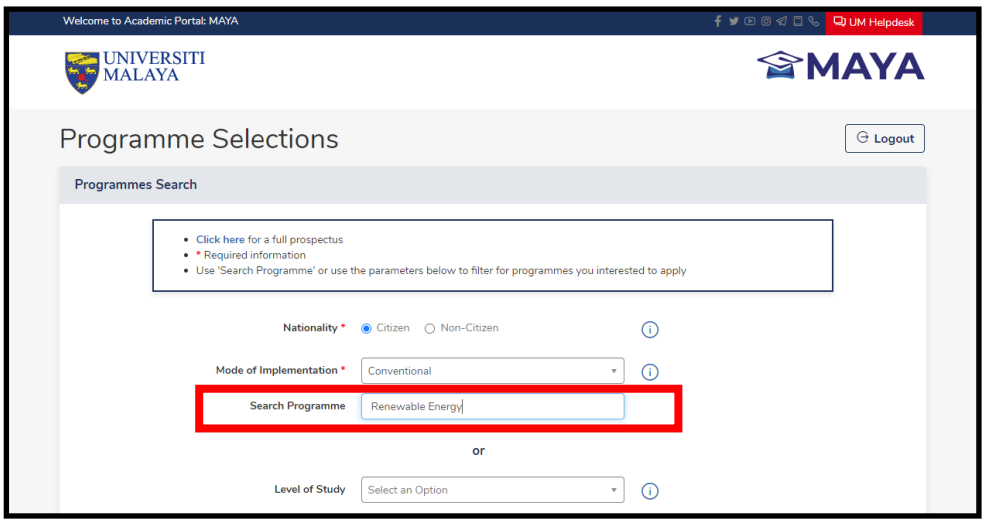
How to apply

HOW TO APPLY

(5) At the Mode of Implementation, select "Conventional".

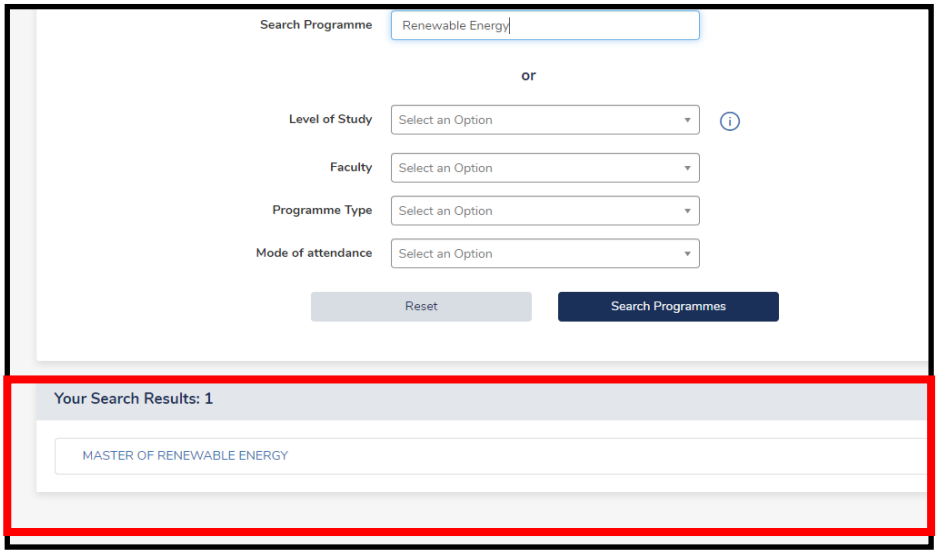


(6) Search the programme by typing the keyword such as "Renewable Energy"

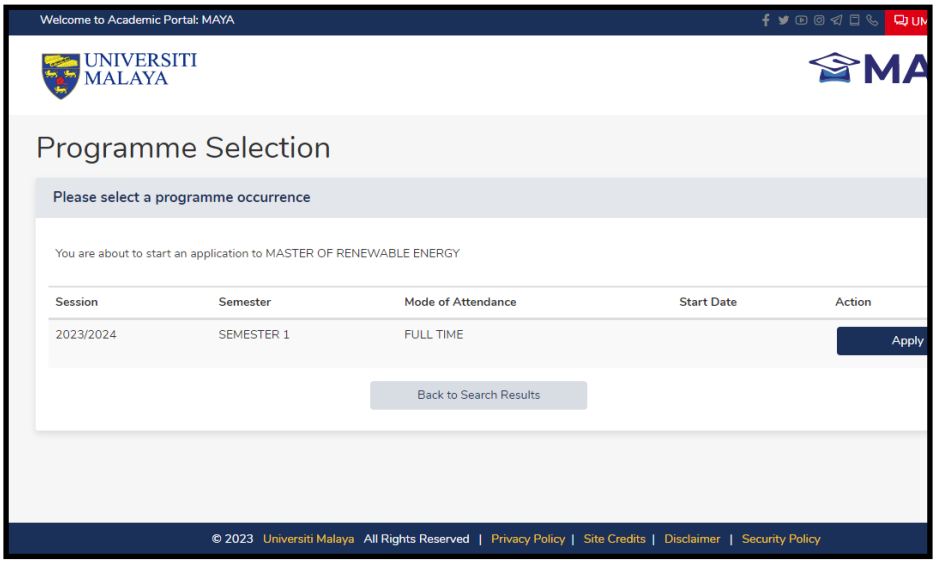


HOW TO APPLY

(7) Scroll down the page, you will find the search results and click on the link, "MASTER OF RENEWABLE ENERGY".



(8) At the Programme Selection Page, click on "Apply".



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UNIVERSITI MALAYA MAP

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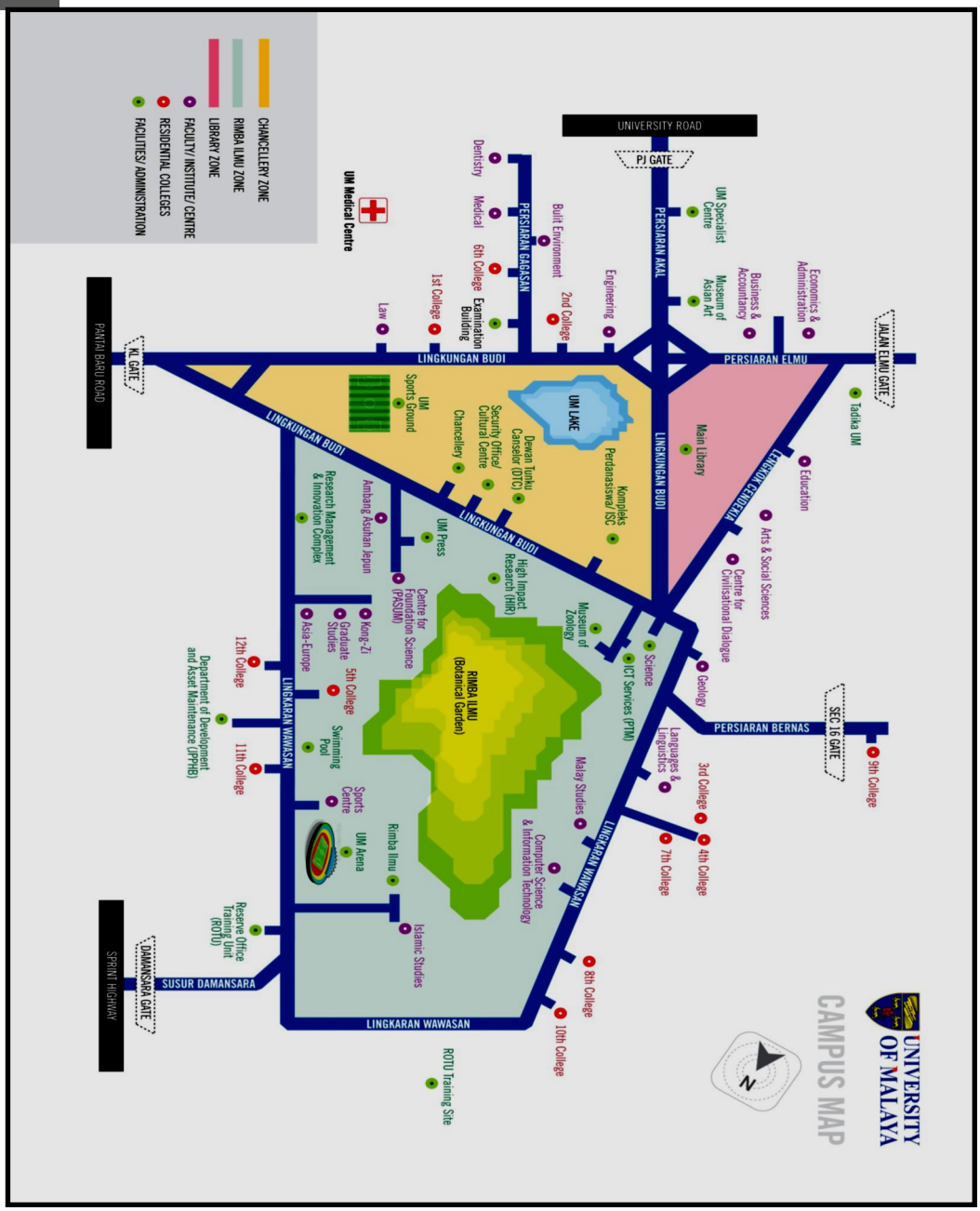
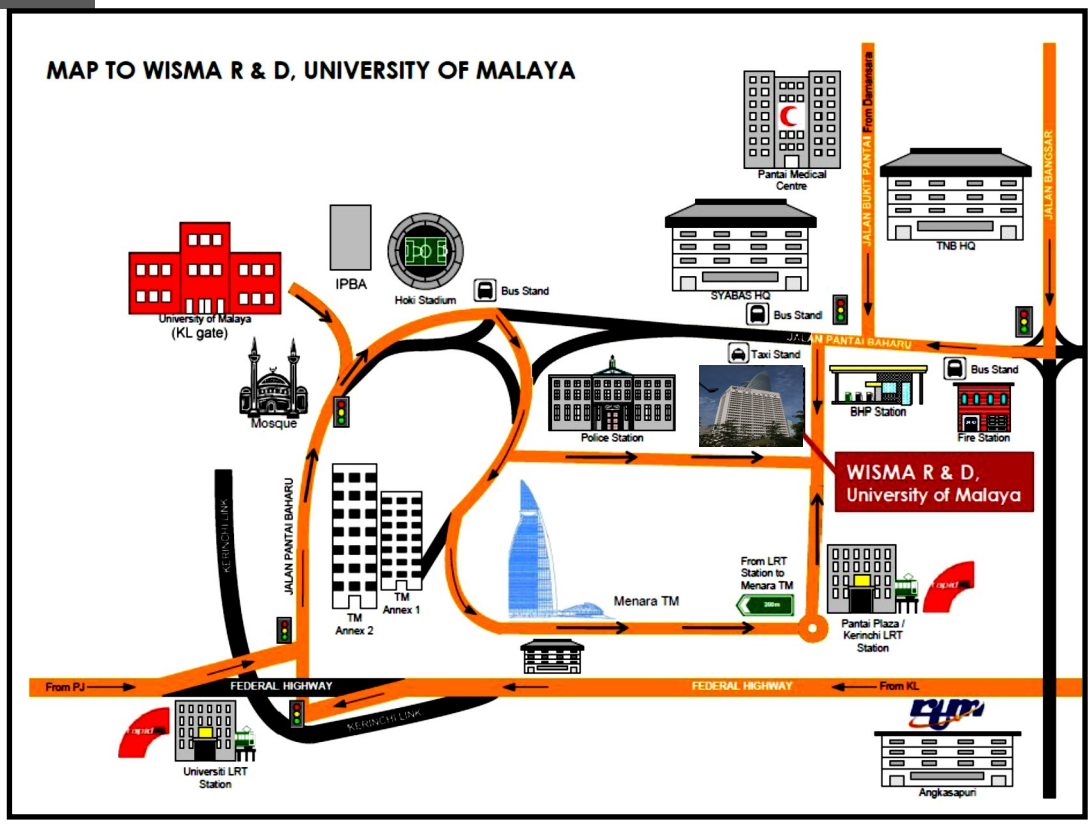


Contact Us

CONTACT US

UM POWER ENERGY DEDICATED ADVANCED CENTRE LOCATION



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Jalan Pantai Baharu, 59990 Kuala Lumpur
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+603 22463397 (Postgraduate Office)

Email: umpedac@um.edu.my
Website: www.umpedac.um.edu.my
Facebook: UMPEDAC
Instagram: UMPEDAC

GALLERY

Technical Visit at Wind Power Mechanical System Engineering Department of Jeju National University, KEPCO Experience Hall, and Smart Grid Test Bed, Jeju Global Research Centre, Institute of Energy Research on October 2014

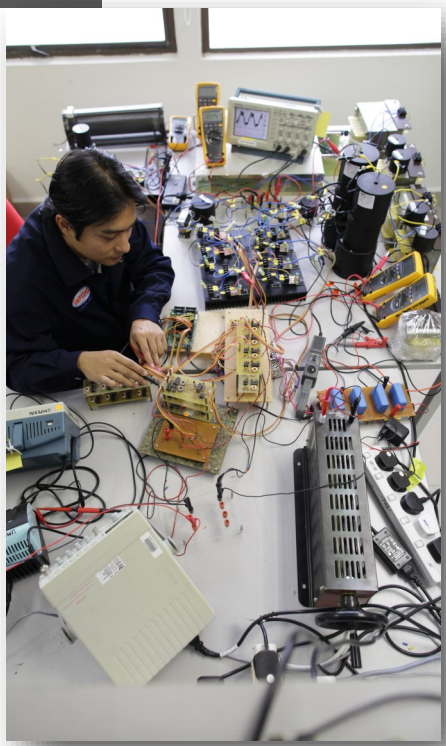
GALLERY

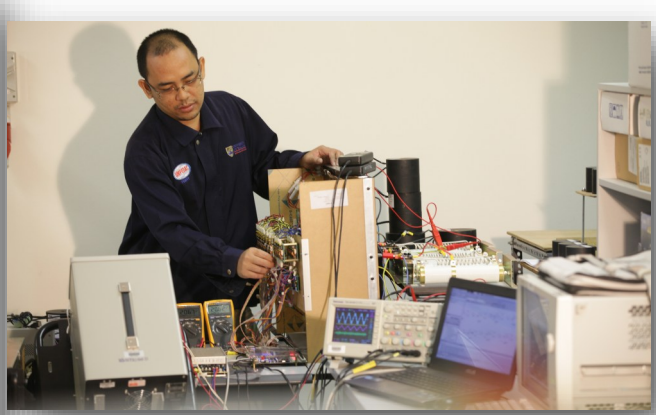
Technical Visit at Sun Edison Solar Farm at Sepang on April 2017

Technical Visit at Hydro Plant in Bentong, Pahang on November 2017

GALLERY

Exposed practical experience to the student in developing software programme and hardware development in power energy research works





Gallery

GALLERY

Organized variety of programs and activities for students

UNIVERSITI MALAYA

UMPEDAC

Institute for Advanced Studies (IAS)