



## ABOUT USM

Universiti Sains Malaysia (USM) is one of the three research-intensive universities in Malaysia. USM's mission and vision is to be a world-class university embarking on world class research programmes via strategic planning and implementation of its R&D mechanisms. Since its inception in 1969, USM has gained a reputation for providing excellent postgraduate programmes and is fast gaining international recognition, which is evident from the numerous international awards and prizes garnered by its researchers.

USM has three campuses; the Main Campus is located on the island of Penang while the Engineering Campus is located on the mainland side of the state of Penang. The third campus, which houses three health related programmes (Medicine, Health and Dentistry) is in the State of Kelantan--on the east coast of Peninsular Malaysia.

The students are enrolled in over 39 Schools and four Centres of Excellence in the areas of Medicine, Science and Technology, Engineering and Arts and are working towards their Masters or Doctorate degrees.

Graduate students work under the supervision of highly qualified academic staff whom are similarly active in their own well-funded research programmes, all within state-of-the-art research facilities.

**Institute of Postgraduate Studies**  
Transforming Higher Education  
for a Sustainable Tomorrow



## ABOUT IPS

The Institute of Graduate Studies was established on 16 November 1991 as a main vehicle to strategise, manage and monitor all matters pertaining to the graduate study programmes of the university, with specific focus on (i) increasing the number of postgraduate students, and (ii) ensuring quality postgraduate education

Specifically, the functions of the Institute is to

- implement the visions, missions and policies of the universities as determined by the University Management and Senate
- function as a secretariat to the Board of Graduate Studies
- administer all facets of postgraduate work from intake of students, their progress and also the evaluation of theses and examinations
- coordinate, organize and ensure uniformity in the implementation of various postgraduate courses and programmes

Source: <http://www.ips.usm.my>

Ensuring a Sustainable Tomorrow



## IAHR Student Chapter - USM

A group of 12 Universiti Sains Malaysia students from River Engineering and Urban Drainage Research Centre (REDAC), met at General Meeting of the International Association of Hydraulic Engineering and Research (IAHR) Student Chapter – Universiti Sains Malaysia (IAHR SC-USM) where the section officers were elected together with other six undergraduate and postgraduate members. On 21<sup>st</sup> September 2004, Prof. Roger Falconer, a council member of IAHR graciously launched the IAHR Student Chapter – USM, the first of its kind in the Far East during the official opening of 1<sup>st</sup> International Conference on Managing Rivers in the 21<sup>st</sup> Century: Issues and Challenges (Rivers'04).

IAHR SC-USM has six stated objectives and purposes:

1. To participate actively in activities organized by the IAHR
2. To encourage research network and international cooperation in Hydrology and Hydraulics
3. To collect and disseminate information of its disciplines
4. To involve in organizing and participating in lectures, exhibitions and conferences, seminars, courses as well as technical excursions
5. To promote stimulating profession and social opportunities for its members
6. To encourage the study of the science of Hydrology and Hydraulics and to improve the general and technical knowledge of its members

The section officers of the IAHR SC-USM are as follow:



**Advisor:**  
Prof. Aminuddin  
Ab. Ghani



**Chairman:**  
Leow Cheng  
Siang

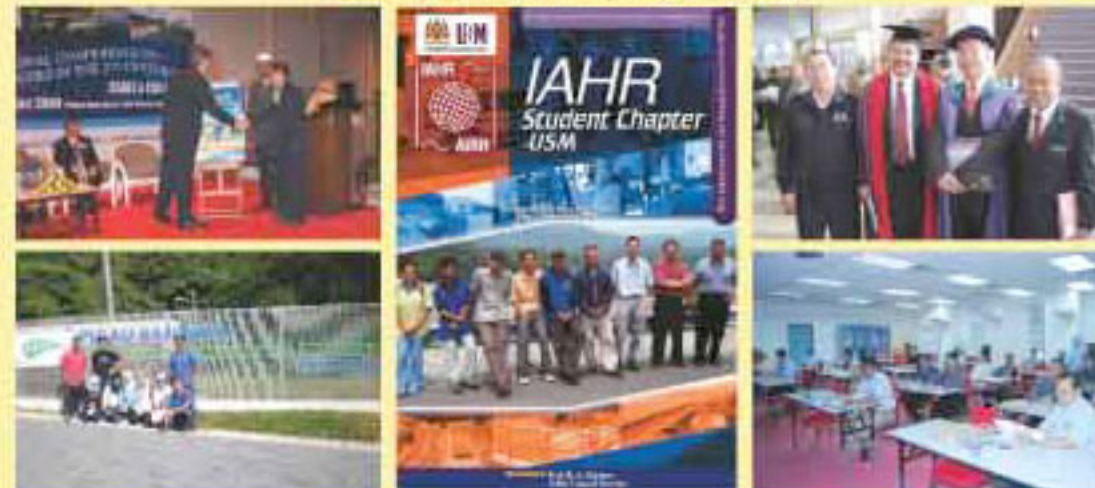


**Secretary:**  
Chang Chun Kiat



**Treasurer:**  
Mohd Fazly  
Yusof

Contact: [iahrscusm@eng.usm.my](mailto:iahrscusm@eng.usm.my)



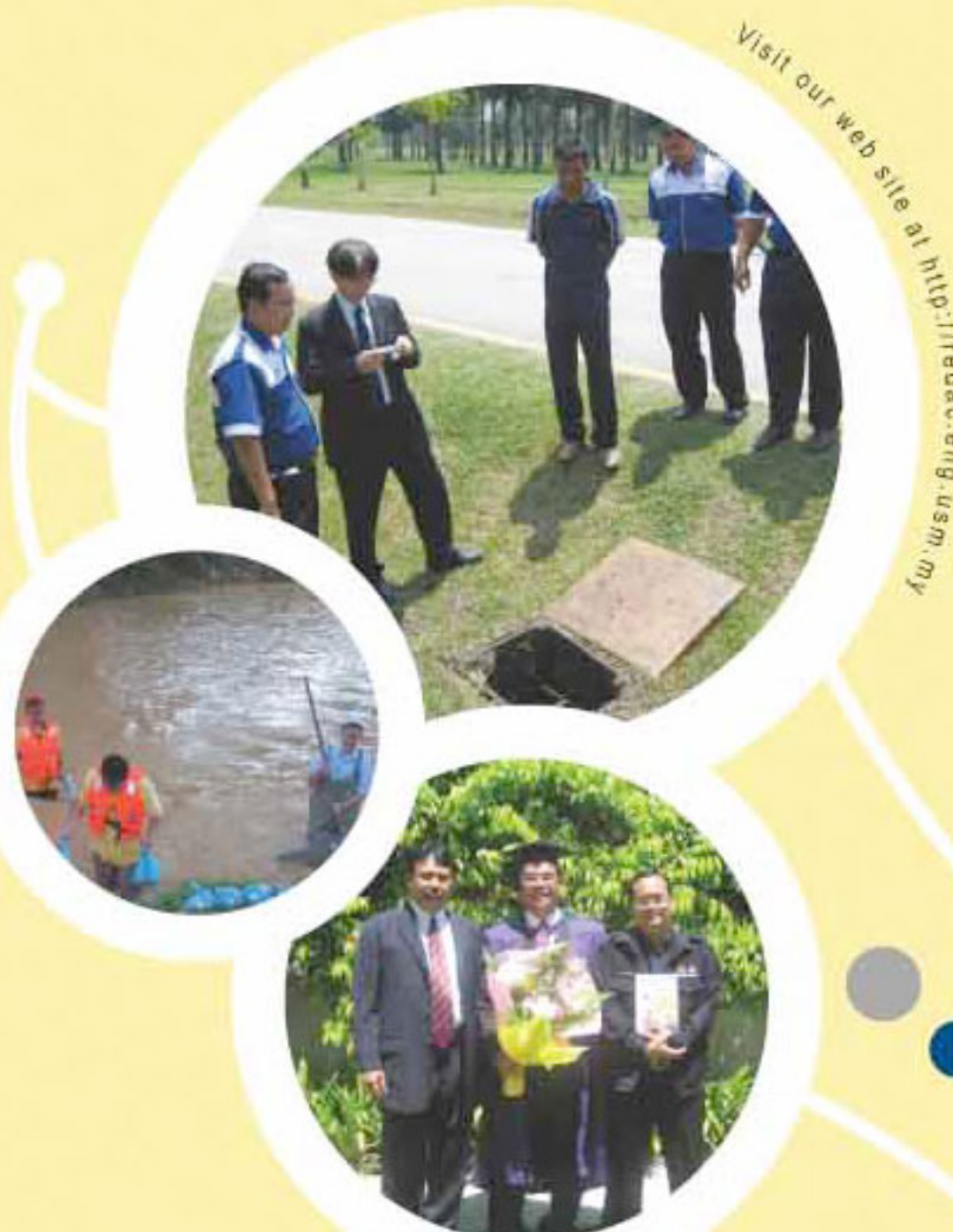
If you require further information, please contact REDAC at:

The Director  
River Engineering and Urban Drainage Research Centre (REDAC)  
USM Engineering Campus, Seri Ampangan  
14300 Nibong Tebal, Penang, MALAYSIA  
Tel: +604 5941035 Fax: +604 5941036 Email: [redac@eng.usm.my](mailto:redac@eng.usm.my)



# Postgraduate Programme

River Engineering and Urban Drainage Research Centre **REDAC**



Visit our web site at <http://redac.eng.usm.my>

USM Engineering Campus, Seri Ampangan  
14300 Nibong Tebal, Penang, Malaysia



## ABOUT REDAC

The River Engineering and Urban Drainage Research Centre (REDAC) was officially formed in 2001. The primary objectives of this centre are to:

- Develop a holistic continuous education programme in the area of river engineering and urban drainage management
- Become an internationally recognised centre for engineers and scientists to obtain the latest technology and knowledge in river engineering and urban drainage
- Promote REDAC as a Centre of Excellence focusing on environmentally friendly river engineering and urban drainage management
- Transform the quality of life in urban areas for future development with emphasis on the importance of sustainable development within the river basins

In order to achieve these objectives, the centre is extensively involved in various strategic activities, such as:

- Carrying out continuous R&D in the four main research areas
- Organising conferences, seminars and short courses
- Performing consultancy in related areas for the government and private sectors
- Developing technologies related to river engineering and urban drainage

The postgraduate programmes in REDAC are open to both local and international students who are qualified to pursue their graduate studies through mix mode (full time only) and also research mode.



River Hydraulic Data Collection



Water Quality Measurement



Velocity Measurement in Swale

## MIX-MODE PROGRAMME

### C26 Master of Science (Sustainable River Management)

This programme is intended for engineers from government sectors such as Department of Irrigation and Drainage, Department of Environment, Public Works Department and other local authorities. All students will be provided with updated knowledge and modules and research will be based on the real research carried out by REDAC. Thus, students will gain better knowledge in the real work condition by this continuously education technique.

The lecturers involved in teaching this course will be those from REDAC, the School of Civil Engineering, the School of Humanities and the School of Biological Sciences.

It is hoped that this programme will bring awareness to the general public and help us to preserve our rivers and improve our drainage systems which will give impact directly on our lives as Malaysia progresses into becoming a developed nation.

#### Course Structure

##### Core Subjects (16 units)

- Offered to develop specialization in sustainable river management by providing and conveying knowledge of related subjects in depth.

##### Elective Subjects (4 units)

- General subjects which supplement core subjects. These elective courses are offered to expand the knowledge of students in related fields other than the core specialization.

##### Research Project Dissertation (20 units)

- Aimed to enable students to carry out individual research in courses offered. Students will be asked to carry out site investigation, problem solving, writing and result presentation in the form of thesis report.

Course Code	Course Subject	Synopsis	Credit Hours
EAD 511	River Management	Open Channel Hydraulics, River Morphology, Sediment Transport, River Rehabilitation, IRBM	4
EAD 512	Urban Drainage Management	Flooding Impacts, Policies and Institutional Frameworks, Urban Hydrology, Ecological Approach, Non-Structural Flood Mitigation Strategies	4
EAD 513	Hydroinformatics	Urban Drainage and River Designs using Available Software	4
EAD 514	River Ecosystem	River ecosystem functions, Flora and fauna management, Wetland management	4
EAD 515	Hydraulic Structure	Dam outlet works, Energy Dissipator, Gates, Barrages, Cross Drainage, Pumping Stations	4
EAA 605	Dissertation	Research Projects	20

The course is offered on a full time basis in 2 semesters. The students are required to take 5 subjects during the first semester and complete a research project in the second semester. The student may choose to complete the course in 2 years. The course is offered through **School of Civil Engineering**.

## RESEARCH PROGRAMME

The River Engineering and Urban Drainage Research Centre (REDAC) offers a graduate programme encompassing several areas pertaining to River Management at the Master of Science or Doctor of Philosophy levels. These areas are River Management, Urban Drainage Management, Hydro informatics and Environmental Hydraulic Management. This programme is open to all Students of USM or other universities, local or international, who are qualified to pursue their graduate studies through research mode.

The subtopics for each area offered are described as follows:

#### • River Management (RED0101)

River Morphology, Sediment Transport, Stream Conservation & Restoration, Flood Plain Management, Stream Bank Control Using Bioengineering, Riparian Vegetation Management, Biological Impacts of River Canalization, River Modeling, Integrated River Basin Management.

#### • Urban Drainage Management (RED0102)

Runoff Quantity Control (Constructed Detention/Retention), Source Control BMPs, Treatment Control BMPs (Gross Pollutant Trap, Constructed Ponds & Wetlands), Subsoil Drainage, Storm Water Modeling, Stochastic Modeling, Integrated Storm Water Management, Bio-Ecological Drainage System (BIOECODS)

#### • Hydro informatics (RED0103)

Flood Risk Mapping Using GIS, Infiltration Mapping Using GIS, Integrated River Management Decision Support System.

#### • Environmental Hydraulics Management (RED0104)

Environmental Management Plan (EMP), Erosion Sediment Control Plan (ESCP), Surface Water Quality Modeling, Groundwater Quality Modeling.

## ADMISSION REQUIREMENTS

Applicants should possess one the following:

MSc

- A Bachelor's degree with Honours or equivalent.

PhD

- A Master's or Bachelor's (First Class Honours / CGPA >3.67) degree in related areas.

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