REGISTRATION FEES

- The Course fee of **RM 400/-** per person covers lecture notes, lunches and refreshments.
- All cheques should be made payable to :

BENDAHARI
UNIVERSITI TEKNOLOGI MALAYSIA

and mail to the Secretariat at the address overleaf.

ENQUIRIES

For more information please contact us at :

COASTAL & OFFSHORE ENGINEERING INSTITUTE
Universiti Teknologi Malaysia *International Campus*
54100 Jalan Semarak, Kuala Lumpur

☎ : 03-26154370/4381 🖷 : 03-26918109
✉ noraini@ic.utm.my / asyatie@ic.utm.my)

Note : The Organiser reserves the right to make changes where necessary to the programme herein.

REGISTRATION FORM *(Please print or use block letters)*

Short Course on
'INTRODUCTION TO SEDIMENT MOTION IN OPEN CHANNELS AND MORPHOLOGY'
4-5 MAY 2011

Name : (1) ..... E-mail : .....
(2) ..... E-mail : .....
(3) ..... E-mail : .....
Organisation : .....
Address : .....
Tel. No : ..... Fax No. : .....
Type of Payment : Cheque No..... amounting to RM 400/- as per registration fees is enclosed.
Date : ..... Signature : .....

The organisers reserve the right to make amendments or cancel the course in the event of unforeseen circumstances.

SHORT COURSE ON

INTRODUCTION TO SEDIMENT MOTION IN OPEN CHANNELS AND MORPHOLOGY

by
Professor Dr. Rangaswami Narayanan

4-5 May 2011

Venue :

Bilik Cempaka
Institut Pembangunan Bioproduk
UTM International Campus
Kuala Lumpur

Organised by :

UTM Universiti Teknologi Malaysia — Coastal and Offshore Engineering Institute (COEI) — RESEARCH UNIVERSITY

COASTAL & OFFSHORE ENGINEERING INSTITUTE
Universiti Teknologi Malaysia *International Campus*
Jalan Semarak, 54100 Kuala Lumpur

INTRODUCTION

Sediment motion is of interest to many disciplines such as civil engineering, geology and coastal engineers. This field has been actively researched literally over centuries. Many empirical equations have been derived essentially from laboratory experiments with uniform flows. With the advent of numerical techniques, the sediment transport and the morphology of rivers, reservoirs, coastal zones etc., are studied over short, medium and long terms.

This introductory course aims to give a simple treatment of motion of cohesionless sediments in uniform flows in open channels keeping derivations to a minimum. Some aspects of cohesive sediments will also be considered. This course will not deal exhaustively with empirical equations for sediment laden flow but to restrict to the ones that are popular. Most of the concepts will be supported by examples. It will also develop simple one-dimensional morphological model and discuss just briefly the more complicated models. It is hoped that this short course will give a good understanding of sediment motion in open channels and form the basis for further study of this challenging, at the same time fascinating subject of major importance to hydraulic engineers.

COURSE INSTRUCTOR

Dr. R Narayanan was formerly of the Department of Civil and Structural Engineerng, UMIST, now the University of Manchester, Manchester, U.K. Currently he is a Visiting Professor in the University of Kiel, Germany.

He has vast experience in the field of Hydraulic Engineering, and has supervised a number of Ph.D and M.Sc students. His research spans cavitation, sediment motion, hydraulic jump, forces on hydraulic structures and flow around subsea pipelines leading a number of publications in journals and international conference proceedings. He is a reviewer for a number of international journals of hydraulics/fluid mechanics, and was a peer reviewer for the grant awarding body EPSRC in U.K. He has given research seminars in the U.S.A, Canada, Turkey, Indian and Malaysia. He was a Visiting Research Associate Professor in Concordia University, Montreal, Canada and Visiting Professor in the Universiti Teknologi Malaysia, Johor Bahru and the Universiti Teknologi Petronas, Malaysia.

He has carried out considerable amount of consultancy work for the industry in the U.K. He is a member of the Editorial Board of the Malaysian Journal of Civil Engineering. He is a co-author of the book entitled " Hydraulic Structures" which is on its Fourth Edition.

COURSE PROGRAMME

SESSION 1 – Introduction
- Implications of sediment motion to engineering. The subject till 1980's and now.
- Steady Uniform flows in rigid open channels : bed shear stress, mean friction factor, Chezy's and Manning's equations

SESSION 2 – Turbulent flows in open channel
- Turbulent flows in rigid channels : mean velocity distributions, roughness, shear velocity
- Friction factor and Chezy's coefficient

SESSION 3 – Initiation of Sediment Motion
- Physical properties of sediments : cohesionless, cohesive
- Critical shear stress; horizontal and sloping channels, banks

SESSION 4 – Modes of sediment transport
- Bed and suspended loads including sediment transport equation
- Examples

SESSION 5 – Sediment transport capacity
- Total sediment load
- Examples

SESSION 6 – Bed forms and friction
- Friction in alluvial channels : two approaches
- Two approaches, examples

SESSION 7 – Morphological model for rivers
- One dimensional hydraulic equations
- Erosion equation

SESSION 8 – Morphological model
- Erosion equation for cohesive sediment
- Concluding remarks : Accuracy of computation, measurements and experience

REGISTRATION DETAILS

The closing date for application is **28 April 2011.** Photostat copies of registration forms are acceptable.

No refund of fees will be made but a replacement of participants is allowed.