MASTER OF SCIENCE (OFFSHORE TECHNOLOGY)

The Master of Science (Offshore Technology) is jointly hosted by the Department of Civil and Environmental Engineering and the Department of Mechanical Engineering, and is administered by the Department of Civil and Environmental Engineering.

It offers a comprehensive coverage of topics in Offshore Engineering, Subsea Engineering and Petroleum Engineering that are of great relevance to the offshore oil and gas industry which span the design of facilities in shallow waters to challenges that are faced by engineers in developments in deep waters and in arctic conditions, and technologies related to drilling, downhole measurements and characterization in the exploration and production of petroleum reservoirs.

A student can choose to graduate with ONLY one of the following:

1. **M.Sc. (Offshore Technology)**
   Students reading the programme without specialising in Subsea Engineering or Petroleum Engineering must successfully complete a programme with at least 40 MCs and achieve a minimum CAP of 3.00 which consist of:
   
   (a) at least 28 MCs (7 modules) from modules listed in part (i); &
   (b) the remaining up to 12 MCs (3 modules) from modules listed in part (iv) However, subject to prior approval from the Department’s Programme Management Committee, up to two (2) modules may be taken from outside the prescribed programme’s curriculum.

2. **M.Sc. (Offshore Technology) with Specialization in Subsea Engineering**
   To be eligible for the specialization, students must successfully complete a programme at least 40 MCs and achieve a minimum CAP of 3.00 which consists of details in the Programme Structure below.
   
   (a) at least 20 MCs (5 modules) from modules listed in part (ii); &
   (b) at least 28 MCs less the number of MCs taken in (a) from modules listed in part (i); &
   (c) the remaining up to 12 MCs (3 modules) from modules listed in part (iv). However, subject to prior approval from the Department’s Programme Management Committee, up to two (2) modules may be taken from outside the prescribed programme’s curriculum.

3. **M.Sc. (Offshore Technology) with Specialization in Petroleum Engineering**
   To be eligible for the specialization, students must successfully complete a programme at least 40 MCs and achieve a minimum CAP of 3.00 which consist of details in the Programme Structure below.
   
   (a) at least 20 MCs (5 modules) from modules listed in part (iii); &
   (b) at least 28 MCs less the number of MCs taken in (a) from modules listed in part (i); &
   (c) the remaining up to 12 MCs (3 modules) from modules listed in part (iv). However, subject to prior approval from the Department’s Programme Management Committee, up to two (2) modules may be taken from outside the prescribed programme’s curriculum.

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### Modules for M.Sc. (Offshore Technology) Programme

The programme’s modules are presented in the following three groups:

#### (i) Modules in Offshore Technology

- OT5001 Independent Study Module
- OT5101 Exploration and Production of Petroleum
- OT5102 Oil & Gas Technology
- OT5201 Marine Statics & Dynamics
- OT5202 Analysis & Design of Offshore Structure
- OT5203 Design of Floating Structures
- OT5204 Moorings & Risers
- OT5205 Offshore Pipelines
- OT5206 Offshore Foundations
- OT5207 Arctic Engineering
- OT5301 Subsea Systems Engineering
- OT5302 Subsea Control
- OT5304 Subsea Construction & Operations Support
- OT5305 Pressure Surges in Oil & Gas Flow Systems
- OT5401 Geoscience for Petroleum Exploration
- OT5402 Seismic Acquisition and Processing
- OT5403 Petrophysics and Downhole Measurements
- OT5404 Reservoir Characterization and Rock Physics
- OT5881 Topics in Offshore Technology Engineering
- OT5882 Topics in Subsea Engineering
- OT5883 Topics in Petroleum Engineering
- CE5307 Wave Hydrodynamics
- ME5301 Flow Systems Analysis
- ME5506 Corrosion of Materials
- ME5513 Fracture and Fatigue of Materials

#### (ii) Modules for Specialization in Subsea Engineering

- OT5102 Oil & Gas Technology (Compulsory)
- OT5301 Subsea Systems Engineering, [Compulsory unless the student has taken this module for his/her B.Eng. (Mechanical Engineering) programme]
- OT5205 Offshore Pipelines
- OT5302 Flow Assurance
- OT5303 Subsea Control
- OT5304 Subsea Construction & Operations Support
- OT5305 Pressure Surges in Oil & Gas Flow Systems (from term 1610)
- OT5882 Topics in Subsea Engineering
- OT5001A Independent Study Module: Subsea Engineering

#### (iii) Modules for Specialization in Petroleum Engineering

- OT5401 Geoscience for Petroleum Exploration
- OT5402 Seismic Acquisition and Processing
- OT5403 Petrophysics and Downhole Measurements
- OT5404 Reservoir Characterization and Rock Physics
- OT5405 Enhanced Oil Recovery
- OT5406 Petroleum Production Engineering
- OT5407 Petroleum Geomechanics
- OT5883 Topics in Petroleum Engineering
- OT5001B Independent Study Module: Petroleum Engineering

#### (iv) Elective modules

- CE4257 Linear Finite Element Analysis,
- CE4258 Structural Stability and Dynamics
- CE5105 Analytical & Numerical Methods in Foundation Engineering
- CE5308 Coastal Engineering and Sediment Transport
- CE5509 Advanced Structural Steel Design
- CE5603 Engineering Economics and Project Evaluation
- CE5702 CE Reliability Analysis & Design
- CE5804 Global Infrastructure Project Management
- CE6003 Numerical Methods in Engineering Mechanics
- CE6006 Advanced Finite Element Analysis
- CE6101 Geotechnical Constitutive Modelling
- ME5103 Plates and Shells (from AY2017/2018)
  *(Students who have read CE5514 Plate & Shells are not allowed to read ME5103)*
- ME5201 Thermal Systems Design
- ME5402 Advanced Robotics
- SH5204 Safety Engineering