ESE Master of Science in Environmental Engineering Curriculum
(Applicable only for students in intakes BEFORE August 2007)

Information is updated and correct as @ 17 October 2007. ESE has the right to amend the curriculum, if necessary.

Programme Structure

The Master of Science (M.Sc.) in Environmental Engineering is structured around lectures, continual assessments and end-of-semester examinations. Candidates may opt for part-time or full-time study.

Part-time students will normally read 2 graduate modules equivalent to 8 MCs per semester and attend lectures two evenings per week.

Full-time students will normally read 3 graduate modules equivalent to 12 MCs per semester and attend lectures three evenings per week.

A candidate needs to complete a program of study consisting of 2 core modules and at least 8 elective modules.

He/she may pursue the M.Sc. study with or without an area of specialization.

The specializations available are as follows:
1. Water
2. Air and Waste

Some modules have prerequisites. It is the candidate's responsibility to ensure that the prerequisite requirements are met. Likewise, if a specialization is opted, the candidate has to ensure that the requirements for this specialization are satisfied. Please refer to the requirements for each of the specializations as given below.

Candidates should also note that the final composition of graduate modules proposed by them is subject to approval by ESE. Candidates may, subject to approval, take up to 2 modules not exceeding 10 MCs that are below graduate level or from other departments.

The graduate requirements include obtaining a minimum Cumulative Average Point (CAP) of 3.0 (equivalent to an average of Grade of B-) for the best 40 Modular Credits (MCs), inclusive of core modules. Of the 40 MCs, all must be at graduate level and at least 30 MCs must be within the subject or in a related discipline, and the remaining credits may be from other disciplines as approved by the Department.

FOUNDATION MODULE

ESE 4001 Basic Environmental Science & Engineering* (previously ESE5001)

CORE MODULES

ESE 5002 Environmental Engineering 1 (Physical Principles)
ESE 5003 Environmental Engineering 2 (Chemical Principles)
OTHER MODULES

ESE5201 Combustion Pollution Control
ESE5202 Air Pollution Control Technology
ESE5203 Aerosol Science & Technology
ESE5204 Toxic & Hazardous Waste Management (previously ESE5101)
ESE5205 Sludge and Solid Waste Management (previously ESE5102)
ESE5301 Environmental Biological Principles
ESE5401 Water Quality Management
ESE5402 Industrial Wastewater Control
ESE5403 Water Reclamation & Reuse
ESE5404 Biological Treatment Processes
ESE5405 Water Treatment Processes
ESE5406 Membrane Treatment Process Modelling
ESE5601 Environmental Risk Assessment
ESE5602 Environmental Management Systems
ESE5603 Pollution Minimisation & Prevention
ESE5604 Process Engineering Design Principles
ESE5607 Green Catalysis
ESE5608 Heavy Metals in the Environment
ESE5901 Environmental Technology
ESE6301 Topics in Environmental Biotechnology
ESE6401 Advanced Biological Treatment Processes
ESE6402 Advanced Water Treatment Processes
ESE6403 Topics in Membrane Purification
ESE6404 Advanced Contaminant Transport

* This module is applicable to students deemed not to have sufficient background in Environmental Science & Engineering

Areas of Specialisation

1. **M.Sc. (Environmental Engineering) - Without Specialization**

   **A. To complete the following 2 CORE MODULES**

   ESE 5002 Environmental Engineering 1
   ESE 5003 Environmental Engineering 2

   **B. At least 6 modules from the following**

   ESE 5xxx Any ESE5000 level series graduate module
   ESE 6xxx Any ESE6000 level series graduate module
   GE 6211 Spatial Data Processing
   LX 5103 Environmental Law
   DE 5107 Environmental Planning
   SH 5101 Industrial Toxicology
   SH 5104 Occupational Health

   **C. Not more than 2 modules** (subject to approval) and not exceeding 10 MCs that are below graduate level or from other departments.
2. **M.Sc. (Environmental Engineering) - With Specialization in Water**

A. To complete the following 2 CORE MODULES

- ESE 5002 Environmental Engineering 1
- ESE 5003 Environmental Engineering 2

B. At least 4 modules from the following

- ESE 5401 Water Quality Management
- ESE 5402 Industrial Wastewater Control
- ESE 5403 Water Reclamation & Reuse
- ESE 5404 Biological Treatment Processes
- ESE 5405 Water Treatment Processes
- ESE 5406 Membrane Treatment Process Modeling
- ESE 6401 Advanced Biological Treatment Processes
- ESE 6402 Advanced Water Treatment Processes
- ESE 6403 Topics in Membrane Purification
- ESE 6404 Advanced Contaminant Transport

C. Not more than 4 modules from the pool of general electives given below

D. Not more than 2 modules (subject to approval) and not exceeding 10 MCs that are below graduate level or from other departments.

3. **M.Sc. (Environmental Engineering) - With Specialization in Air and Waste**

A. To complete the following 2 CORE MODULES

- ESE 5002 Environmental Engineering 1
- ESE 5003 Environmental Engineering 2

B. At least 4 modules from the following

- ESE 5201 Combustion Pollution Control
- ESE 5202 Air Pollution Control Technology
- ESE 5203 Aerosol Science and Technology
- ESE 5204 Toxic & Hazardous Waste Management
  *(previous code ESE5101)*
- ESE 5205 Sludge and Solid Waste Management
  *(previous code ESE5102)*
- GE 6211 Spatial Data Processing

C. Not more than 4 modules from the pool of general electives given below

D. Not more than 2 modules (subject to approval) and not exceeding 10 MCs that are below graduate level or from other departments.
**General Elective Modules**

ESE 5601  Environmental Risk Assessment  
ESE 5602  Environmental Management Systems  
ESE 5603  Pollution Minimization and Prevention  
ESE 5604  Process Engineering Design Principles  
ESE 5605  Environmental Biological Principles  
ESE 5606  Topics in Environmental Biotechnology  
ESE 5607  Green Catalysis  
ESE 5608  Heavy Metals in the Environment  
ESE 5901  Environmental Technology (under development)  
LX 5103  Environmental Law  
DE 5107  Environmental Planning  
SH 5101  Industrial Toxicology  
SH 5104  Occupational Health