

ESE Master of Science in Environmental Engineering Curriculum (Applicable for all students in intakes **August 2007 to January 2008**)

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 3 core modules and at least 7 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.

Candidates should also note that the final composition of graduate modules proposed by themselves is subject to approval by Division of Environmental Science & Engineering (ESE). Candidates may, as a part of the 10-module requirement for the MSc and subject to approval by ESE, take up to 2 modules not exceeding 10 MCs that are from other departments/faculties.

Modular Requirements

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 ESE 5001)

CORE MODULES

ESE 5002 Environmental Engineering 1 (Physical Principles)
ESE 5003 Environmental Engineering 2 (Chemical Principles)
ESE 5301 Environmental Biological Principles

OTHER MODULES

ESE5201	Combustion Pollution Control
ESE5202	Air Pollution Control Technology
ESE5203	Aerosol Science & Technology
ESE5204	Toxic & Hazardous Waste Management
ESE5205	Sludge and Solid Waste Management
ESE5401	Water Quality Management
ESE5402	Industrial Wastewater Control
ESE5403	Water Reclamation & Reuse
ESE5404	Biological Treatment Processes
ESE5405	Water Treatment Processes
ESE5406	Membrane Treatment Process Modeling
ESE5601	Environmental Risk Assessment
ESE5602	Environmental Management Systems
ESE5603	Pollution Minimization & 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. \(Environmental Engineering\) - General](#)

A. To complete the following 3 CORE MODULES

ESE5002	Environmental Engineering 1
ESE5003	Environmental Engineering 2
ESE5301	Environmental Biological Principles

B. At least 5 modules from the following

ESE5XXX	Any ESE5000 level series graduate module
ESE6XXX	Any ESE6000 level series graduate module
GE6211	Spatial Data Processing
LX5103	Environmental Law
DE5107	Environmental Planning
SH5101	Industrial Toxicology
SH5104	Occupational Health

C. At least 2 additional modules, for a total of 10 modules for the MSc.

D. Note that all 10 required modules can be from ESE but a maximum of 2 modules of the 10 required modules may be from other Departments/Faculties (subject to approval of ESE)

2. M.Sc. (Environmental Engineering) – with Specialisation in Water

A. To complete the following 3 CORE MODULES

ESE5002	Environmental Engineering 1
ESE5003	Environmental Engineering 2
ESE5301	Environmental Biological Principles

B. At least 4 modules from the following

ESE5401	Water Quality Management
ESE5402	Industrial Wastewater Control
ESE5403	Water Reclamation & Reuse
ESE5404	Biological Treatment Processes
ESE5405	Water Treatment Processes
ESE5406	Membrane Treatment Process Modeling
ESE6401	Advanced Biological Treatment Processes
ESE6402	Advanced Water Treatment Processes
ESE6403	Topics in Membrane Purification
ESE6404	Advanced Contaminant Transport

C. At least 3 additional modules, for a total of 10 modules for the MSc.

D. Note that all 10 required modules can be from ESE but a maximum of 2 modules of the 10 required modules may be from other Departments/Faculties (subject to approval of ESE)

3. M.Sc. (Environmental Engineering) – with Specialisation in Air and Waste

A. To complete the following 3 CORE MODULES

ESE5002	Environmental Engineering 1
ESE5003	Environmental Engineering 2
ESE5301	Environmental Biological Principles

B. At least 4 modules from the following

ESE5201	Combustion Pollution Control
ESE5202	Air Pollution Control Technology
ESE5203	Aerosol Science & Technology
ESE5204	Toxic & Hazardous Waste Management
ESE5205	Sludge & Solid Waste Management
GE6211	Spatial Data Processing

C. At least 3 additional modules, for a total of 10 modules for the MSc.

D. Note that all 10 required modules can be from ESE but a maximum of 2 modules of the 10 required modules may be from other Departments/Faculties (subject to approval of ESE)

General Elective Modules

ESE5601	Environmental Risk Assessment
ESE5602	Environmental Management Systems
ESE5603	Pollution Minimization and Prevention
ESE5604	Process Engineering Design Principles
ESE5607	Green Catalysis
ESE5608	Heavy Metals in the Environment
ESE5901	Environmental Technology
ESE6301	Topics in Environmental Biotechnology
DE5107	Environmental Planning
LX5103	Environmental Law
PP5227	Environmental Policy and Natural Resource Management
SH5101	Industrial Toxicology
SH5104	Occupational Health

Note: All modules listed are of 4 MCs each.