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

<table>
<thead>
<tr>
<th>Course Code</th>
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<tbody>
<tr>
<td>ESE5002</td>
<td>Environmental Engineering 1</td>
</tr>
<tr>
<td>ESE5003</td>
<td>Environmental Engineering 2</td>
</tr>
<tr>
<td>ESE5301</td>
<td>Environmental Biological Principles</td>
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</tbody>
</table>

B. At least 4 modules from the following

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</tr>
</tbody>
</table>

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

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B. At least 4 modules from the following

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<td>GE6211</td>
<td>Spatial Data Processing</td>
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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.