

MASTER OF SCIENCE (CIVIL ENGINEERING)

For Cohorts Prior to AY2022/2023

The Master of Science (Civil Engineering) program, or MSc (CE), is hosted by the Department of Civil & Environmental Engineering. To qualify for the MSc (CE) degree with or without specialization, a candidate must successfully complete a program of study consisting of at least 40 Modular Credits (MCs). At least 30 MCs must be taken from 5000 and 6000 Level modules. In addition, a student must obtain a minimum Cumulative Average Point (CAP) of 3.00 (equivalent to an average of grade of B-) for the best modules equivalent to 40 MCs (inclusive of compulsory modules, where required).

A student may choose to graduate with the following degrees:

- MSc (Civil Engineering)
- MSc (Civil Engineering) with specialization in Structural Engineering
- MSc (Civil Engineering) with specialization in Geotechnical Engineering
- MSc (Civil Engineering) with specialization in Infrastructure Project Management
- MSc (Civil Engineering) with specialization in Transportation Engineering
- MSc (Civil Engineering) with specialization in Hydraulic Engineering & Water Resources Management

Students who wish to graduate with a specialization, they must also meet the requirements for that specialization stipulated below.

1. Specialization in Structural Engineering

Candidates who wish to obtain the MSc (CE) with specialization in Structural Engineering must pass 20 MCs of the following distinct modules, each with a grade point of at least 2.0 (Grade C):

Module Code & Title	MCs	Module Code & Title – Equivalent Revised Module	MCs
CE5509 Advanced Structural Steel Design	4	CE5509QA Advanced Structural Steel Design to EC3, and CE5509QB Design of Composite Steel and Concrete Structures to EC4	2 2
CE5510 Advanced Structural Concrete Design	4	CE5510QA Structural Concrete Design to EC2 CE5510QB Advanced Structural Concrete Design to EC2	2 2
CE5513 Plastic analysis of structures			4
CE5604 Advanced Concrete Technology			4
CE5610 Assessment and Retrofit of Concrete Structures	4	CE5610QA Concrete and Cementitious Composites CE5610QB Repair and Retrofit of Concrete Structures	2 2
CE5611 Precast Concrete Technology	4	CE5611QA Specifying Concrete to EN 206 CE5611QB Precast Concrete Design	2 2
CE6006 Advanced Finite Element Analysis			4
CE6705 Analysis and Design of Buildings against Hazards			4
ME5103 Plates and Shells (from AY2017/2018) <i>(Students who have read CE5514 Plate & Shells are not allowed to read ME5103)</i>			4

Should a student wish, with valid reasons, to replace any of the above modules by another appropriate module, approval must be sought from the Head, Department of Civil & Environmental Engineering or his nominee.

The remaining 20 MCs to satisfy the degree requirements may be selected from Level 5000 and 6000 modules offered by the Department of Civil & Environmental Engineering, which also include the above-mentioned modules.

Specialization in Geotechnical Engineering

Candidates who wish to obtain the MSc (CE) with specialization in Geotechnical Engineering must pass 20 MCs of the following distinct modules, each with a grade point of at least 2.0 (Grade C):

Module Code & Title	MCs	Module Code & Title – Equivalent Revised Module	MCs
CE5101 Seepage and Consolidation of Soils			4
CE5104 Underground Space	4	CE5104QA Tunneling in Soils CE5104QB Tunneling in Rocks	2 2
CE5106 Ground Improvement	4	CE5106QA Ground Improvement – Hydraulic, Vibratory & Chemical CE5106QB Ground Improvement – Dynamic, Geosynthetic & Inclusions	2 2
CE5107 Pile Foundation	4	CE5107QA Pile Foundation Design CE5107QB Advanced Topics in Pile Foundation Design	2 2
CE5108 Earth Retaining Structures	4	CE5108QA Key Principles and Concepts of Earth Retention Systems CE5108QB Deep Excavations Analysis and Modelling	2 2

Should a student wish, with valid reasons, to replace any of the above modules by another appropriate module, approval must be sought from the Head, Department of Civil & Environmental Engineering or his nominee.

The remaining 20 MCs to satisfy the degree requirements may be selected from level 5000 and 6000 modules offered by the Department of Civil & Environmental Engineering, which also include the above-mentioned modules.

2. Specialization in Infrastructure Project Management

For this specialization, students must pass at least 20 MCs of the following distinct modules, each with a grade point of at least 2.0 (Grade C):

Module Code & Title	MCs	Module Code & Title – Equivalent Revised Module	MCs
CE5001 Research Project (Compulsory)			8
CE5805 DfMA & Productivity Analytics in Construction	4	CE5805QA Design for Manufacturing & Assembly CE5805QB Construction Productivity Analytics	2 2
CE5806 Advanced Project Management with Lean Construction	4	CE5806QA Advanced Project Management CE5806QB Lean Construction	2 2
CE5807 Integrated Digital Delivery (IDD)	4	CE5807QA Digital Technologies for Construction CE5807QB Integrated Construction Logistics	2 2
CE5808 Digital Design and Construction (BIM and VDC)	4	CE5808QA Virtual Design in BIM CE5808QB Advanced Digital Construction	2 2
CE5809 Management and Economics of International Construction			4

Should a student wish, with valid reasons, to replace any of the above modules by another appropriate module, approval must be sought from the Head, Department of Civil & Environmental Engineering or his nominee.

In addition, he/she must complete at least 12 MCs of the following elective modules:

Module Code & Title	MCs	Module Code & Title – Equivalent Revised Module	MCs
CE5208 Transport Infrastructure Asset Management			4
CE5604 Advanced Concrete Technology			4
CE5610 Assessment and Retrofit of Concrete Structures	4	CE5610QA Concrete and Cementitious Composites CE5610QB Repair and Retrofit of Concrete Structures	2 2
CE5611 Precast Concrete Technology	4	CE5611QA Specifying Concrete to EN 206 CE5611QB Precast Concrete Design	2 2
CE5880 Topics in Project Management Engineering			4
CE6001 Operations and Management of Infrastructure Systems			4
PM5103 Contract Management			4
PM5109 Project Management Law			4
IE5404 Large Scale Systems Engineering			4
SH5201 Hazard Identification and Evaluation Techniques			4
SH5401 SHE and Quality Management Systems			4

The remaining 8 MCs to satisfy the degree requirements may be selected from Level 5000 and 6000 modules offered by the Department of Civil & Environmental Engineering, which also include the above mentioned modules.

Should a student drop out of this specialization but has taken more than 10 MCs of cross-faculty/department elective modules, only up to 10 MCs of such modules can be counted towards his/her graduation requirements.

3. Specialization in Transportation Engineering

For this specialization, students must pass at least 20 MCs of the following distinct modules, each with a grade point of at least 2.0 (Grade C):

- CE4221 Design of Land Transport Infrastructures
- CE5203 Traffic Flow and Control
- CE5204 Pavement Design and Rehabilitation
- CE5205 Transportation Planning
- CE5206 Urban Public Transportation Systems
- CE5208 Transport Infrastructure Asset Management
- CE5209 Transportation Data Analytics and Modeling
- TP5025 Intelligent Transportation Systems
- TP5026 Transport Management and Policy
- TP5028 Intermodal Transport Operations

The remaining 20 MCs to satisfy the degree requirements may be selected from level 5000 and 6000 modules offered by the Department of Civil & Environmental Engineering, which also include the above-mentioned modules.

Note: CE4221 is counted towards the allowable 10 MCs of cross-faculty/department elective modules.

4. Specialization in Hydraulic Engineering & Water Resources Management (HEWRM)

Candidates who wish to obtain the HEWRM specialization must pass 20 MCs of the following distinct modules, each with a grade point of at least 2.0 (Grade C).

CE5308	Coastal Processes and Sediment Transport (4MCs)
CE5310	Hydroinformatics (4 MCs)
CE5312	Open Channel Hydraulics (4 MCs)
CE5315	Climate Science for Engineers (4 MCs)
CE5316A	Water Resources for Smart and Liveable Cities: Introduction (2 MCs)
CE5316B*	Water Resources Modelling for Urban Catchments (2 MCs)
CE5316C*	Eco-hydrology (2 MCs)
CE6077A	Numerical Methods in Civil Engineering (2 MCs)
CE6077B	Numerical Methods for Environmental Flows (2 MCs)

** only 2 MCs to be counted toward specialisation requirement*

The remaining 20 MCs to satisfy the degree requirements may be selected from level 5000 and 6000 modules offered by the Department of Civil & Environmental Engineering, which also include the above-mentioned modules.

In the event that any student has valid reasons not to take some of the above modules, the CE5314 HEWRM Project (8 MCs) may be used to fulfil the 20 MCs specialization requirement.