1.2.1 Degree programmes and requirements

M.Sc. (Maritime Studies)

The classes are normally conducted in the evenings or weekends and selected concentrated periods during the office hours.

Candidates are expected to hold a degree (or equivalent maritime professional qualifications) with two to three years of working experience in shipping and related businesses.

M.Sc. (International Construction Management)

For successful completion of the programme of study, students must obtain a total of 30AUs, of which 18 AUs must be in International Construction Management. The remaining 12AUs can be selected from the programme or an approved list of graduate programmes offered by the School of Civil and Environmental Engineering or any other graduate programmes approved by the Dean.

The programme has two intakes, January and August, each year. The courses, 3AUs each, are:

- CV6212 Construction Management
- CV6213 Construction Technology
- CV6214 Project Financing
- CV6215 International Construction and Marketing
- CV6216 Techniques of Project Planning and Control
- CV6217 Information Technology in Construction
- CV6218 Value Engineering and Managing Quality
- CV6220 Construction Law
- CV6221 Advanced Construction Law and Dispute Resolution in the Construction Industry

A candidate who has obtained the Graduate Diploma in Construction Management not earlier than 48 months prior to admission is exempted from certain courses as may be determined by the School of Civil and Environmental Engineering with the approval of the Board of Graduate Studies.

M.Sc. (Environmental Engineering)

To be awarded the degree of M.Sc. (Environmental Engineering), a candidate must complete satisfactorily ten courses. Six of the courses must be in Environmental Engineering. The remaining courses can be selected from a list of graduate courses approved by the School of Civil and Environmental Engineering.

The programme may be taken either on full-time or part-time basis. For full-time students, the minimum and maximum periods of candidature are one year and three years respectively. For part-time students, the minimum and maximum periods of candidature are two years and four years respectively.

Courses of study

The Environmental Engineering courses to be offered by the School in a particular semester will be selected from the following list, (which may change over time):

- CV6501 Water Treatment and Process Design
- CV6502 Contaminated Site Assessment and Remediation
- CV6503 Wastewater Treatment and Process Design
- CV6504 Hazardous Waste Treatment and Recovery
- CV6505 Water Quality Modelling
- CV6511 Industrial Waste Management
- CV6512 Integrated Solid Waste Management
- CV6521 Air Quality Management
- CV6531 Environmental Biotechnology
- CV6532 Environmental Management Systems
- CV6533 Environmental Chemistry
- CV6591 Stream Corridors and Channel Processes

• CV6601 Contaminant Transport
• CV6602 Urban Hydrology
• CV6551 Special Topics in Environmental Engineering

Note: Curriculum is subject to changes.

M.Sc. (Civil Engineering)

Curriculum structure

The course of study, with intakes in August and January each year, comprises 30 AUs of courses. In addition to taking Civil Engineering courses, candidates may also take courses from areas outside civil engineering with approval from the Chair of the School of Civil and Environmental Engineering.

The Chair of the School of Civil and Environmental Engineering may, based on previous academic records of a candidate, recommend exemptions and transfer of credits to be counted towards the total AUs required to obtain the M.Sc. degree.

For each course, the students will normally meet once a week for 3 hours of lecture. Full-time students may register for up to 15AUs of courses while part-time students may register for up to 9AUs of courses per semester. A full-time student may complete the programme in approximately 2 semesters or 12 months, while a part-time student will be able to complete the M.Sc. programme in 4 semesters or 24 months.

Candidates can opt to follow a concentrated focus of study in one of the four specialisation areas in addition to the general Civil Engineering curriculum. The four specialisation areas are:

(1) Geotechnical Engineering
(2) Transportation Engineering
(3) Structural Engineering
(4) Protective Technology

(1) Geotechnical Engineering Specialisation
* (To be qualified for specialisation in Geotechnical Engineering, a student must take CV6311 plus any other four courses listed below.)

Courses of study

- CV6311* Soil Behaviour and Engineering Properties
- CV6312 Slope Stability and Ground Improvement
- CV6313 Shallow and Deep Foundations
- CV6314 Excavation and Earth Retaining Systems
- CV6315 Engineering Geology and Rock Mechanics
- CV6107 Behaviour and Design of Steel and Composite Structures

(2) Transportation Engineering Specialisation
* (To be qualified for specialisation in Transportation Engineering, a student must take CV6422 plus any other four courses listed below.)

Courses of study

- CV6422* Statistical Methods for Transportation Analysis
- CV6423 Operations Research Methods in Transportation
- CV6431 Airport System and Planning
- CV6441 Pavement Engineering and Management
- CV6442 Advanced Traffic Engineering
- CV6443 Traffic Impact and Safety Studies
- CV6481 Urban and Regional Transport Planning

(3) Structural Engineering Specialisation
* (To be qualified for specialisation in Structural Engineering, a student must take at least five courses from the list below)

Courses of study

- CV6001 Finite Element Methods
- CV6002 Advanced Strength of Materials
- CV6103 Structural Dynamics
- CV6104 Behaviour and Design of Reinforced Concrete Members
- CV6105 Seismic Design of RC Structures
- CV6106 Precast and Prestressed Concrete Structures
- CV6107 Behaviour and Design of Steel and Composite Structures
- CV6108 Analysis and Design of Tall Buildings
- CV6109 Advanced Concrete Technology
- CV6313 Shallow and Deep Foundations

(4) Protective Technology Specialisation
* (To be qualified for specialisation in Protective Technology, a student must take CV6161, CV6162 and CV6163 plus two courses listed below)

Courses of study

- CV6001 Finite Element Methods
- CV6002 Advanced Strength of Materials
- CV6103 Structural Dynamics
- V6104 Behaviour and Design of Reinforced Concrete Structures
- CV6161* Introduction of Explosives and Blast Loading
- CV6162* Structural Response to Blast Loading
- CV6163* Design of Structures to Resist the Effect of Explosions
- CV6120 Fire Engineering Design of Structures

Not all courses on the approved list will be offered in any academic year. The courses offered in any academic year shall be determined by the School of Civil and Environmental Engineering.

M.Sc. (Environmental Science and Engineering)

The Singapore Stanford Partnership is a joint effort between NTU's School of Civil and Environmental Engineering and Stanford's Department of Civil and Environmental Engineering to establish a Singapore-based premier graduate education and research programme in Environmental Engineering.

The M.Sc. programme requires one year with the first quarter in residence at Stanford. It aims to produce high calibre environmental engineers equipped with both fundamental understanding and practical skills. Students will take courses taught jointly by NTU and Stanford faculty. While at NTU, students will also take regular Stanford courses taught by visiting Stanford faculty or through the use of on-line, interactive transmission of lectures.

The M.Sc. programme requires four consecutive quarters (12 months) and includes coursework and a project for a total of 48 credits.

Students begin the programme by spending the summer (June to September) academic quarter at Stanford. Students return to NTU where they attend classes taught either
• jointly by NTU faculty and visiting Stanford professors or
• by using on-line, interactive IT tools for live transmission of regular Stanford classes and interaction with Stanford faculty

The project spanning the last second quarters, has an industry or research focus. The M.Sc. intake is in June with an application deadline of November 30.

Graduate Diploma in Airport Engineering

This is a programme of 11 weeks duration (9:00 am to 4:30 pm, Mondays to Fridays) which will commence in July and admits only full-time students. The programme comprises three modules:
• Module I CV6201 Airport System and Planning

• Module II CV6202 Airport Design and Construction
• Module III CV6203 Airport Maintenance

A candidate may attend one or more courses of the programme in any given year. The student is required to attend course I in his first year of study. Each course will have two examination papers which will be given at the end of that module. Successful completion of the programme requires the candidate to pass the examination in each of the three courses. A candidate who fails in any course may be permitted to take the examination for that course again once only at the next period of the examination for that course, provided that this is done within the maximum period of his candidature.

The minimum period of candidature is 11 weeks. The maximum period is 24 months. Candidates who have satisfactorily completed the programme and awarded the Graduate Diploma in Airport Engineering may apply for admission to the M.Sc. (Civil Engineering) programme. Such applications will be considered in the light of the candidates' performance in the three courses of the Graduate Diploma in Airport Engineering programme.

Graduate Diploma in Construction Management

The Graduate Diploma in Construction Management programme is conducted jointly by the Nanyang Technological University (NTU), the Building and Construction Authority of Singapore and the Institution of Engineers, Singapore.

The programme has two intakes, January and July, each year. For successful completion of the programme, candidates must obtain a total of 15 AUs. Candidates may choose any courses offered under the Master of Science (International Construction Management) programme. The courses, 3 AUs each, are:

CV6212 Construction Management
CV6213 Construction Technology
CV6214 Project Financing
CV6215 International Construction and Marketing
CV6216 Techniques of Project Planning and Control
CV6217 Information Technology in Construction
CV6218 Value Engineering and Managing Quality
CV6220 Construction Law
CV6221 Advanced Construction Law and Dispute Resolution in the Construction Industry