3.4.2 Bachelor of Technology (Civil Engineering)

The BTech (Civil Engineering) programme is offered in partnership with the Department of Civil and Environmental Engineering beginning in August 2017. The curriculum for the part-time BTech Programme is formulated based on the current broad based full-time B.Eng. programme but with stronger emphasis on practice.

As this is a new programme, we are seeking accreditation from the Engineering Accreditation Board (EAB) of the Institution of Engineers Singapore (IES). We expect to be provisionally accredited for the first 2 years after the launch of the programme and full accreditation will be expected in about 3 years thereafter. With successful accreditation, all signatories in the Washington Accord will recognise the substantial equivalence of this programme in satisfying the academic requirements for the practice of engineering at the professional level in many countries including Canada, United States of America, United Kingdom, Hong Kong, New Zealand, Australia and others.

The educational objectives of the programme are as follows:

- depth in fundamental knowledge of core civil engineering disciplines;
- breadth in integrative skills to apply the knowledge gained;
- appreciation of interactions between engineering, business and technology in modern society;
- drive for life-long learning and continuous self-development; and
- understanding of their role as civil engineers in the development of society at the national and global context.

In addition, the programme ensures that graduates are equipped with the basic civil engineering core competencies to meet the requirements for the practice of civil engineering in Singapore in accordance to the Professional Engineers Board.

The student learning outcomes are aligned to those required by the Engineering Accreditation Board on outcomes for civil engineering graduates and these are as follows:

- apply knowledge of mathematics, science and engineering;
- design and conduct experiments, analyse, interpret data and synthesise valid conclusions;
- design a system, component, or process, and synthesise solutions to achieve desired needs;
- identify, formulate, research through relevant literature review, and solve engineering problems reaching substantiated conclusions;
- use the techniques, skills, and modern engineering tools necessary for engineering practice with appropriate considerations for public health and safety, cultural, societal, and environmental constraints;
- communicate effectively; listening, writing and speaking skills;
- recognise the need for, and have the ability to engage in lifelong learning;
- understand the impact of engineering solutions in a societal context and to be able to respond effectively to the needs for sustainable development;
- function effectively within multidisciplinary teams and understand the fundamental precepts of effective project management; and
• understand professional, ethical and moral responsibility in the workplace.

Degree Requirements

Candidates must satisfy the following requirements to be conferred the degree of BTech (Civil Engineering):

• Complete a minimum of **160 MCs** with a minimum CAP of 2.00;
  (Note: 20 MCs of programme requirements and 20 MCs of unrestricted elective requirements will normally be given as Advanced Placement Credits (APCs) to holders of relevant diploma or higher qualifications. Students will be required to complete a minimum of **120 MCs** of modules as listed below);
• Comply with the requirement that the limit on the number of Level-1000 modules to be counted towards fulfilment of graduation requirements being 60 MCs (including the 20 MCs of APCs); and
• Satisfy any other additional requirements that may be prescribed by SCALE, the Faculty of Engineering, or the University.

List of modules - BTech (Civil Engineering), comprise:

1. All modules are 4MCs, except when otherwise stated.
2. A module with module code TCExxxx is equivalent to the module CExxxx, OTxxxx, ESExxxx and TPxxxxx offered to the full-time students. Subject to the approval from SCALE and the Department of Civil & Environmental Engineering, a student may select a full-time equivalent module in place of any TCExxxx module.

A. **University Level Requirements (20MCs)**
   • Human Cultures (module with prefix GEH)
   • Asking Questions (module with prefix GEQ)
   • Quantitative Reasoning (module with prefix GER)
   • Singapore Studies (module with prefix GES)
   • Thinking and Expression (module with prefix GET)

B. **Programme Requirements (100MCs), comprising**
   1. **Faculty Requirements (8MCs)**
      • TTG2415 Ethics in Engineering
      • TTG2901 Communications for Engineering Professionals

   2. **Major Requirements - Essential Modules (80MCs)**
      • TCE1109 Statics and Mechanics of Materials
      • TTG1401 Engineering Mathematics I
      • TCE2112 Soil Mechanics
      • TCE2134 Hydraulics
      • TCE2155 Structural Mechanics and Materials
      • TCE2183 Construction Project Management
      • TCE2184 Infrastructure & the Environment
      • TME2401 Engineering Mathematics II
3. **Major Requirements – Elective Modules (12MCs, selected from the list below)**

Not all elective modules may be offered in any semester/year. An elective module may not be offered if there is insufficient number of students opting for that module at any particular time. Subject to the approval from SCALE and the Department of Civil and Environmental Engineering, a student may select one Level-3000 or higher module from other programmes within the Faculty of Engineering.

**Construction**
- TCE4282 Building Information Modeling for Project Management
- TCE5604 Advanced Concrete Technology
- TCE5611 Precast Concrete Technology
- TCE5805 Construction Equipment and Methods

**Environmental Engineering and Hydraulics**
- TCE4247 Treatment Plant Hydraulics
- TCE4401 Water & Wastewater Engineering 2
- TCE4408 Environmental Impact Assessment

**Geotechnical Engineering**
- TCE5106 Ground Improvement
- TCE5107 Pile Foundations
- TCE5108 Earth Retaining Structures
- TCE5113 Geotechnical Investigation & Monitoring

**Offshore Engineering**
- TCE5202 Analysis & Design of Offshore Structures
- TCE5206 Offshore Foundations

**Structural Engineering**
- TCE4257 Linear Finite Element Analysis
- TCE4258 Structural Stability & Dynamics
- TCE5509 Advanced Structural Steel Design
- TCE5510 Advanced Structural Concrete Design

**Transportation Engineering**
- TCE4221 Design of Land Transport Infrastructures
- TCE5025 Intelligent Transportation Systems
- TCE5026 Transportation Management & Policy

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**Study Schedule**

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Page 3
There is only one intake per academic year in Semester 1 (i.e. August). One sample study schedule for a four-year candidature is shown below. This assumes the students’ work and other commitments allow them sufficient time to properly cope with their studies. Students are strongly advised to slow down if necessary so that they progress at their own comfortable pace.

Sample Study Schedule (4-year candidature beginning in Semester 1 of an AY):

1. The number of Modular Credits (MC) of a module is denoted by the number in the bracket.
2. Modules marked with an asterisk (*) are modules stretching over more than one semester and the total number of MCs will only be given upon completion of the module.

<table>
<thead>
<tr>
<th>1st Year of studies</th>
<th>Semester 1:</th>
<th>Semester 2:</th>
<th>SpTerm:</th>
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<tr>
<td></td>
<td>TCE1109 Statics and Mechanics of Materials (4)</td>
<td>TCE2134 Hydraulics (4)</td>
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<td>TCE3116 Foundation Engineering (4)</td>
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<td>TCE2184 Infrastructure &amp; the Environment (4)</td>
<td>TCE3165 Structural Concrete Design (4)</td>
<td>TCE2407 Engineering &amp; Uncertainty Analyses (4)</td>
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<td>TME2401 Engineering Mathematics II (4)</td>
<td>TCE3166 Structural Steel Design and System (4)</td>
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<td>Sem 2:</td>
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