

3TU.

3TU MSc in Construction Management and Engineering

Creating the construction leaders of the future

 **TU Delft** Delft University of Technology

 **TU/e** Technische Universiteit Eindhoven University of Technology

UNIVERSITY OF TWENTE.



The challenge of Construction Management and Engineering

Today's construction industry is changing fast. New techniques, shifting roles, complex logistics and globalisation are only some of the factors affecting the character and management of projects. Complex, innovative and multidisciplinary projects in a dynamic environment are calling for a new breed of manager able to competently combine engineering and organisation skills.

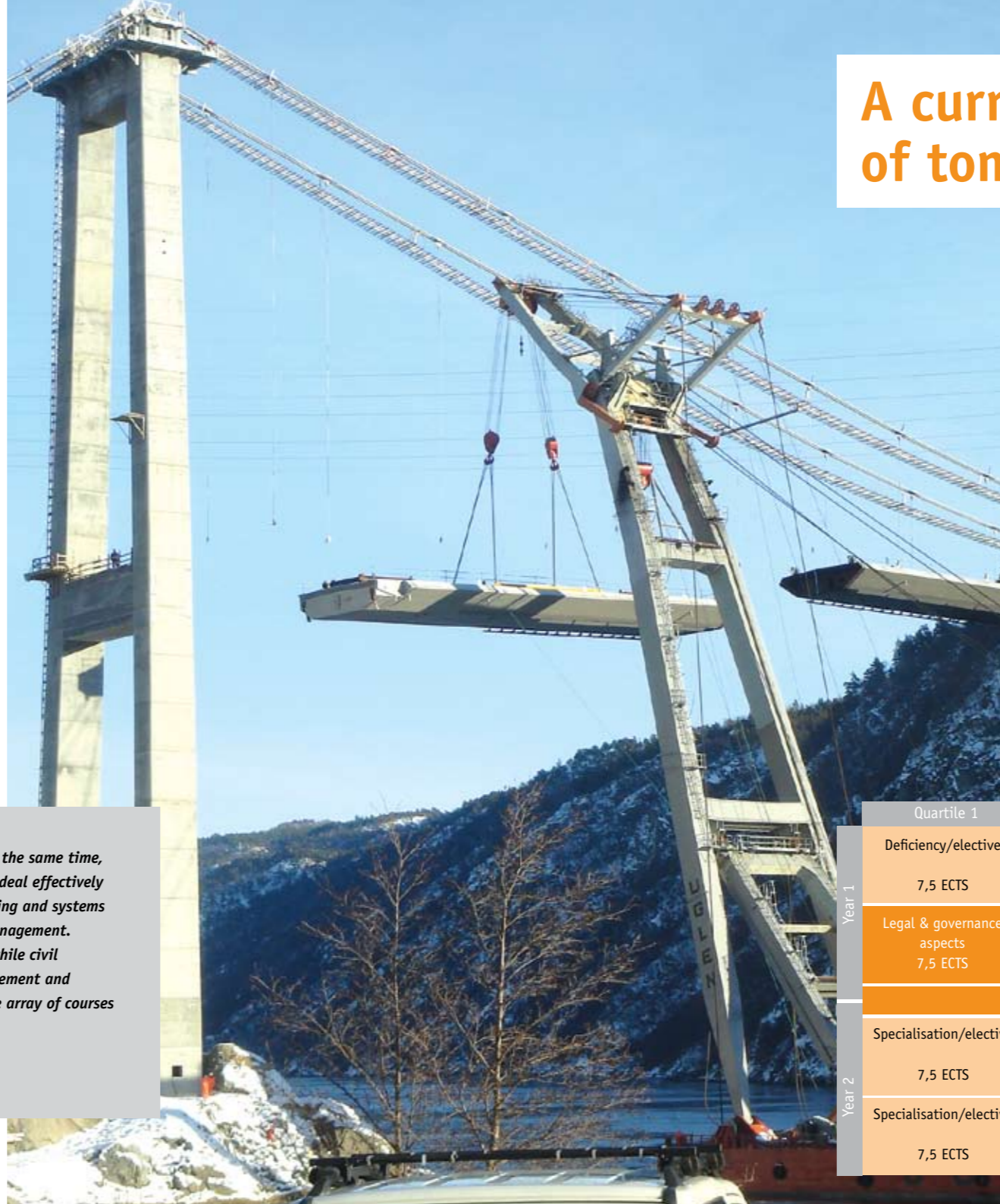
The 3TU* MSc programme in Construction Management & Engineering combines individual technical approaches into processes in which governance issues, societal trends and management methodologies are integrated with cutting edge technology. The broad programme has been developed in close association with the construction industry and is process and design-oriented as well as project-based.

Testimonials

....*"Today's industry is in need of engineers with a solid, technological knowledge base. But at the same time, engineers need more than technological skills. The market desperately needs engineers able to deal effectively with issues such as life cycle management, verification & validation models, financial engineering and systems engineering, RAMS-management (reliability, availability, maintainability, safety), and risk management. Currently, technology management graduates tend to lack in-depth technological knowledge, while civil engineering graduates lack sufficient management and process knowledge. Construction Management and Engineering graduates will be the perfect bridge builders between these two domains. The wide array of courses will also ensure that graduates work effectively across the multidisciplinary spectrum."*...

ir. Hans Ramler, General Manager Multiconsult, BAM Groep Infra

* The three leading universities of technology in the Netherlands - Delft University of Technology, Eindhoven University of Technology and the University of Twente - have joined forces in the 3TU.Federation (www.3tu.nl). This federation maximizes innovation by combining and concentrating the strengths of all three universities in research, education and knowledge transfer.



A curriculum for the needs of tomorrow

The MSc programme CME consists of three blocks: a general block (orange in the diagram), a specialisation block (pale orange) and a final project (grey). The general block provides an introduction to the four cornerstones of this field: project management, process management, legal and governance aspects, and collaborative design and engineering. During the two years students work on different integration & orientation projects which consist of real-life cases, group intervention and introductions to the specialisations. The general block also touches on various specialisations to be chosen in the second part of the programme.

The specialisation block allows students to narrow their focus to one of the key areas of expertise offered by the three universities: the living building concept; complex construction assignments in relation to urban site development; market dynamics, planning & development; and design processes & engineering.

The last part of the MSc programme is the final project (thesis), in which students gain individual hands-on experience in the analysis of complex construction techniques and the exploration of models for integrated solutions. As before, this project is problem-oriented, but takes the form of an in-depth research and design assignment.

	Quartile 1	Quartile 2	Quartile 3	Quartile 4
Year 1	Deficiency/elective 7,5 ECTS	Project management 7,5 ECTS	Specialisation/elective 7,5 ECTS	Specialisation/elective 7,5 ECTS
	Legal & governance aspects 7,5 ECTS	Process management 7,5 ECTS	Collaborative design & engineering 7,5 ECTS	
Integration & orientation 7,5 ECTS				
Year 2	Specialisation/elective 7,5 ECTS	Specialisation/elective 7,5 ECTS	Master's thesis 30 ECTS	
	Specialisation/elective 7,5 ECTS	Preparation Master's thesis 7,5 ECTS		

One programme - three flavours

The MSc programme CME is organised as one coherent programme at each of the three locations. However, the programme can be adapted to suit individual needs, which means that students can sign up for electives at any of the three locations.

Delft: large scale infrastructure

At TU Delft the programme has been jointly developed by three faculties: Civil Engineering and Geosciences; Technology, Policy and Management; and Architecture. Besides the four general cornerstone courses, these faculties offer compulsory and elective courses specific to Delft, including probabilistic design, operations research, plan and project evaluation and risk management.

Most of the second year is dedicated to thesis work. Compulsory courses, such as financial engineering and dynamic control of projects, provide the basis for further specialisation in Delft and elective courses help the student acquire in-depth knowledge to carry out the graduation project effectively. The focus of the graduation work is either on process and system innovation in the building industry in general or on the 'Living Building Concept', which has been developed with the design and construction processes section at the Faculty of Civil Engineering and Geosciences. Within the Living Building Concept there are six main research areas: stakeholder participation, tendering and outsourcing, supply chain integration, value creation, dynamic life cycle support and instrumentation (IT).

Eindhoven: urban development

CME at TU/e focuses on integration of complex assignments in urban area development ('technology pull') and related innovations in technology ('technology push'). This relates to town planning, and more specifically to public-private (re-)development of urban areas; nationally as well as internationally. The fact that urban life continues during redevelopment means another special discipline of construction management becomes involved. Construction management incorporates not only project management, but also - and more importantly - process management and involvement (commitment) into a single vision. The opportunities for technical development offered by new materials and products, and ICT capabilities play important roles. New methods of building and process management are encouraged. The TU/e emphasises innovation in business and entrepreneurial activities through research into (the re-design of) construction processes and related business organization. Sustainability, safety, originality and economy are key assessment criteria in all CME final projects. At TU/e the CME programme is supported by the departments of Architecture, Building and Planning, and Industrial Engineering & Innovation Sciences.

Twente: construction process management

Key research areas of the department of Construction Management and Engineering at the University of Twente (UT) include sustainable building, public-private governance, industrialisation in engineering and construction, supply chain and ICT, markets, organisations and innovation and risk management. The specialisations offered at the UT are closely related to these research areas. Graduate education and research show certain common characteristics.

- *Integration of management and engineering sciences*

The success of construction projects largely depend on well integrated engineering and management. Therefore, management and engineering are combined and integrated, referring to both technical and social sciences.

- *Process integration and innovation*

Looking from different perspectives and covering all stages of the construction process: from initiative and design, to maintenance and demolition.

- *Research for and in close cooperation with the construction industry*

Over recent years a wide network has been built up as a result of cooperation with the stakeholders in the construction industry. Through this network, emerging trends and opportunities can be quickly discovered.



Picture yourself as ...

Career opportunities for CME graduates can be found across the full spectrum of the building and construction industry, at home and abroad. Future employers may include building and construction companies, organizations such as insurers with their own project development department, engineering and design offices and consultancy firms, government agencies such as Rijkswaterstaat (the Directorate General of Public Works and Water Management), NGO's and institutes of research and education. Positions may vary from company or division manager, construction supervisor or construction manager to project manager, technical consultant, project engineer or process manager. Given the wide range of knowledge and skills provided by this MSc programme opportunities are very promising.

Admission requirements

In order to be admitted you should possess a BSc degree from an accredited institute in a related field such as:

- Civil engineering
- Structural Engineering
- Construction Engineering
- Architecture
- Technology and Management

Your grades should be good. Applicants should speak and write English to IELTS 6.5 level or equivalent (e.g. Dutch pre-university education, VWO). Students with a Bachelor's diploma from a Dutch institute of higher professional education (hbo) in subjects relevant to this MSc programme will be admitted after successful completion of a standard pre-master programme at one of the three universities.



What is the 3TU.Federation?

The three leading universities of technology in the Netherlands - Delft University of Technology, Eindhoven University of Technology and the University of Twente - have joined forces in the 3TU.Federation (www.3tu.nl). This federation maximizes innovation by combining and concentrating the strengths of all three universities in research, education and knowledge transfer.

Within the framework of this cooperation, five joint MSc programmes have been developed that address key issues in engineering and society. These five MSc programmes are:

- Construction Management and Engineering
- Embedded Systems
- Science Education and Communication
- Sustainable Energy Technology
- Systems and Control

The main advantages for students

The 3TU MSc programmes have been developed as exclusive programmes of outstanding academic quality that enable you to study at three of the top universities in the Netherlands. These programmes focus on areas of innovation developed with state-of-the-art engineering expertise. You will have the opportunity to acquire qualifications and competences that are in high demand. Upon graduation you will have obtained an outstanding qualification profile. The 3TU masters combine excellent subject-based competences, research skills, the capacity for independent analysis and synthesis and an advanced capability to apply knowledge in practice.

The core programmes of the 3TU masters are largely identical and can be followed at any of the three locations. The admission procedures, teaching and examination regulations and academic calendars at all three universities have been carefully matched. You will benefit from the special strengths of the three universities by choosing a specialisation at any of the three locations. You will be registered at the location of your choice, but you will automatically be co-registered at the other two locations to ensure access to the facilities of all three.



Universities of Technology in the Netherlands

Delft University of Technology (TU Delft)

TU Delft (www.tudelft.nl) is an enterprising university at the forefront of technological development. The university trains the engineers of tomorrow by means of its fundamental and applied research and educational programmes. With its broad knowledge base, worldwide reputation and successful alumni, TU Delft contributes significantly to the development of responsible solutions to urgent societal problems worldwide. The university offers 16 BSc and 39 MSc programmes. With approximately 16,500 students, TU Delft is the nation's largest university of technology with the most comprehensive range of engineering courses.

Delft <-> Enschede 200km
Enschede <-> Eindhoven 178km
Delft <-> Eindhoven 131km



Eindhoven University of Technology (TU/e)

Eindhoven University of Technology (www.tue.nl) is a modern and relatively young university. Students find the atmosphere open, informal and friendly. As an 'Eindhoven educated engineer', you are able to carry out complex analyses and develop solutions based on your findings. You are a problem solver with the ability to design new products, processes and systems. This means you can offer the community new opportunities for sustainability, safety, health, welfare and prosperity. You can look forward to a varied, challenging, lucrative and socially relevant career.

Compared to other universities TU/e has the highest scientific output in cooperation with industry. This position confirms the unique and close cooperation in R&D with the high-tech business sector in Brainport Eindhoven and the rest of the Netherlands.

University of Twente (UT)

Integrating social and engineering sciences. Developing high tech, with a human touch. This is what the University of Twente is committed to. Through teaching and research at the highest level. And through the innovations brought to the market place by over 700 spin-off companies. We offer degree programmes in fields ranging from the behavioural and management sciences to engineering and natural sciences. Research spearheads include nanotechnology, biomedical technology, information technology, governance studies, and learning and cognition.

The University of Twente is the only full-campus university in the Netherlands. 2,700 faculty and staff and 8,500 students and work and unwind in the beautiful green park grounds, supported by top facilities for research and teaching, as well as for sports and culture. It is home to events such as the world's largest annual student think-tank Create Tomorrow. All on less than 2 hours drive from Amsterdam. UT offers 23 BSc programmes and 33 MSc programmes.



How to apply

Admission is jointly coordinated. You are requested to apply only to the university of your preference, because admission and registration at one university automatically means admission and co-registration at the other two. You may switch to another location for your specialisation. All graduates will be awarded an MSc in CME. Admission forms can be downloaded from:

Delft: www.studyat.tudelft.nl

Eindhoven: <https://phobos.tue.nl/tmo-cgi/tmodag/index.opl>

Twente: graduate.utwente.nl/form (international students)

master.utwente.nl/inschrijven (Dutch students)

More information?

For more information visit www.3tu.nl

Additional information can be obtained from:

Delft: ir. drs. J.G. Verlaan, j.g.verlaan@tudelft.nl

Eindhoven: dr. ir. S.P.G. Moonen, s.p.g.moonen@tue.nl

Twente: dr. ir. C.M Dohmen-Janssen, c.m.dohmen-janssen@utwente.nl