



UNIVERSITY OF  
CAMBRIDGE



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# CONSTRUCTION ENGINEERING MASTERS

Equipping business leaders to transform the construction industry

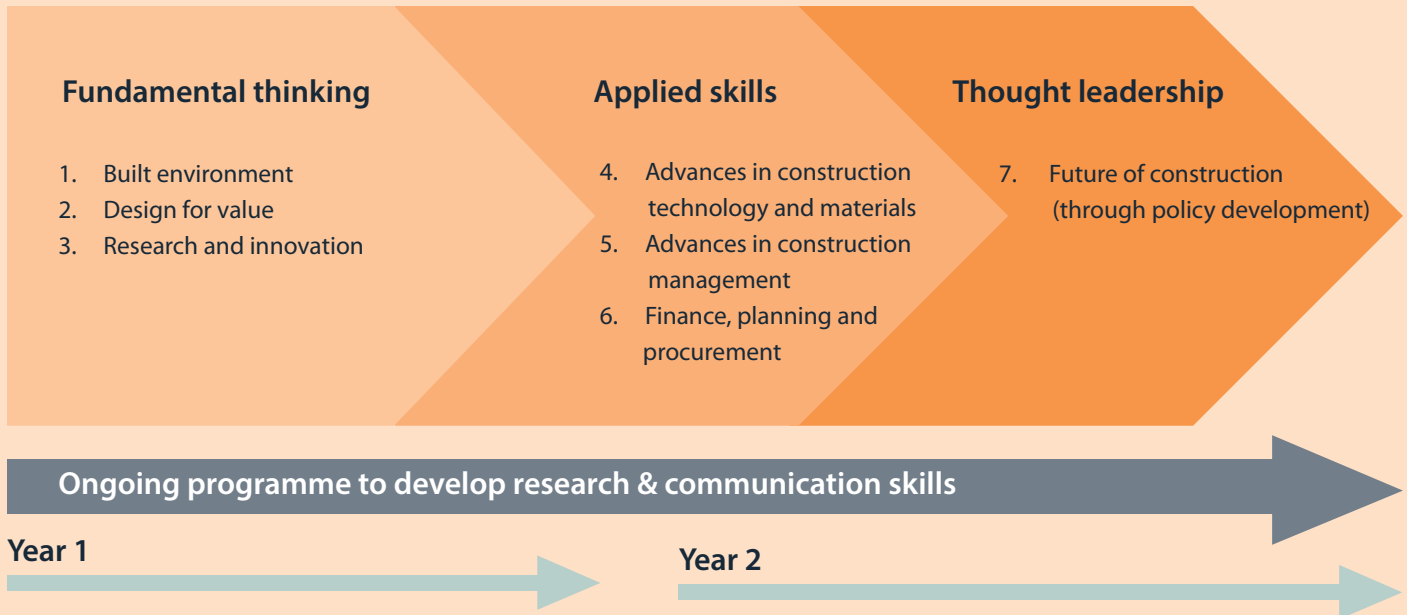
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2020 - 2022  
PROSPECTUS

[www.construction.cam.ac.uk/cem-programme](http://www.construction.cam.ac.uk/cem-programme)

The CEM programme was launched in 2011 with industry partner Laing O'Rourke to fulfil a shared vision of transforming the construction industry through innovation, education and technology.

# CEM Programme Residential Week Themes



**The Construction Engineering Masters (CEM) is the leadership programme for the construction sector.**

The CEM is a Master of Studies (MSt) course run by the Laing O'Rourke Centre for Construction Engineering and Technology in the University of Cambridge Department of Engineering, in partnership with Cambridge Judge Business School and academics from other departments and Universities.

## Aims

The CEM aims to transform the construction industry by empowering agents of change to meet the future challenges of society.

This multidisciplinary leadership programme offers industry professionals the unique opportunity to step beyond their immediate context to explore the future of the industry alongside leading government, industry and academic experts.

The course covers the industry in its broadest sense: from policy and planning through to the physical construction and maintenance of infrastructure. The programme encourages students to challenge current practice and equips them to apply academic rigour to their existing sector expertise, thus uncovering innovative models for improving the performance, efficiency and sustainability of the construction industry.

This two-year, part-time research degree allows students to continue with their professional careers whilst studying, and is designed for candidates with at least five years' professional experience who have either attained or been identified for leadership roles in their organisations.

The programme attracts participants from a range of professions within the wider construction sector representing, for example, clients, consultants, contractors and technology providers, as well as lawyers, architects and construction finance professionals.

## Structure

The CEM is delivered by a combination of academics and industry experts.

Students spend a total of seven compulsory residential weeks in Cambridge - four weeks in the first year and three in the second. A typical residential week includes:

- Lectures, seminars and workshops
- Group projects and presentations
- Individual meetings with supervisors and the Director of Studies

The CEM is primarily assessed through written work completed between residential weeks. Assignments are as follows:

- one 5,000-word case study
  - two 3,000-word essays
  - one 15,000-word dissertation
- Year One  
- Year Two

Topics may be based on an individual's interests, experience and current employment, and are selected with guidance from the student's Director of Studies, who will be one of the CEM academic team members.

Students become full members of Queens' College. The College provides accommodation for the residential weeks and offers pastoral support as well as social and sports facilities.

# Academic and industry involvement

## Core academic team

<b>Dr Kristen MacAskill</b>	<i>CEM Course Director</i>
<b>Prof. Campbell Middleton</b>	
<b>Dr Mohammed Elshafie</b>	
<b>Dr Ioannis Brilakis</b>	
<b>Dr Graham McShane</b>	<i>Graduate Tutor, Queens' College</i>

## CEM Fellows (experts supporting the CEM core academic team)

<b>Dr Brendan Burchell</b>	<i>University of Cambridge</i>
<b>Prof. Alistair Gibb</b>	<i>Loughborough University</i>
<b>Prof. Paul Goodrum</b>	<i>University of Colorado Boulder</i>
<b>Prof. Peter Guthrie</b>	<i>University of Cambridge</i>
<b>Dr Paul Heffernan</b>	<i>University of Cambridge</i>
<b>Dr Julian Huppert</b>	<i>University of Cambridge; former MP</i>
<b>Dr Benn Lawson</b>	<i>Cambridge Judge Business School</i>
<b>Prof. Eve Mittleton-Kelly</b>	<i>formerly London School of Economics</i>
<b>Prof. David Mosey</b>	<i>King's College London</i>
<b>Dr William J. Nuttall</b>	<i>The Open University</i>
<b>Dr Judith Plummer-Braekman</b>	<i>University of Cambridge; former World Bank Financial Analyst</i>
<b>Prof. Phil Purnell</b>	<i>University of Leeds</i>
<b>Prof. Rafael Sacks</b>	<i>Technion - Israel Institute of Technology</i>
<b>Dr Sam Stanier</b>	<i>University of Cambridge</i>
<b>Catherine Tilley</b>	<i>University of Cambridge</i>

## A selection of past contributors

<b>Dr Mark Bew</b>	<i>Chairman, PCSG; former Chairman, BIM Task Group</i>
<b>Tim Chapman</b>	<i>Director, Arup</i>
<b>Prof. Keith Clarke</b>	<i>former CEO, Atkins</i>
<b>Steve Gooding</b>	<i>Director, RAC Foundation; former Director General, Department for Transport</i>
<b>Prof. Peter Hansford</b>	<i>Honorary Professor at UCL; former UK Chief Construction Adviser</i>
<b>Prof. Lord Robert Mair</b>	<i>University of Cambridge</i>
<b>Dr Darryl Murphy</b>	<i>Head of Infrastructure Debt, Aviva Investors</i>
<b>Liam O'Keefe</b>	<i>Project Finance Advisor and Consultant; former MD Crédit Agricole CIB</i>
<b>Nick Raynsford</b>	<i>Deputy Chairman of Crossrail; former Minister for Construction and Minister for Housing</i>
<b>Dr Mark Raiss</b>	<i>Engineering Director, Civil Infrastructure, AECOM</i>
<b>Hannah Vickers</b>	<i>Chief Executive, Association for Consultancy and Engineering (ACE)</i>
<b>Paul Westbury</b>	<i>Senior Vice President - Development &amp; Construction, Strategy &amp; Operations at The Madison Square Garden Company</i>

## Themes

### 1. The built environment

Explores the wider context of the built environment focusing on the United Kingdom but recognising the international nature of the industry. This week provides a strategic overview of the current state of the construction industry, of infrastructure in the UK and abroad, the economic and political framework within which the industry currently operates and management of risk and uncertainty.

### 2. Design for value

Provides an overview of how the construction industry equips itself to achieve value and, through exploring value in different contexts, how the industry attempts to address the needs of clients in the public sector, private sector and society at large. Students are introduced to complexity theory and how it can be used to understand organisations and the value they deliver.

### 3. Research and innovation

Covers the fundamental principles of developing, implementing and managing effective innovation techniques, processes and procedures - exploring examples of innovation emerging from current research in the department and elsewhere.

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The only Master's-level course that provides the core understanding of how to influence and advance our industry. This is essential for our future leaders.

Tim Chapman FICE FIEI FREng  
Director at ARUP - Infrastructure

### 4. Advances in construction technology and materials

Explores (at a high level) analysis methods, modelling and the development and use of different types of materials. This module provides an insight into the state-of-the-art for common materials, special novel materials, key areas of advanced construction technologies and how materials and technologies (such as robotics, artificial intelligence and the use of big data) might contribute towards advances in construction practice.

### 5. Advances in construction management

Covers concepts and methods used to manage construction projects/businesses, not basic project management processes that may be covered in more traditional construction management degrees. Challenges of management and the methods for planning operations and improving productivity are explored as well as key aspects of leadership.

### 6. Finance, planning and procurement

Familiarises students with different models of financing construction projects in the UK and globally. They will learn about the necessary elements required to support project finance and procurement including contractual agreements, sources of capital and financial structuring. Some elements of construction law are also covered.

### 7. The future of construction (through policy development)

Creates greater links between construction engineering and policymaking. It will advance students' skills in advocacy on relevant policy issues, applying all the skills developed throughout the two year programme.

# Dates and Fees

## Residential Weeks

Students spend a total of seven residential weeks in Cambridge during the two years of the programme.

Residential Weeks 2020 - 2022		
2020	13 - 18	September
	13 - 18	December
2021	11 - 16	April
	4 - 9	July
	12 - 17	December
2022	3 - 8	April
	11 - 16	September

## Programme Fees

The fees for the entire two-year CEM programme are as follows:

Costs	Total
Combined University and College Fees	£ 24,948
Accommodation* and meals (based on an average of £250 per residential week)	£ 1,750

\* Please note accommodation rates are set independently by Queens' College.

Most of our students obtain full or partial funding from their employer. Where this is not possible, bursaries may be available for a proportion of the combined University and College fee. Please contact the Centre Manager for more information.



CEM programme core academic team

# How to Apply

To apply for this programme you will need to have\*:

- A first or upper second class UK honours degree or overseas equivalent in a discipline associated with infrastructure development.
- At least five years' professional experience.

\*If you have alternative experience or qualifications, you should contact the Centre Manager for advice. We are looking for people who are passionate about making a difference and are on a path to leadership.

You should consider carefully your capacity for balancing personal and professional commitments before submitting your application.

**Applications open on 2 September 2019 and close on 30 April 2020.**

Applications for the CEM programme are managed online by the Institute of Continuing Education at the University of Cambridge.

To apply online please go to:  
[www.construction.cam.ac.uk/cem-programme](http://www.construction.cam.ac.uk/cem-programme)  
and click the 'apply now' link.

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It feels like I have been walking around with my eyes closed for years and the exposure to all of this knowledge, experience and perspective has opened them wide.

It's mind expanding...  
Transformational!

Rob Higginson,  
Commercial Leader, Laing O'Rourke  
(CEM student 2018)

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## Find out more

Visit our website:  
[www.construction.cam.ac.uk/cem-programme](http://www.construction.cam.ac.uk/cem-programme)  
Email: [centre.manager@construction.cam.ac.uk](mailto:centre.manager@construction.cam.ac.uk)  
Telephone: +44 (0) 1223 332812





## Benefits

The fundamental goal of the CEM is to further educate and inspire emerging leaders, equipping them with the knowledge, leadership and communication skills to effect change in the construction sector. The programme is designed to enhance students' skills, confidence and sector-wide networks, benefitting their professional development and ultimately the performance of their companies and the industry.



### KNOWLEDGE

Students broaden their knowledge base and perspective of the industry by exploring a range of construction activities and sectors and by conducting their own evidence-based research projects.



### DEVELOPMENT

The programme supports the students' career progression and professional development – their technical and analytical expertise as well as communication, leadership and managerial skills.



### NETWORKING

Cohort sizes are approximately 25 – 35 people, creating a unique, close network of high-flying, like-minded thinkers, hand-picked by organisations to advance the transformation of the construction industry. There is also direct interaction with other current cohorts.



### MEMBERSHIP

Students become full members of Queens' College where they benefit from hospitality during residential weeks, a lifetime College membership and CEM alumni network.



This degree is accredited by the Joint Board of Moderators (JBM) as meeting the requirements for Further Learning for a Chartered Engineer (CEng) for candidates who have already acquired a partial CEng accredited undergraduate first degree. The JBM consists of the Institution of Civil Engineers, the Institution of Structural Engineers, the Chartered Institution of Highways and Transportation and the Institute of Highway Engineers.

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I believe this course is not only unique but vital for our industry... I would 100% recommend this course to others in the industry.

Through this course we will begin to transform the industry.

Kate Hall,  
former Design Director HS2 Ltd.  
(CEM student 2016)





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The importance of the Construction Engineering Masters cannot be overstated. Nowhere else can our industry leaders of tomorrow question and engage in such depth with the current challenges and opportunities of the industry.

The constructive small-room environment and air of collaboration and common purpose is tangible and exciting.

Professor Lord Robert Mair CBE FREng FICE FRS  
Emeritus Professor of Civil Engineering and  
Director of Research at the University of Cambridge

I have thoroughly enjoyed being part of the Construction Engineering Masters programme and have been using the learnings in my job on a daily basis.

... the programme transports students from their daily jobs into the inspiring environment of Cambridge University to focus on one thing - creating the next generation of leaders for the industry.

Marcel Broekmaat,  
Director, Product Management, Connect Applications, Trimble  
(CEM student 2017)

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## Contact us

Centre Manager

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