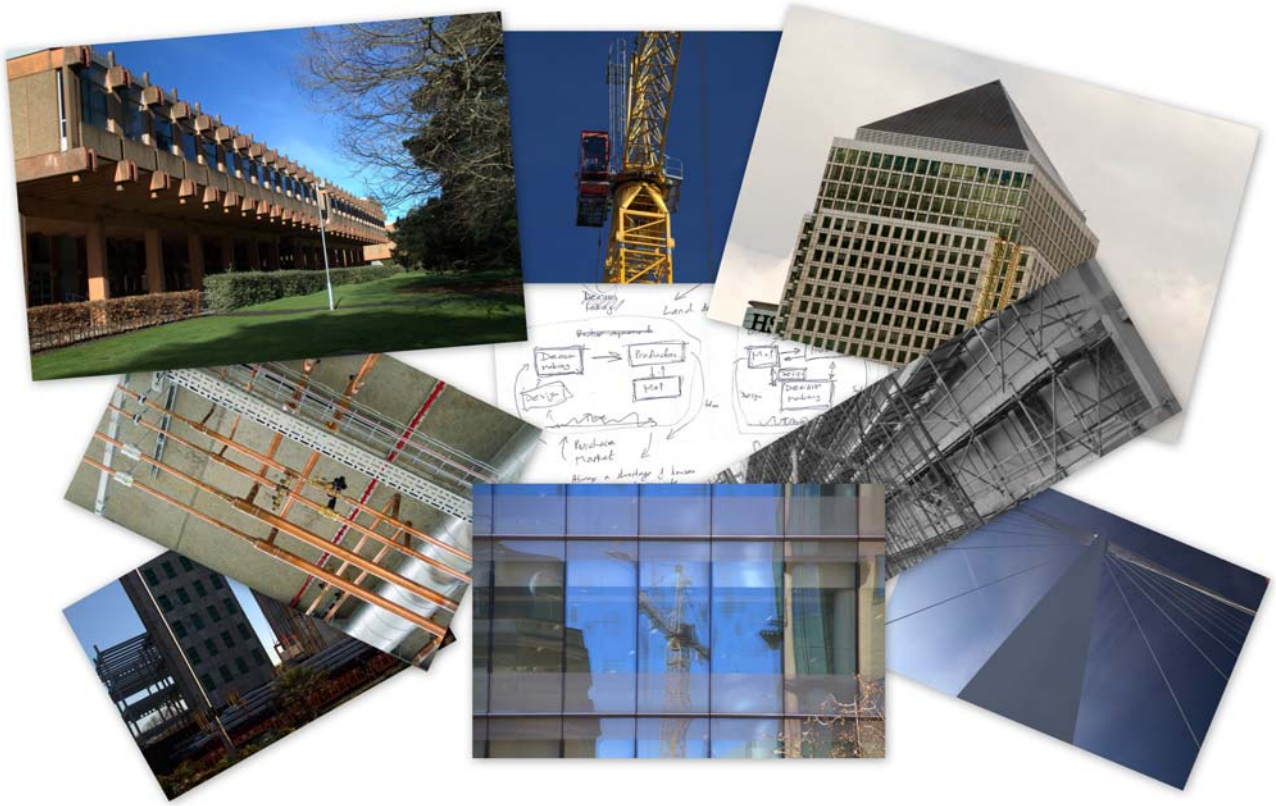
School of the Built Environment

University of Reading

MSc Programmes in The School of the Built Environment

Programme Guide and Handbook 2019/20



The aim of this Programme Handbook is to provide specific information on MSc programmes in the School of the Built Environment. The handbook explains how we support our degree programmes and provides other sources of important information. More general information about the University and key academic policies and procedures can be found in "Essentials" (student.reading.ac.uk/essentials).

The MSc Programmes in The School of the Built Environment are devoted to discovery and creative thinking, designed to question and challenge conventional wisdom in the built environment. In a fast-moving and changing market for professional skills, fresh ideas are needed. Our MSc programmes are focused on ensuring an excellent student experience. The aim is to engage postgraduate students in the co-creation of new knowledge and understanding about complex and difficult problems.

The School of the Built Environment is one of the world's leading university departments dealing with the built environment. Our reputation is based on the recruitment of successful students from all over the world and on the authority of our academic staff, who have extensive experience as advisors, consultants and visiting lecturers to commercial organisations, governments and universities throughout the world. This wide range of expertise and international experience contributes directly to the quality of our degree programmes and research activities.

It is the responsibility of students to familiarise themselves with the Programme Handbook and with the content of Essentials, and to use them as a reference when required.

The material in this handbook can be provided in alternative media. Please discuss your requirements with the School (email sbepostgrad@reading.ac.uk).

DISCLAIMER

Formal Ordinances and Regulations are given in the Governance Zone[1] and programme requirements in the Programme Specification[2] and in relevant module descriptions[3]; should there be, or appear to be, any conflict between statements in this handbook and the Ordinances, Regulations, Programme Specifications or module descriptions, the latter shall prevail.

Although the information in this Handbook is accurate at the time of publication, aspects of the programme and of School practice may be subject to modification and revision. The University reserves the right to modify the programme to reflect best practice and academic developments for the benefit of the students, to improve the programme and your experience of it, to meet the requirements of external or accrediting bodies, as a result of staff changes or changes to the law. In such circumstances, revised information will be issued. Information provided by the School during your programme should, therefore, be regarded, where appropriate, as superseding the information contained in the handbook.

Please keep this handbook in a safe place as you will need to refer to it throughout your programme. This handbook is for students commencing the programme in 2019-20.

[1] https://www.reading.ac.uk/about/governance/governance-zone.aspx
[2] http://www.reading.ac.uk/progspecs/
[3] http://www.info.reading.ac.uk/module/

Contents

A – Introduction

Welcome to the School of the Built Environment. This handbook relates to MSc programmes in Construction Management and Engineering, which is a part of the School of the Built Environment.

As a postgraduate student, you have many opportunities and a lot of freedom to organise your time. However, these programmes are intensive, and you will find it useful to plan your time wisely. There will be a lot to do and deadlines are unforgiving. Make sure you do not leave things to the last minute. If you are worried about your studies, please tell us! We can always help. We want you to succeed.

While you are here, we hope that you can take advantage of the facilities that are offered, especially for sport and recreation. There are plenty of opportunities to unwind and refresh yourself between your study commitments. Please make the most of them.

This handbook contains a lot of useful information about the University, the School, the Programme and the expectations on all of us, including you. Please read it carefully and check for revised versions occasionally.

We hope you enjoy your time here.

Finding your way around

We are based on the main Whiteknights campus, which covers 300 acres of parkland. The academic staff for Construction Management and Engineering are based in the Chancellor's Building. This also contains our computer labs, technical labs and the Resource Room, all of which are for you to use. Sometimes, these facilities are booked out for classes. Every teaching room on the campus has a list of booked classes on the door, so you can check whether the room is free and whether it is booked for the class you are expecting to find there. These booking sheets are replaced every Monday morning and show the bookings for the current week. We hope that you will develop the habit of finding rooms before the time of a class or a meeting, so that you know where you are going. Occasionally, you might need to visit the London Road campus. This is also an interesting site to visit. As well as the School of Architecture, which is part of our School, there is a café and a pleasant working environment that you may enjoy.

💻 Map of the Whiteknights Campus
💻 Map of the London Road Campus

Accessibility

There is a lift in the Chancellor's Building on the ground floor next to the middle staircase. There are also accessible toilets on both floors. All rooms in the Chancellor's Building are accessible by wheelchair.

Communication

Email is used as the standard formal means of communication between staff and students.

Members of staff and key contacts

This section provides details of key roles of some of the people you may need to know about. More complete details are available on the School's staff web pages.

💻 Construction Management and Engineering staff

Head of School – Professor Chris Harty

The Head of School (c.f.harty@reading.ac.uk) is responsible for the academic leadership, resource and operational management the School as well as representing the School and University with external bodies.

School Director of Teaching and Learning – Dr Tabarak Ballal

The Director of Teaching & Learning (t.ballal@reading.ac.uk) is responsible for providing leadership in the teaching, learning, assessment and feedback in the School's taught programmes.

School Director of Postgraduate Taught Studies – Dr Graeme Larsen

The Director of Postgraduate Taught Studies (g.d.larsen@reading.ac.uk) provides leadership for the School's MSc programmes and coordination between the programmes.

Programme Directors

Your programme director is responsible for leading your MSc programme and will generally be your main point of contact with the University.

Construction Cost Management
Dr Florence Phua, f.phua@reading.ac.uk

Construction Management
Prof Will Hughes, w.p.hughes@reading.ac.uk

Design and Management of Sustainable Built Environments
Prof Runming Yao, r.yao@reading.ac.uk

Construction in Emerging Economies
Dr Tabarak Ballal, t.ballal@reading.ac.uk

Information Management for Design, Construction and Operation
Dr Dragana Nikolic, d.nikolic@reading.ac.uk

Project Management
Dr Shu-Ling Lu, s.lu@reading.ac.uk

Renewable Energy: Technology and Sustainability
Dr Maria Vahdati, m.m.vahdati@reading.ac.uk

Programme Administrators

The team may be contacted on sbe-postgrad@reading.ac.uk where all messages are picked up quickly by someone who will know how to respond.

Department Director of Academic Tutoring – Dr Katherine Hyde

Department Directors of Academic Tutoring (k.hyde@reading.ac.uk) provide School-level leadership for student academic, personal and professional development.

Support Coordinator

Your Student Support Coordinators are the people you see when you visit your Support Centre. They can help you with anything from a query about Campus Cards, advice on changing programme or on module selection, submitting extenuating circumstances forms, to any other general or programme-specific question.

You can telephone or visit your Student Support Coordinators in person between 8.30am-5.00pm during term time (9.00am-4.00pm during University vacation periods) (Student support), or, you can log an enquiry on **Ask a Question** via the RISIS portal.

Careers – Adrian Tagg

Our industry liaison person is Adrian Tagg (scmecareers@reading.ac.uk). He is a key contact for all aspects of career development and employability. You will receive regular emails from employers seeking graduates throughout your time here. We also run a Built Environment careers fair, so keep your eyes open for that!

The specifics of the kind of careers that our graduates pursue are given in the overview section for each of the MSc programmes on the following pages in the **Programme information** section.

The University also have a vibrant careers centre in the Carrington building.

💻 Careers and Professional Development

Reading University Construction Society (RUCS)

The student-run society is a social and cultural hub for our students. RUCS is an active society which provides an exciting range of events enabling students to create professional relationships as well friendships.

The Society provides a networking platform that encourages interaction and collaboration between students, alumni and industry professionals through informal events. RUCS aims to increase the employability and knowledge of its members through organised student events with leading employers and professional institutions. Several industry leaders are corporate members of RUCS, including Turner & Townsend, Malcolm Hollis, and Alinea, and recently the President of CIOB and former student of the School, Paul Nash, delivered a talk for the Society. RUCS empowers students to build a personal network of industry contacts, taking their first steps towards building their own career.

RUCS is also renowned for its social activities and provides an active calendar of events throughout the year, including the annual gala black-tie dinner and the annual student-staff football match. The Society is integral to our supportive community, bringing students from across all years and academic staff together in an informal setting, through a variety of events, enhancing the quality of student life in the School.

💻 Reading University Construction Society

B – Reading Student Charter

Partners in Learning

Staff and students have worked together to develop this charter that clearly sets out what we all expect of each other. It recognises the importance of an effective partnership commitment, in which the University and its staff have professional obligations but where students are also responsible for themselves as learners and as individuals.

Students expect the University

- to provide an excellent and varied learning experience;
- to deliver degrees with relevant content informed by the latest research;
- to provide access to learning resources and facilities that allow you to excel;
- to offer opportunities to gain knowledge and skills useful for life beyond University;
- to provide support for professional development and access to career information, advice and guidance;
- to provide a broad range of social, cultural, sporting and co-curricular activities;
- to facilitate opportunities to express views which are considered and responded to.

Students expect staff

- to teach in an engaging and varied manner that inspires learning;
- to give timely and constructive feedback on work;
- to provide effective pastoral and learning support when needed;
- to respond, communicate and consult in a timely and effective manner;
- to recognise the student body to be a diverse collection of adults who are partners with an equally important voice in their learning.

The University expects students

- to work hard at their studies and be active partners in shaping their experience of Higher Education;
- to seek out opportunities to enhance their understanding and to develop practical and intellectual skills;
- to take advantage of the wealth of activities (social and developmental) provided by the University and the Students Union;
- to be aware that their conduct affects other students and reflects on the University and to act accordingly;
- to provide constructive feedback on their time at Reading through the Students Union and directly to the University.

Staff expect of students

- to be pro-active in managing their learning and in seeking help when needed;
- to be enquiring in their thinking;
- to manage their time to fulfil academic and other commitments;
- to engage fully with all academic commitments;
- to conduct themselves and to engage in their studies with honesty;

- to keep appointments and to communicate with staff in a timely and courteous manner;
- to take ownership of their own health and well-being.

We all expect of each other

- to treat one another with respect, tolerance and courtesy regardless of identity, background or belief, both in person and online;
- to show responsible stewardship for the university environment, facilities and resources;
- to challenge one another intellectually and to contribute to the advancement of knowledge;
- to work fairly and effectively with one another both inside and outside of academic context;
- to be accountable for our actions and conduct;
- to recognise and value positive contributions from others.

C – Partnership

The foundation of our academic community

The following principles underpin student-staff partnership at Reading Partnership:

- Is based on values of trust and respect
- Is empowering and inclusive
- Enables the co-delivery of meaningful change
- Involves negotiated responsibility for both the process and outcomes of enhancement activities
- Creates a sense of belonging to an academic community

D – How to get started

Term Dates

The term dates for the next three academic years can be found below.

💻 Term Dates

Enrolment and your Campus Card

Every academic year you are required to enrol with the University, whether you a starting a new programme or continuing a course that you were on last year.

New Students/Starting a new course of study

Before you arrive at the University, you **must** enrol for your course online. Details of the steps you need to follow can be found here or in your Welcome Guide. When you arrive on campus, one of the first things you need to do is to collect your Campus Card. Once you have collected your Campus Card, which will be yours for the duration of your time at Reading, you are a fully enrolled member of the University of Reading. You can now retrieve your University log in details which will give you access to your email, timetable and Me@Reading student portal.

Your Campus Card also allows you access:

- to the University Library
- 24-hour IT/computer facilities
- to study lounges
- some buildings and rooms where access facilities have been installed (which may include our Hall of Residence)

Topping up you Campus Card account with money enables you to:

- pay for printing
- pay Library fines
- pay for food, drink and services at tills using the Campus Card Portal
- benefit from special discounts and offers exclusive to those paying using the Campus Card

More information on using your Campus Card can be found using the link below:

💻 Information on Campus Card

Returning Students

It is important that as a returning student you also complete re-enrolment each year. Details on how to do this can be found using the link below:

💻 Information on Enrolment

Term time addresses and phone numbers

You are required to maintain your student record via the RISIS portal. This includes entering an up-to-date local contact address (i.e. your term-time address) and (where

possible) mobile phone numbers. It is very important that we have these details in case of an emergency and to send, or forward, correspondence to you if needed.

💻 University of Reading RISIS portal login page

Email

You should note that email is the default means of communication between staff and students. You must use your official University email address when communicating with the University. Please note the following:

- The University guarantees that your University of Reading email account will be available to you for the entire duration of your studies.
- The University guarantees that suitable, supported email software will be available to you for the entire duration of your studies.
- The University offers an email service to standards of availability, reliability, performance and security which it determines, and which are under its own control.
- Email sent from non-University mail accounts may be classified as 'spam' and not read.

Information is also provided electronically:

- You can find detailed information on modules and school specific information using the Blackboard Learn portal:

  💻 Blackboard Learn portal login page
- You can find your personal information on the RISIS web portal:

  💻 University of Reading RISIS portal login page
- And via Essentials:

  💻 Essentials homepage.

It is important that all communications between you and the University are conducted in line with the following statement:

You will use your University email account or the relevant University virtual learning environment for all communications with the University. You understand that the University will use your University email account to formally communicate with you following registration (unless the University agrees otherwise). As such it is the University's expectation that you will check your University email account daily and you agree to do so at least once a week.

Me@Reading student portal

Me@Reading gives you access to everything you'll need during your time here.

- your University email inbox
- your academic timetable
- news, articles and events tailored to you
- links to useful resources like Blackboard, RISIS and the Library
- the latest updates from social media

How do I access Me@Reading?

Once you've picked up your Campus Card and retrieved your University username and password from RISIS, you're ready to go. Simply visit the student sign-in page and use your University username and password to log in. Me@Reading is updated every day, so bookmark it and check it often to keep up to date with university life.

💻 Student sign-in page

Module selection

As a postgraduate taught student your course offers optional modules. You will be required to select these online. This process is called module selection and takes place in September.

Further information can be found on Essentials:

💻 Information on Module Selection

For Flexible-modular students, at the beginning of each year of your programme, you will be asked to choose your core as well as optional modules.

For any module choices, it is possible to change your choices if you notify the administrative team at least two weeks before a module is due to run. Once a module starts, you cannot subsequently de-enrol yourself and you will be committed to the assessment for the module. If you are having difficulties attending a module, you must discuss this with your Academic Tutor with a view to submitting an Extenuating Circumstances Form via the on-line system in RISIS.

Your timetable

Your timetable holds information on all the classes you need to attend as part of your programme. This includes lectures, seminars, workshops and any other events which form part of your programme. Information on how to access your timetable and syncing your timetable to your phone, along with help and support can be found on Essentials.

💻 Information on your timetable - Essentials website

Blackboard

Blackboard is our online Virtual Learning Environment (VLE), where you will find lecture notes, reading lists and other course material. You will also use it to submit your coursework assignments on-line

💻 Electronic assessment submission
💻 Information on Blackboard

Reading lists

Your online reading list is created by your module convenor and is accessible through your module content on Blackboard. These can also be found in our online reading list software, Talis, at reading.rl.talis.com and in the Blackboard area for each module. At any time,

whether you are enrolled on a module or not, you can see the reading list for a module. All you need is the code. For example, for CEM206 Construction Contract Law, simply enter CEM206 into the search box and click search. When you are looking at a module in Blackboard, and you access the reading list there, it picks up the same data from Talis as if you were in Talis. Please, in every module, use the reading lists to guide you into the literature.

Your reading list is an interactive and dynamic list of recommend readings, which provides quick links to:

- real-time information about Library books' availability,
- digital Library resources such as e-books and e-journal articles
- links to external web pages and embedded multimedia,
- scanned extracts of key readings requested by academic staff through the Library's scanning service.

For more help making the most of your lists, please visit the online guide:

💻 Online reading lists: a guide for students

Core reading is important in developing an understanding of each topic. It is not possible to make adequate progress without reading. And it is very difficult to read anything without writing while you read: make notes. Try to avoid merely summarising, though. Note down questions that occur to you and things that the reading puts you in mind of. Think not simply about what the authors wrote but also what they did that enabled them to write it. What kind of research was done? What methods were used to carry out the research? Where was it carried out and when? Everything you read has a context and limits of applicability. Use these to help inform your notetaking. Never read without making notes. As well as referring to textbooks, it is essential to be aware of the latest research papers in each topic. Please see the subject guide at http://libguides.reading.ac.uk/construction. There is also some general information at http://libguides.reading.ac.uk/reading-lists/students.

E – Programme information

We offer seven MSc programmes. Each can be taken as a one-year full-time programme or as a flexible-modular programme. In this University, flexible-modular is a term used to describe a specific type of part-time programme that provides students with the choice about how many years to spread their period of study, usually between two and five years. MSc candidates must complete 180 credits to satisfy the requirements of the programme. Several intensive one-week modules take place, often with students from other MSc programmes in the School. Ten credits represent about 100 hours of study, most of which is not in class.

Structure

All our MSc programmes share a common structure. At the heart of each programme are important modules relating to research skills, dissertations and integrating studies. First, the dissertation involves a sustained piece of supervised research and writing throughout the period of study, supported by supervision and a separate module in research skills. Second, each programme has an integrating core module in which the material from the taught modules is integrated and applied through case studies or other applied work (for flexible-modular students, the integrating module is split into two modules of 20 credits each, one for each of the two years of study). Outside these key modules, the learning is achieved in one-week modules spread throughout the programme with assignments and coursework. Each ten-credit module is taught completely and exclusively within an intensive week of classes, with the assessment to be submitted some weeks after the module. There are optional modules in every programme, enabling a flexible programme tailored to individual student needs.[1]

Each MSc programme involves a specific set of core modules and some optional modules. The outlines of each MSc programme are given in the following pages. The subsequent section provides summaries of each module to help students choose their options.[2]

Each of the module weeks consists of a mix of formal lectures, participative activities and study/research time. Between the module weeks, students will study for dissertations and assignment work from the modules. Full-time students may be involved with lectures and talks from guest speakers as well as site visits and field trips between the module weeks. All students are supported in their learning using the on-line system, Blackboard, accessed with your University username and password. Most modules are opened to students only when there is some content in them. It is quite usual for content to be unavailable until just before a module is taught.

At the beginning of your period of study, you will be asked to provide information about which optional modules you wish to choose. We need an early indication of module choices so that we can book appropriate rooms and schedule sufficient resources. However, you may change your options within reason, but not later than two weeks before an option is time-tabled to run. Programme Directors and module convenors are happy to advise on module content and choice.

[1] Please be aware that there are some timetabling constraints that preclude certain combinations of modules.

[2] Throughout this document, numbers in brackets after module names indicate the number of credits in each module. All MSc programmes must add up to 180 credits.

Please note that, while every effort has been made to ensure that the syllabus is accurate, the University reserves the right to amend the content as necessary and appropriate. The research-led philosophy of the programme often means that new topics are introduced at short notice. This is always done in the best interests of the students.

Please note: this handbook is for explanatory purposes. The formal programme specification is available at www.reading.ac.uk/progspecs and the formal module descriptions are available at www.reading.ac.uk/modules. You can access your **further programme information (FPI)** by logging onto the RISIS Portal:

(i) Select the "information" tab
(ii) Select "programme and modules" from the drop-down list
(iii) Click on the link for "Further Programme Information for 2019/20"

Flexibility

All our MSc programmes are offered as a one-year full-time programme, starting in September each year, or two-year flexible-modular programme, starting in January or September each year. (Please note that a January start will involve a period of study that is nine months longer than a September start.)

The modular structure of the programmes allows students (whether full-time or flexible-modular) to select subjects that meet their own needs and interests, while developing a core set of knowledge and skills. In addition to the underlying theoretical principles, there is also a strong focus on the development of critical thinking ability together with the practical skills that are needed to make a difference in practice.

For flexible-modular mode of study, our expectation is that the programme will be completed in two years, although it may cover up to five years of study. Every module has a defined schedule and, once started, must be completed on time. However, the integrating module for flexible-modular students has been split into two halves, each of which is taken in a separate year. The research skills module in each programme is intended to be taken in the first year of study, while the dissertation module in the second or subsequent year. This avoids the need to spread single, large modules over multiple years. Finally, the optional modules can be spread out during the period of study, since they all run every year. Teaching typically takes place in single-week modules, Monday to Friday, usually commencing Monday at 14:00 and concluding 12:30 on Friday, with all other times as 09:00-17:30. Please be aware that a few modules do not follow this framing, so it is advisable to check in advance if you need to make arrangements, such as child-care or work, in order to attend classes.

Assessment

Assessment of student work is done with a range of different methods, mostly by written assignments but also with some modules using on-line tests, group work, presentations, and so on. A few modules have formal examinations. Each ten-credit module is contained within a single timetabled week focused solely on that module, with the assessments being scheduled in relation to the particular module week.

Full details of assessment requirements for the programme and the modules are given in programme specifications (see next paragraph). Details of how modules are allocated to programmes can be found on pages 36-37 of this document.

Guest attendance at modules you are not enrolled on

Students may attend classes in modules for which they are not enrolled, subject to the agreement of the module convenor, the capacity of the room and by prior arrangement. It may be possible to attend an entire module as a guest but there would be no opportunity to submit work for assessment. Any such attendance would not contribute towards your final mark or degree classification. However, if you choose to attend an unenrolled module for personal development reasons, we will monitor attendance and we may be able to certify this on your final transcript (subject to changing policies in this area). This is something that you can then declare on your CV. Some students have found this a useful to response to the problem of having too many interesting modules to choose from. There are no tuition fees for guest attendances. If you want to attend a module as a guest, please talk to the Student Support Co-ordinator at least two weeks before the module commences.

If you're interested in guest attendance, you should first discuss it with your Academic Tutor, who will help you consider the impact it may have on your main programme of study and your overall workload. Guest attendance at lectures, or other learning events may not appear on your timetable; you will be responsible for finding out the timetabling requirements and regularly checking Blackboard posts for any scheduling changes. It is important to note that guest attendance does not enable you to enrol formally on the relevant module after the normal deadline, nor is it acceptable grounds for extenuating circumstance requests.

Students studying part-time

Any of our MSc programmes may be taken on a full-time or a flexible-modular basis. To facilitate this, all the teaching is in block weeks, so that full-time and flexible-modular students are study together. Time is given after the module for submission of assignments. More time is given to flexible-modular students, since they are assumed to be in full-time work while studying part-time. The expectation is that flexible-modular students will complete their studies in two years. But the maximum period for registration for flexible-modular students is 63 months, enabling them to pace their studies along with their other responsibilities. There is an option for flexible-modular students to enrol in January each year, but January starters need three years minimum to complete their programme of study.

Site visits that take place when a module is not running are generally designed for full-time students. We assume that flexible-modular are already working in a job that provides regular opportunities to visit sites. If a site visit is an essential feature of a specific module, it will take place during the module week.

In the case of flexible-modular students, programme directors are happy to hold meetings over Skype or telephone. It is important to maintain contact.

Safety

For those students whose programmes include laboratory work, an introduction to laboratory use, procedures and safety will be held early in the first term, and before commencement of laboratory practical work. Information about safety procedures, the specific responsibilities of students, and the Health and Safety at Work Act will be issued at this session.

Additional costs of studying

During your time studying at Reading, you may encounter some additional costs, for example field trips, textbooks, or stationery. Many MSc students, for example, need a pair of safety boots for site visits. These must fulfil the requirements for health and safety legislation. If you do not have appropriate boots, you will be denied access to building sites. This strict requirement may be unfamiliar to those new to the UK construction industry.

Additional costs will be made clear on your programme specification and relevant module descriptions. It is prudent to budget appropriately for these costs, and the Advice Service in the Students' Union can help you either by email or personally. You can also visit the website below for more generic information. More specific information can be given by your Department or School.

✉ advice@rusu.co.uk

💻 RUSU Money Advice

💻 University of Reading Student Financial Support Team

MSc Construction Cost Management

Overview

MSc Construction Cost Management is for graduates of any discipline who are interested in a career in construction cost management or quantity surveying. Cost management comprises every aspect of a project from concept through design, production and occupancy. It involves new projects, refurbishment projects, heritage restoration and the maintenance of all built facilities. Students will develop a broad understanding of management principles, cost, time, and quality management, with the legal and contractual aspects of project delivery. The programme has an international perspective and is open to applicants who are considering a career in cost management with public and private sector clients, consultants or contractors in the building and civil engineering sectors, including oil and gas. This programme is accredited by the RICS and CIOB.

Core modules for full-time students	
CEM10A	Research Skills (20)
CEM10B	Research Dissertation (40)
CEM104	Construction Cost Management Principles and Practice (40)
CEM202	Construction Project Management (10)
CEM206	Construction Contract Law (10)
CEM228	Construction Economics (10)
CEM237	Basic Measurement Principles (0) *(Prereq. for CEM238)*
CEM238	Construction Cost Engineering (10)

Core modules for flexible-modular students	
CEM10A	Research skills (20)
CEM10B	Research Dissertation (40)
CEM14A	Construction Cost Management Principles and Practice A (20)
CEM14B	Construction Cost Management Principles and Practice B (20)
CEM202	Construction Project Management (10)
CEM206	Construction Contract Law (10)
CEM228	Construction Economics (10)
CEM237	Basic Measurement Principles (0) *(Prereq. for CEM238)*
CEM238	Construction Cost Engineering (10)

Optional modules for all students: 40 credits from this list of optional modules[1]	
CEM203	Financial and Management Accounting in Construction (10)
CEM204	International Construction (10)
CEM205	Human Resources Management (10)
CEM210	People, Information and Technology (10)
CEM220	Urban Sustainability (10)
CEM225	Building Information Modelling (10)
CEM230	Design Management (10)
CEM242	Advanced Visualisation and Interactive Technologies (10)
CEM243	New Technology, Management and Change (10)
CEM244	Analysing Construction Processes (10)
CEM302	Strategic Management (10)
CEM303	Sustainable Design, Construction and Operation (10)
CEM335	Real Estate Development Analysis and Appraisal (10)

[1] One option may be chosen from the full list of 10-credit MSc optional modules available in the School.

Focus

The distinctive focus of this programme is on the principles, tools and techniques of financial and cost management from inception of a project, through to design and construction.

Construction and property cost consultancy is a thriving business activity which is seeking to recruit ambitious graduates from all disciplines who wish to enter a career in which they will develop in a climate of self-management and progress by making their own career choices. Property and construction cost consultants provide services to clients of the construction and property industries through the professional application of economic, financial, engineering, design, management and communication skills.

Flexible-modular students January entry

There will be an induction day for January starters at the beginning of the Spring Term. The CEM10A and CEM14A modules will start in September of the first year. CEM10B and CEM14B will run until Summer of the third year of study. Therefore, January starts require the period of study to run for at least three academic years, aiming to graduate in December of the third calendar year.

Programme timetable for Construction Cost Management (CC)

Code	Core modules	Dates	Term
	Welcome and Introduction	23–27 Sep 2019	Autumn
CEM104/14A	Construction Cost Mgmt: Principles and Practice	30 Sep–04 Oct 2019	Autumn
CEM202	Construction Project Management	08–12 Oct 2019	Autumn
CEM10A	Research Skills	04–08 Nov 2019	Autumn
CEM237	Basic Measurement Principles *(prereq. for CEM238)*	11–15 Nov 2019	Autumn
CEM206a	Construction Contract Law	09–14 Dec 2019	Autumn
CEM238	Construction Cost Engineering	03–07 Feb 2020	Spring
CEM228	Construction Economics	24–28 Feb 2020	Spring
	Optional modules (Four options from this list[1])		
CEM225	Building Information Modelling	21–25 Oct 2019	Autumn
CEM230	Design Management	18–22 Nov 2019	Autumn
CEM203	Financial and Mgmt Accounting in Construction	25–29 Nov 2019	Autumn
CEM242	Advanced Visualisation and Interactive Tech	02–06 Dec 2019	Autumn
CEM243	New technology, management and change	13–17 Jan 2020	Spring
CEM220	Urban Sustainability	20–24 Jan 2020	Spring
CEM205	Human Resource Management	27–31 Jan 2020	Spring
CEM335	Real Estate Development: Analysis and Appraisal	10–14 Feb 2020	Spring
CEM204	International Construction	17–21 Feb 2020	Spring
CEM210	People, Information and Technology	23–27 Mar 2020	Spring
CEM244	Analysing Construction Processes	20–24 Apr 2020	Summer
CEM303	Sustainable Design, Construction and Operation	27 Apr–01 May 2020	Summer
CEM302	Strategic Management	11–15 May 2020	Summer

Full-time programme: These dates are firm. Modules will only be moved for unavoidable operational reasons.

Flexible-modular programme: Modules for students on the flexible-modular programme will be spread over two years (up to a maximum of five). We aim to run modules at the same time each year, although this cannot be guaranteed. Please discuss the timing of your core and optional modules with your Programme Director.

[1] One option may be chosen from the full list of 10-credit MSc optional modules available in the School.

MSc Construction Management

Overview

MSc Construction Management engages with both project and company management, with distinct international dimensions. Study involves advanced case studies around topical issues, facilitated teamwork and an interesting programme of field trips and visits. Students graduating from this programme typically develop their careers in senior management positions in construction companies and the public sector all over the world. This programme is accredited by RICS and CIOB.

Core modules for full-time students	
CEM10A	Research Skills (20)
CEM10B	Research Dissertation (40)
CEM102	Business of Construction (40)
CEM202	Construction Project Management (10)
CEM204	International Construction (10)
CEM206	Construction Contract Law (10)
CEM209	Managing Construction (10)
CEM210	People, Information and Technology (10)

Core modules for flexible-modular students	
CEM10A	Research skills (20)
CEM10B	Research Dissertation (40)
CEM12A	Business of Construction A (20)
CEM12B	Business of Construction B (20)
CEM202	Construction Project Management (10)
CEM204	International Construction (10)
CEM206	Construction Contract Law (10)
CEM209	Managing Construction (10)
CEM210	People, Information and Technology (10)

Optional modules for all students: 30 credits from this list of optional modules[1]	
CEM203	Financial and Management Accounting in Construction (10)
CEM205	Human Resource Management (10)
CEM215	Infrastructure Development (10)
CEM216	International Construction Labour (10)
CEM217	Construction Sector Transition (10)
CEM220	Urban Sustainability (10)
CEM225	Building Information Modelling (10)
CEM228	Construction Economics (10)
CEM229	Green Building Assessment (10)
CEM230	Design Management (10)
CEM233	Urban Energy Systems (10)
CEM237	Basic Measurement Principles *(prereq. for CEM238)* (0)
CEM238	Construction Cost Engineering (10)
CEM242	Advanced Visualisation and Interactive Technologies (10)
CEM243	New Technology, Management and Change (10)
CEM244	Analysing Construction Processes (10)
CEM302	Strategic Management (10)
CEM303	Sustainable Design, Construction and Operation (10)
CEM319	Life Cycle Assessment (10)
CEM335	Real Estate Development: Analysis and Appraisal (10)

[1] One option may be chosen from the full list of 10-credit MSc optional modules available in the School.

Focus

The distinctive focus is on the management of the construction firm, including finance, organisation, project procurement, contracts for design and construction, information and communication technologies in the construction sector and the expectations of clients, developers, financiers and investors in a project.

The programme suits those who have an interest in pursuing a career in the management of construction, whether on the supply side or the demand side. Graduates with professional experience will find this programme provides a strong grounding for promotion to more senior management positions. Graduates without experience will find this programme an excellent way to gain mastery of the topics relating to management in construction.

Flexible-modular students January entry

There will be an induction day for January starters at the beginning of the Spring Term. The CEM10A and CEM12A modules will start in September of the first year. CEM10B and CEM12B will run until Summer of the third year of study. Therefore, January starts require the period of study to run for at least three academic years, aiming to graduate in December of the third calendar year.

Programme timetable for Construction Management (CM)

Code	Core modules	Dates	Term
	Welcome and Introduction	23–27 Sep 2019	Autumn
CEM102/12A	Business of Construction	30 Sep–04 Oct 2019	Autumn
CEM202	Construction Project Management	07–11 Oct 2019	Autumn
CEM209	Managing Construction	28 Oct –01 Nov 2019	Autumn
CEM10A	Research Skills	04–08 Nov 2019	Autumn
CEM204	International Construction	17–21 Feb 2020	Spring
CEM206b	Construction Contract Law	09–13 Mar 2020	Spring
CEM210	People, Information and Technology	23–27 Mar 2020	Spring
	Optional modules (Three options[1])		
CEM217	Construction Sector Transition	14–18 Oct 2019	Autumn
CEM225	Building Information Modelling	21–25 Oct 2019	Autumn
CEM237	Basic Measurement Principles *(prereq. for CEM238)*	11–15 Nov 2019	Autumn
CEM230	Design Management	18–22 Nov 2019	Autumn
CEM203	Financial and Mgmt Accounting in Construction	25–29 Nov 2019	Autumn
CEM242	Advanced Visualisation and Interactive Tech	02–06 Dec 2019	Autumn
CEM319	Life Cycle Assessment	09–13 Dec 2019	Autumn
CEM243	New technology, management and change	13–17 Jan 2020	Spring
CEM220	Urban Sustainability	20–24 Jan 2020	Spring
CEM205	Human Resource Management	27–31 Jan 2020	Spring
CEM238	Construction Cost Engineering	03–07 Feb 2020	Spring
CEM335	Real Estate Development: Analysis and Appraisal	10–14 Feb 2020	Spring
CEM228	Construction Economics	24–28 Feb 2020	Spring
CEM233	Urban Energy Systems	24–28 Feb 2020	Spring
CEM229	Green Building Assessment	02–06 Mar 2020	Spring
CEM216	International Construction Labour	16–20 Mar 2020	Spring
CEM303	Sustainable Design, Construction and Operation	27 Apr–01 May 2020	Summer
CEM244	Analysing Construction Processes	20–24 Apr 2020	Summer
CEM302	Strategic Management	27 Apr–01 May 2020	Summer
CEM215	Infrastructure Development	18–22 May 2020	Summer

Full-time programme: These dates are firm. Modules will only be moved for unavoidable operational reasons.

Flexible-modular programme: Modules for students on the flexible-modular programme will be spread over two years (up to a maximum of five). We aim to run modules at the same time each year, although this cannot be guaranteed. Please discuss the timing of your core and optional modules with your Programme Director.

Simultaneous optional modules: Please note that some modules take place in the same week. This means if you choose one of these you cannot choose the other.

[1] One option may be chosen from the full list of 10-credit MSc optional modules available in the School.

MSc Construction Management and International Development

Overview

MSc Construction Management and International Development is focused on countries undergoing rapid urbanisation, placing construction-related knowledge within the economic, social and developmental contexts in emerging economies. Case studies form a major part of the learning for this programme. They are based around the students' interests and provide opportunities to develop skills and knowledge relevant to the country or region in which they seek to develop their career. Supervised dissertation research takes place in parallel with the modules and this continues throughout the year of study. Students graduating from this programme will typically be employed by government and international agencies, the humanitarian sector and in private sector firms.

Core modules for full-time students	
CEM10A	Research Skills (20)
CEM10B	Research Dissertation (40)
CEM150	International Development in Construction (40)
CEM215	Infrastructure Development (10)
CEM216	International Construction Labour (10)
CEM217	Construction Sector Transition (10)
CEM220	Urban Sustainability (10)

Core modules for flexible-modular students	
CEM10A	Research Skills (20)
CEM10B	Research Dissertation (40)
CEM15A	International Development in Construction (20)
CEM15B	International Development in Construction (20)
CEM215	Infrastructure Development (10)
CEM216	International Construction Labour (10)
CEM217	Construction Sector Transition (10)
CEM220	Urban Sustainability (10)

Optional modules for all students: 40 credits from this list of optional modules[1]	
CEM202	Construction Project Management (10)
CEM203	Financial and Management Accounting in Construction (10)
CEM204	International Construction (10)
CEM205	Human Resource Management (10)
CEM206	Construction Contract Law (10)
CEM209	Managing Construction (10)
CEM210	People, Information and Technology (10)
CEM225	Building Information Modelling (10)
CEM228	Construction Economics (10)
CEM230	Design Management (10)
CEM243	New Technology, Management and Change (10)
CEM302	Strategic Management (10)
CEM303	Sustainable Design, Construction and Operation (10)
CEM335	Real Estate Development: Analysis & Appraisal (10)

[1] One option may be chosen from the full list of 10-credit MSc optional modules available in the School.

Focus

The distinctive focus is on countries undergoing rapid urbanisation, placing construction-related knowledge within the economic, social and developmental contexts in emerging economies.

The programme is aimed at early-to-mid -career professionals with an interest in the role of construction in emerging economies. The programme will appeal to those seeking to bring about practical changes in a range of different national contexts. It will also appeal to those working with international NGOs who require a better understanding of construction in a developmental context. The interdisciplinary character of our programmes matches the complexity of sustainable development.

Flexible-modular students January entry

There will be an induction day for January starters at the beginning of the Spring Term. The CEM10A and CEM15A modules will start in September of the first year. CEM10B and CEM15B will run until Summer of the third year of study. Therefore, January starts require the period of study to run for at least three academic years, aiming to graduate in December of the third calendar year.

Programme timetable for Construction Management and International Development (ID)

Code	Core modules	Dates	Term
	Welcome and Introduction	23–27 Sep 2019	Autumn
CEM150/A	International Development in Construction	30 Sep–04 Oct 2019	Autumn
CEM217	Construction Sector Transition	14–18 Oct 2019	Autumn
CEM10A	Research Skills	04–08 Nov 2019	Autumn
CEM220	Urban Sustainability	20–24 Jan 2020	Spring
CEM216	International Construction Labour	16–20 Mar 2020	Spring
CEM215	Infrastructure Development	18–20 May 2020	Summer
	Optional modules (Four options[1])		
CEM225	Building Information Modelling	21–25 Oct 2019	Autumn
CEM209	Managing Construction	28 Oct–01 Nov 2019	Autumn
CEM230	Design Management	18–22 Nov 2019	Autumn
CEM203	Financial and Mgmt Accounting in Construction	25–29 Nov 2019	Autumn
CEM243	New technology, management and change	13–17 Jan 2020	Spring
CEM205	Human Resource Management	27–31 Jan 2020	Spring
CEM335	Real Estate Development: Analysis and Appraisal	10–14 Feb 2020	Spring
CEM204	International Construction	17–21 Feb 2020	Spring
CEM228	Construction Economics	24–28 Feb 2020	Spring
CEM206b	Construction Contract Law	09–13 Mar 2020	Spring
CEM210	People, Information and Technology	23–27 Mar 2020	Spring
CEM303	Sustainable Design, Construction and Operation	27 Apr–01 May 2020	Summer
CEM302	Strategic Management	11–15 May 2020	Summer

Full-time programme: These dates are firm. Modules will only be moved for unavoidable operational reasons.
Flexible-modular programme: Modules for students on the flexible-modular programme will be spread over two years (up to a maximum of five). Please discuss the timing of your core and optional modules with your Programme Director.

[1] One option may be chosen from the full list of 10-credit MSc optional modules available in the School.

MSc Design and Management of Sustainable Built Environments

Overview

MSc Design and Management of Sustainable Built Environments is for candidates who wish to gain a broad interdisciplinary knowledge and an advanced understanding of the key subjects in both the design and operation stages of sustainable buildings and cities. The programme is run in association with the major UK Architecture and Building Engineering companies. Students graduating from this programme will typically develop their career in a technical leadership position, driving forward the sustainability agenda in the areas of architectural design, environmental engineering, facilities management, building energy operation and green building assessment.

Core modules for full-time students	
CEM18A	Engineering Research Skills (20)
CEM18B	Engineering Research Dissertation (40)
CEM107	SDM Principles and Practice (40)
CEM220	Urban Sustainability (10)
CEM221	Energy in Buildings (10)
CEM223	Urban Microclimates (10)
CEM225	Building Information Modelling (10)
CEM226	ICT and Energy Management (10)
CEM229	Green Building Assessment (10)

Core modules for flexible-modular students	
CEM18A	Engineering Research Skills (20)
CEM18B	Engineering Research Dissertation (40)
CEM17A	SDM Principles and Practice A (20)
CEM17B	SDM Principles and Practice B (20)
CEM220	Urban Sustainability (10)
CEM221	Energy in Buildings (10)
CEM223	Urban Microclimates (10)
CEM225	Building Information Modelling (10)
CEM226	ICT and Energy Management (10)
CEM229	Green Building Assessment (10)

Optional modules for all students: 20 credits from this list of optional modules[1]	
CEM224	Carbon Management (10)
CEM235	Engineering Project Management (10)
CEM242	Advanced Visualisation and Interactive Technologies (10)
CEM243	New Technology, Management and Change (10)
CEM319	Life Cycle Assessment (10)

[1] One option may be chosen from the full list of 10-credit MSc optional modules available in the School.

Focus

The distinctive focus is on a truly interdisciplinary approach to the design and operation of sustainable buildings and cities.

The aim of the programme is to provide a coherent framework for the discipline and practice of design and management. Each module includes sessions delivered by leading practitioners. The programme is continually informed not only by the latest developments in industry, but also by on-going international research. It is ideal for professionals in the built environment including urban planners, architects, building services engineers, facilities managers and performance assessors. The challenges include fragmentation of disciplines in built environments. We aim to prepare professionals to address these challenges through the acquisition of key practical skills of analysis and simulation in technical issues in environmental design, engineering and management.

Flexible-modular students January entry

There will be an induction day for January starters at the beginning of the Spring Term. The CEM18A and CEM17A modules will start in September of the first year. CEM18B and CEM17B will run until Summer of the third year of study. Therefore, January starts require the period of study to run for at least three academic years, aiming to graduate in December of the third calendar year.

Programme timetable for Design and Management of Sustainable Built Environments (DM)

Code	Core modules	Dates	Term
	Welcome and Introduction	23–27 Sep 2019	Autumn
CEM107/17A	SDM Principles and Practice[1,2]	} 30 Sep–04 Oct 2019	Autumn
CEM18A	Engineering Research Skills[1,2]		
CEM225	Building Information Modelling	21–25 Oct 2019	Autumn
CEM223	Urban Microclimates	04-08 Nov 2019	Autumn
CEM226	ICT and Energy Management	18–22 Nov 2019	Autumn
CEM107/17A	SDM Principles and Practice[2]	} 25–29 Nov 2019	Autumn
CEM18A	Engineering Research Skills[1,2]		
CEM220	Urban Sustainability	20–24 Jan 2020	Spring
CEM107/17A	SDM Principles and Practice[3,4]	} 27–31 Jan 2020	Spring
CEM18A	Engineering Research Skills[1,2]		
CEM221	Energy in Buildings	10–14 Feb 2020	Spring
CEM107/17A	SDM Principles and Practice[2]	17–21 Feb 2020	Spring
CEM229	Management	02–06 Mar 2020	Spring
CEM107/17A	SDM Principles and Practice[1,2]	} 23–27 Mar 2020	Spring
CEM18A	Engineering Research Skills[1,2]		
CEM221	Examinations (CEM221)	20–24 Apr 2020	Summer
	Optional modules (Two options from this list[5])		
CEM242	Advanced Visualisation and Interactive Tech	02–06 Dec 2019	Autumn
CEM319	Life Cycle Assessment	09–13 Dec 2019	Autumn
CEM243	New technology, management and change	13–17 Jan 2020	Spring
CEM224	Carbon Management	03–07 Feb 2020	Spring
CEM235	Engineering Project Management	17–21 Mar 2020	Spring

Full-time programme: These dates are firm. Modules will only be moved for unavoidable operational reasons.

Flexible-modular programme: Modules for students on the flexible-modular programme will be spread over two years (up to a maximum of five). We aim to run modules at the same time each year, although this cannot be guaranteed. Please discuss the timing of your core and optional modules with your Programme Director.

CEM107/17A and CEM18A: Please note that the teaching for these modules is spread over more than one week. You must attend all of those weeks in the sequence shown. They are not optional.

[1] Part of a week completed by another module.

[2] Part of a module that occurs in more than one week. Please note, all such weeks must be completed in the same academic year; these are not optional weeks.

[3] Part of a week completed by another module.

[4] Part of a module that occurs in more than one week. Please note, all such weeks must be completed in the same academic year; these are not optional weeks.

[5] One option may be chosen from the full list of 10-credit MSc optional modules available in the School.

MSc Information Management for Design Construction and Operation

Overview

MSc Information Management for Design, Construction and Operation is focused on developing specialist expertise and skills in building information modelling and in the use and implementation of information management systems, tools and processes in architecture, engineering, construction and operations. Graduates will be ideally placed to be employed in construction information management, BIM and CAD management, design management, document management etc. Graduates may also follow careers in a wide range of traditional construction-related vocations such as architectural and engineering design, project management, construction management, general business management, and in the public sector or client organisations.

Core modules for full-time students	
CEM10A	Research Skills (20)
CEM10B	Research Dissertation (40)
CEM110	Collaboration Practice and Innovation (40)
CEM210	People, Information and Technology (10)
CEM225	Building Information Modelling (10)
CEM242	Advanced Visualisation and Interactive Technologies (10)
CEM243	New Technology Management and Change (10)
CEM244	Analysing Construction Processes (10)

Core modules for flexible-modular students	
CEM10A	Research Skills (20)
CEM10B	Research Dissertation (40)
CEM11A	Collaboration Practice and Innovation A (20)
CEM11B	Collaboration Practice and Innovation B (20)
CEM210	People, Information and Technology (10)
CEM225	Building Information Modelling (10)
CEM242	Advanced Visualisation and Interactive Technologies (10)
CEM243	New Technology Management and Change (10)
CEM244	Analysing Construction Processes (10)

Optional modules for all students: 20 credits from this list of optional modules[1]	
CEM201	Introduction to Project Management (10)
CEM203	Financial and Management Accounting in Construction (10)
CEM204	International Construction (10)
CEM205	Human resource management (10)
CEM206	Construction Contract Law (10)
CEM209	Managing Construction (10)
CEM217	Construction Sector Transition (10)
CEM228	Construction Economics (10)
CEM230	Design Management (10)
CEM233	Urban Energy Systems (10)
CEM235	Engineering Project Management (10)
CEM237	Basic Measurement Principles (0) *(Prereq for CEM238)*
CEM238	Construction Cost Engineering (10)
CEM302	Strategic Management (10)
CEM303	Sustainable Design, Construction and Operation (10)
CEM335	Real estate Development: Analysis and Appraisal (10)

[1] One option may be chosen from the full list of 10-credit MSc optional modules available in the School.

Focus

The distinctive focus is on the implementation and use of digital technologies in the construction sector. Clients, both public and private, expect integrated and meaningful information to be delivered alongside the physical product. Built environment professionals need to be able to understand information requirements across the life cycle, to develop and implement project and organisational level information management processes, and to manage a diverse range of data and interfaces through the construction process.

Flexible-modular students January entry

There will be an induction day for January starters at the beginning of the Spring Term. The CEM10A and CEM11A modules will start in September of the first year. CEM10B and CEM11B will run until Summer of the third year of study. Therefore, January starts require the period of study to run for at least three academic years, aiming to graduate in December of the third calendar year.

Programme timetable for Information Management for Design, Construction and Operation (IM)

Code	Core modules	Dates	Term
	Welcome and Introduction	23–27 Sep 2019	Autumn
CEM110/A	Collaboration Practice and Innovation	30 Sep–04 Oct 2019	Autumn
CEM225	Building Information Modelling	21–26 Oct 2019	Autumn
CEM10A	Dissertation and Research Skills	04–08 Nov 2019	Autumn
CEM242	Advanced Visualisation	02–06 Dec 2019	Autumn
CEM243	New technology, management and change	13–17 Jan 2020	Spring
CEM210	People, Information and Technology	23–27 Mar 2020	Spring
CEM244	Analysing Construction Processes	20–24 Apr 2020	Summer
	Optional modules (Three options[1])		
CEM201	An Introduction to Project Management	14–18 Oct 2019	Autumn
CEM217	Construction Sector Transition	14–18 Oct 2019	Autumn
CEM209	Managing Construction	28 Oct–01 Nov 2019	Autumn
CEM237	Basic Measurement Principles *(Prereq. for CEM238)*	11–15 Nov 2019	Autumn
CEM230	Design Management	18–22 Nov 2019	Autumn
CEM203	Financial and Mgmt Accounting in Construction	25–29 Nov 2019	Autumn
CEM205	Human Resource Management	27–31 Jan 2020	Spring
CEM238	Construction Cost Engineering	03–07 Feb 2020	Spring
CEM335	Real Estate Development: Analysis and Appraisal	10–14 Feb 2020	Spring
CEM204	International Construction	17–21 Feb 2020	Spring
CEM228	Construction Economics	24–28 Feb 2020	Spring
CEM233	Urban Energy Systems	24–28 Feb 2020	Spring
CEM206b	Construction Contract Law	09–13 Mar 2020	Spring
CEM235	Engineering Project Management	16–20 Mar 2020	Spring
CEM303	Sustainable Design, Construction and Operation	27 Apr–01 May 2020	Summer
CEM302	Strategic Management	11–15 May 2020	Summer

Full-time programme: These dates are firm. Modules will only be moved for unavoidable operational reasons.

Flexible-modular programme: Modules for students on the flexible-modular programme will be spread over two years (up to a maximum of five). Please discuss the timing of your core and optional modules with your Programme Director.

Simultaneous optional modules: Please note that some modules take place in the same week. This means if you choose one of these you cannot choose the other.

[1] One option may be chosen from the full list of 10-credit MSc optional modules available in the School.

MSc Project Management

Overview

MSc Project Management focuses on the strategic management of projects, programmes and portfolios. Students graduating from this programme typically develop their careers in senior leadership positions in construction and other project-based organisations with responsibilities for developing integrated approaches to organising teams around projects, programmes and portfolios. This programme is accredited by RICS, CIOB and APM.

Core modules for full-time students	
CEM10A	Research Skills (20)
CEM10B	Research Dissertation (40)
CEM103	Principles and Practice of Project Management (40)
CEM201	Introduction to Project Management (10)
CEM205	Human Resource Management (10)
CEM206	Construction Contract Law (10)
CEM230	Design Management (10)

Core modules for flexible-modular students	
CEM10A	Research Skills (20)
CEM10B	Research Dissertation (40)
CEM13A	Principles and Practice of Project Management A (20)
CEM13B	Principles and Practice of Project Management B (20)
CEM201	Introduction to Project Management (10)
CEM205	Human Resource Management (10)
CEM206	Construction Contract Law (10)
CEM230	Design Management (10)

Optional modules for all students: 40 credits from this list of optional modules	
CEM203	Financial and Management Accounting in Construction (10)
CEM204	International Construction (10)
CEM210	People, Information and Technology (10)
CEM220	Urban Sustainability (10)
CEM225	Building Information Modelling (10)
CEM228	Construction Economics (10)
CEM229	Green Building Assessment (10)
CEM237	Basic Measurement Principles (0) (*Prereq. for CEM238*)
CEM238	Construction Cost Engineering (10)
CEM242	Advanced Visualisation and Interactive Technologies (10)
CEM243	New Technology, Management and Change (10)
CEM244	Analysing Construction Processes (10)
CEM302	Strategic Management (10)
CEM303	Sustainable Design, Construction and Operation (10)
CEM335	Real estate Development: Analysis and Appraisal (10)

Focus

The distinctive focus is on the strategic management of projects, programmes and portfolios.

The aim of the programme is to provide a coherent framework for the discipline and practice of project management. Each module includes sessions delivered by leading practitioners. The programme is continually informed not only by the latest developments in industry, but also by on-going international research. A recurring theme throughout the programme concerns the dynamic nature of construction projects. Not only is it necessary to set clear objectives at the beginning of a project, it is also important to update them continually as the project unfolds. A further theme is the need for project managers to provide leadership. This requires a high level of interpersonal skills to motivate diverse team members towards the realisation of project success. Effective project management requires a sound knowledge of tools and techniques. It also requires an ability to think strategically. Traditional notions of command and control must be matched with an ability to manage 'soft' issues. People management is central to the art of project management.

Flexible-modular students January entry

There will be an induction day for January starters at the beginning of the Spring Term. The CEM10A and CEM13A modules will start in September of the first year. CEM10B and CEM13B will run until Summer of the third year of study. January starts involve spreading the period of study over three academic years, with a view to graduating in December of the third year.

Programme Timetable for Project Management (PM)

Code	Core modules	Dates	Term
	Welcome and Introduction	23–27 Sep 2019	Autumn
CEM103/13A	Project Management: Principles and Practice	30 Sep–04 Oct 2019	Autumn
CEM201	An Introduction to Project Management	14–18 Oct 2019	Autumn
CEM10A	Research Skills	04–08 Nov 2019	Autumn
CEM230	Design Management	18–22 Nov 2019	Autumn
CEM205	Human Resource Management	27–31 Jan 2020	Spring
CEM206b	Construction Contract Law	09–13 Mar 2020	Spring
	Optional modules (Four options from this list only)		
CEM225	Building Information Modelling	21–25 Oct 2019	Autumn
CEM237	Basic Measurement Principles *(prereq. for CEM238)*	11–15 Nov 2019	Autumn
CEM203	Financial and Mgmt Accounting in Construction	25–29 Nov 2019	Autumn
CEM242	Advanced Visualisation and Interactive Tech	02–06 Dec 2019	Autumn
CEM243	New technology, management and change	13–17 Jan 2020	Spring
CEM220	Urban Sustainability	20–24 Jan 2020	Spring
CEM238	Construction Cost Engineering	03–07 Feb 2020	Spring
CEM335	Real Estate Development: Analysis and Appraisal	10–14 Feb 2020	Spring
CEM204	International Construction	17–21 Feb 2020	Spring
CEM228	Construction Economics	24–28 Feb 2020	Spring
CEM229	Green Building Assessment	02–06 Mar 2020	Spring
CEM210	People, Information and Technology	23–27 Mar 2020	Spring
CEM244	Analysing Construction Processes	20–24 Apr 2020	Summer
CEM303	Sustainable Design, Construction and Operation	27 Apr–01 May 2020	Summer
CEM302	Strategic Management	11–15 May 2020	Summer

Full-time programme: These dates are firm. Modules will only be moved for unavoidable operational reasons.
Flexible-modular programme: Modules for students on the flexible-modular programme will be spread over two years (up to a maximum of five). Please discuss the timing of your core and optional modules with your Programme Director.
Simultaneous optional modules: Please note that some modules take place in the same week. This means if you choose one of these you cannot choose the other.

MSc Renewable Energy: Technology and Sustainability

Overview

MSc in Renewable Energy: Technology and Sustainability provides students with an understanding of renewable energy and sustainable technologies, as well as carbon management and energy use in the built environment. The programme covers rapidly evolving fields that are vitally relevant to how society develops in the 21st Century. Supervised dissertation research takes place during the last four months of the programme. Students graduating from this programme will typically be employed by the energy industry, consultancies, local government and various private sector companies.

Core modules for full-time students	
CEM19A	Energy Research Skills (20)
CEM19B	Energy Research Dissertation (40)
CEM160	Renewable Energy Systems (40)
CEM224	Carbon Management (10)
CEM233	Urban Energy Systems (10)
CEM241	Energy and the Environment (10)
CEM235	Engineering Project Management (10)

Core modules for flexible-modular students	
CEM19A	Energy Research Skills (20)
CEM19B	Energy Research Dissertation (40)
CEM16A	Renewable Energy Systems A (20)
CEM16B	Renewable Energy Systems A (20)
CEM224	Carbon Management (10)
CEM233	Urban Energy Systems (10)
CEM241	Energy and the Environment (10)
CEM235	Engineering Project Management (10)

Optional modules for all students: 40 credits from this list of optional modules[1]	
CEM220	Urban Sustainability (10)
CEM221	Energy in Buildings (10)
CEM222	Building Simulation (10)
CEM223	Urban Microclimates (10)
CEM225	Building Information Modelling (10)
CEM226	ICT and Energy Management (10)
CEM229	Green Building Assessment (10)
CEM242	Advanced Visualisation and Interactive Technologies (10)
CEM319	Life Cycle Assessment (10)

[1] One option may be chosen from the full list of 10-credit MSc optional modules available in the School.

Focus

The distinctive focus is on renewable energy and sustainable technologies, as well as carbon management and energy use in the built environment.

There is international concern about the environmental damage associated with the conversion of energy from all sources. Renewable energy sources can make a significant contribution to the reduction of pollution, if used in a sustainable way. Renewable fuels and energy systems can also offer protection against future shortages and price increases of conventional energy and can provide energy supplies in remote areas.

Flexible-modular students January entry

There will be an induction day for January starters at the beginning of the Spring Term. Our expectation is that CEM109 will start in September of the first year and run until Summer of the third year of study. January starts involve spreading the period of study over three academic years, with a view to graduating in December of the third year.

Programme Timetable for Renewable Energy: Technology and Sustainability (RE)

Code	Core modules	Dates	Term
	Welcome and Introduction	23–27 Sep 2019	Autumn
CEM241	Energy and the Environment	30 Sep–04 Oct 2019	Autumn
CEM109/19A	Energy Research Skills	07–11 Oct 2019	Autumn
CEM160/A/B	Renewable Energy Systems[1]	14–18 Oct 2019	Autumn
CEM160/A/B	Renewable Energy Systems [1]	28 Oct–01 Nov 2019	Autumn
CEM160/A/B	Renewable Energy Systems [1]	11–15 Nov 2019	Autumn
CEM160/A/B	Renewable Energy Systems [1]	27 Jan–01 May 2020	Spring
CEM224	Carbon Management	03–07 Feb 2020	Spring
CEM233	Urban Energy Systems	24–28 Feb 2020	Spring
CEM235	Engineering Project Management	16–20 Mar 2020	Spring
	Optional modules (Four options[2])		
CEM225	Building Information Modelling	21–25 Oct 2019	Autumn
CEM223	Urban Microclimates	04-08 Nov 2019	Autumn
CEM226	ICT and Energy Management	18–22 Nov 2019	Autumn
CEM242	Advanced Visualisation and Interactive Tech	02–06 Dec 2019	Autumn
CEM319	Life Cycle Assessment	09–13 Dec 2019	Summer
CEM220	Urban Sustainability	20–24 Jan 2020	Spring
CEM221	Energy in Buildings	10–14 Feb 2020	Spring
CEM222	Building Simulation	17–21 Feb 2020	Spring
CEM229	Green Building Assessment	02–06 Mar 2020	Spring
CEM221	Examinations	20–24 Apr 2020	Summer

Full-time programme: These dates are firm.

Flexible-modular programme: Modules for students on the flexible-modular programme will be spread over two years (up to a maximum of five). CEM109 will be studied over two consecutive years, without a break, with classes only in the first year of the modules. We aim to run modules at the same time each year, although this cannot be guaranteed. Please discuss the timing of your core and optional modules with your Programme Director.

CEM16A and CEM16B: Please note that the teaching for this module is spread over more than one week. You must attend all such weeks in the sequence shown. They are not optional.

[1] Part of a module that occurs in more than one week. Please note, all such weeks must be completed in the same academic year; these are not optional weeks.

[2] One option may be chosen from the full list of 10-credit MSc optional modules available in the School.

Allocation of 20 and 40-credit modules to programmes

(C = core; o = Optional; - = Excluded)

Code	Title	*	CC	CM	DM	ID	IM	PM	RE
CEM10A	Research Skills (20)		C	C	-	C	C	C	-
CEM10B	Research Dissertation (40)		C	C	-	C	C	C	-
CEM102	Business of Construction (40)	F	-	C	-	-	-	-	-
CEM12A	Business of Construction A (20)	M	-	C	-	-	-	-	-
CEM12B	Business of Construction B (20)	M	-	C	-	-	-	-	-
CEM103	Principles and Practice of Project Mgmt. (40)	F	-	-	-	-	-	C	-
CEM13A	Principles and Practice of Project Mgmt. A (20)	M	-	-	-	-	-	C	-
CEM13B	Principles and Practice of Project Mgmt. B (20)	M	-	-	-	-	-	C	-
CEM104	CCM Principles and Practice (40)	F	C	-	-	-	-	-	-
CEM14A	CCM Principles and Practice A (20)	M	C	-	-	-	-	-	-
CEM14B	CCM Principles and Practice B (20)	M	C	-	-	-	-	-	-
CEM150	International Development in Construction (40)	F	-	-	-	C	-	-	-
CEM15A	International Development in Construction A (20)	M	-	-	-	C	-	-	-
CEM15B	International Development in Construction B (20)	M	-	-	-	C	-	-	-
CEM160	Renewable Energy Systems (40)	F	-	-	-	-	-	-	C
CEM16A	Renewable Energy Systems A (20)	M	-	-	-	-	-	-	C
CEM16B	Renewable Energy Systems B (20)	M	-	-	-	-	-	-	C
CEM107	SDM Principles and Practice (40)	F	-	-	C	-	-	-	-
CEM17A	SDM Principles and Practice A (20)	M	-	-	C	-	-	-	-
CEM17B	SDM Principles and Practice B (20)	M	-	-	C	-	-	-	-
CEM18A	Engineering Research Skills (20)	M	-	-	C	-	-	-	-
CEM18B	Engineering Research Dissertation (40)	M	-	-	C	-	-	-	-
CEM19A	Energy Research Skills (20)	M	-	-	-	-	-	-	C
CEM19B	Energy Research Dissertation (40)	M	-	-	-	-	-	-	C
CEM110	Collaboration Practice and Innovation (40)	F	-	-	-	-	C	-	-
CEM11A	Collaboration Practice and Innovation A (20)	M	-	-	-	-	C	-	-
CEM11B	Collaboration Practice and Innovation B (20)	M	-	-	-	-	C	-	-

* Mode of study: Blank=Both, M=Flexible-Modular only, F=Full-time only

Allocation of 10-credit modules to programmes

(C = core; o = Optional; - = Excluded)

Code	Title	CC	CM	DM	ID	IM	PM	RE
CEM201	Introduction to Project Management (10)	-	-	-	-	o	C	-
CEM202	Construction Project Management (10)	C	C	-	o	-	-	-
CEM203	Financial and Management Accounting in Const. (10)	o	o	-	o	o	o	-
CEM204	International Construction (10)	o	C	-	o	o	o	-
CEM205	Human Resource Management (10)	o	o	-	o	o	C	-
CEM206	Construction Contract Law (10)	C	C	-	o	o	C	-
CEM209	Managing Construction (10)	-	C	-	o	o	-	-
CEM210	People, Information and Technology (10)	o	C	-	o	C	o	-
CEM215	Infrastructure Development (10)	-	o	-	C	-	-	-
CEM216	International Construction Labour (10)	-	o	-	C	-	-	-
CEM217	Construction Sector Transition (10)	-	o	-	C	o	-	-
CEM220	Urban Sustainability (10)	o	o	C	C	-	o	o
CEM221	Energy in Buildings (10)	-	-	C	-	-	-	o
CEM222	Building Simulation (10)	-	-	-	-	-	-	o
CEM223	Urban Microclimates (10)	-	-	C	-	-	-	o
CEM224	Carbon Management (10)	-	-	o	-	-	-	C
CEM225	Building Information Modelling (10)	o	o	C	o	C	o	o
CEM226	ICT and Energy Management (10)	-	-	C	-	-	-	o
CEM228	Construction Economics (10)	C	o	-	o	o	o	-
CEM229	Green Building Assessment (10)	-	o	C	-	-	o	o
CEM230	Design Management (10)	o	o	-	o	o	C	-
CEM233	Urban Energy Systems (10)	-	o	-	-	o	-	C
CEM235	Engineering Project Management (10)	-	-	o	-	o	-	C
CEM237	Basic Measurement Principles (0) *(Prereq. for CEM238)*	C	o	-	-	o	o	-
CEM238	Construction Cost Engineering (10)	C	o	-	-	o	o	-
CEM241	Energy and the Environment (10)	-	-	-	-	-	-	C
CEM242	Advanced Visualisation and Interactive Tech. (10)	o	o	o	-	C	o	-
CEM243	New Technology, Management and Change (10)	o	o	o	o	C	o	-
CEM244	Analysing Construction Processes (10)	o	o	-	-	C	o	-
CEM302	Strategic Management (10)	o	o	-	o	o	o	-
CEM303	Sustainable Design, Construction and Operation (10)	o	o	-	o	o	o	-
CEM319	Life Cycle Assessment (10)	-	o	o	-	-	-	o
CEM335	Real estate Development: Analysis & Appraisal (10)	o	o	-	o	o	o	-

Module summaries

Throughout this section, the number in brackets next to each module name represents the number of credits in that module. A total of 180 credits is needed for an MSc. For each module, a basic description and the aims are provided, along with a single reading per module that is intended to characterize what the module is about. In many cases this is *not* the set textbook, simply an example that helps to illustrate the focus of the module.

CEM10A Research Skills (20)

Convenor: Dr Libby Schweber

Description: Students are provided with research skills lectures and workshops to support their dissertation research and writing on a topic of their choice.

Aims: The aim is to equip students with the necessary understanding, knowledge and skills to formulate research problems, develop and apply appropriate investigative approaches, interpret data and present findings. The knowledge and skills developed will provide broad-based support for students to engage in reflexive scholarship in all their taught modules. This module has a specific emphasis on preparing students to prepare a research proposal for their dissertation.

Fellows, R.F. and Liu, A.M.M. (2015) *Research Methods for Construction*, 4th ed. Wiley-Blackwell, Chichester.

CEM10B Research Dissertation (40)

Convenor: Dr Libby Schweber

Description: Students are provided with research skills classes and academic supervision to support their dissertation research and writing on a topic of their choice.

Aims: The aim is equip students with the necessary understanding, knowledge and skills to produce a dissertation including all parts of a research project.

Rudestam, K.E. and Newton, R.R. (2014) *Surviving your dissertation: a comprehensive guide to content and process*. Sage, London.

CEM102 Business of Construction (40)
CEM12A Business of Construction A (20)
CEM12B Business of Construction B (20)

Convenor: Prof Will Hughes

Description: This is the key integrating module for the MSc Construction Management programme. It is based on the idea of integrating learning from core programme modules into a personal, coherent view of the discipline of construction management. We will investigate the diverse perspectives that different modules bring to the study of construction management through two continuous pieces of work running in parallel throughout the programme. First, through the use of reflective writing based on observations of practice

and lessons from core modules connected to a recognized professional skills framework. Second, the application of learning from core modules to a case study building project.

Please note that there are three matching module description forms: CEM102, CEM12A and CEM12B. This is because the A and B versions are the flexible-modular equivalent of the full-time version. The flexible-modular equivalent runs over two years. The only difference between full-time and flexible-modular in relation to assessment is that the assignments for the 40-credit version are split across two years for flexible-modular students in two 20-credit versions. The differences in contact hours for these modules relate to the class contact hours.

Aims: The aim is to explore the changing nature of knowledge and practice in the management of construction projects and the environments in which they are undertaken. These changes bring new opportunities and new challenges for construction managers. We seek to apply the lessons from the core modules to a case study project and also to empower students to have ownership of their own professional development through reflective writing. This involves reflections on translating theory into practice and provides an opportunity for students to understand their own learning

Osterwalder, A. and Pigneur, Y. (2010) *Business model generation: a handbook for visionaries, game changers, and challengers*. Wiley, Hoboken NJ.

CEM103 Principles and Practice of Project Management (40)
CEM13A Principles and Practice of Project Management A (20)
CEM13B Principles and Practice of Project Management B (20)

Convenor: Dr Shu-Ling Lu

Description: This is the key integration module for the MSc Project Management programme. A series of exercises and case studies will be undertaken to explore and integrate the application of related programme modules, in particular the four core 10-credit programme modules.

Please note that there are three matching module description forms: CEM103 Principles and Practice of Project Management, CEM13A Principles and Practice of Project Management A and CEM13B Principles and Practice of Project Management B. This is because the A and B versions are the flexible-modular equivalent of the full-time version. The flexible-modular equivalent runs over two years. The only difference between full-time and flexible-modular in relation to assessment is that the assignments for the 40-credit version are split across two years for flexible-modular students in two 20-credit versions. The differences in contact hours for these modules relate to the class contact hours.

Aims: The aims are to explore the changing nature of knowledge and practice in the management of project environments and construction organisations (e.g. new procurement methods) and how these changes bring new opportunities and new challenges for project managers.

Chartered Institute of Building (2014) *Code of practice for project management for construction and development*. Wiley-Blackwell, Chichester.

CEM104 Construction Cost Management Principles and Practice (40)
CEM14A Construction Cost Management Principles and Practice (20)
CEM14B Construction Cost Management Principles and Practice (20)

Convenor: Dr Florence Phua

Description: This is the key integrating module for the MSc Construction Cost Management programme. It is based on the idea of integrating learning from core programme modules into a personal, coherent view of the discipline of construction management. We will investigate the diverse perspectives that different modules bring to the study of construction management through two continuous pieces of work running in parallel throughout the programme. First, through the use of reflective writing based on observations of practice and lessons from core modules connected to a recognised professional skills framework. Second, the application of learning from core modules to a case study building project.

Please note that there are three matching module description forms: CEM104, CEM14A and CEM14B. This is because the A and B versions are the flexible-modular equivalent of the full-time version. The flexible-modular equivalent runs over two years. The only difference between full-time and flexible-modular in relation to assessment is that the assignments for the 40-credit version are split across two years for flexible-modular students in two 20-credit versions. The differences in contact hours for these modules relate to the class contact hours.

Aims: The aim is to explore the changing nature of knowledge and practice in the cost management of construction development projects and the environments in which they are undertaken. These changes bring new opportunities and new challenges for construction cost managers. We seek to apply the lessons from the core modules to a case study project and also to empower students to have ownership of their own professional development through reflective writing. This involves reflections on translating theory into practice and provides an opportunity for students to understand their own learning.

Kirkham, R.J., Brandon, P.S., and Ferry, D.J. (2015) *Ferry and Brandon's cost planning of buildings.* Wiley-Blackwell, London.

CEM150 International Development in Construction (40)
CEM15A International Development in Construction (20)
CEM15B International Development in Construction (20)

Convenor: Dr Tabarak Ballal

Description: This is the key integrating module for the MSc Construction Management and International Development programme. It is based on the idea of integrating learning from core programme modules into a personal, coherent view of international development in construction. We will investigate the diverse perspectives that different modules bring to this study through two continuous pieces of work running in parallel throughout the programme. First, through the use of reflective writing based on observations of practice and lessons from core modules connected to a recognised professional skills framework. Second, the application of learning from core modules to a case study that explores specific issues in one geographical location of your choice, usually your home country.

Please note that there are three matching module description forms: CEM150, CEM15A and CEM15B. This is because the A and B versions are the flexible-modular equivalent of the full-time version. The flexible-modular equivalent runs over two years. The only difference between full-time and flexible-modular in relation to assessment is that the assignments for the 40-credit version are split across two years for flexible-modular students in two 20-credit versions. The differences in contact hours for these modules relate to the class contact hours.

Aims: The aim is to explore the changing nature of knowledge and practice in the management, policy and environment of the construction sector in relation to international development. These changes bring new opportunities and new challenges for the construction sector. We seek to apply the lessons from the core modules to a case study of one location and also to empower students to have ownership of their own professional development through reflective writing. This involves reflections on translating theory into practice and provides an opportunity for students to understand their own learning.

Ofori, G. (2012) *New perspectives on construction in developing countries*. Spon Press, London.

CEM160 Renewable Energy Systems (40)

Convenor: Dr Maria Vahdati

Description: This module is concerned with renewable energy technologies. These include biomass, solar, wind, hydro and marine energy. Technical, environmental and social issues are considered. Technical and non-technical barriers and issues limiting wide spread use of renewable energy are discussed. Assessment through laboratory work, use of energy software and group activities gives students an opportunity to examine and analyse data as well as to investigate issues concerned with the use of renewable energy.

Aims: To provide the student with a knowledge of the technical, environmental and social issues associated with a range of renewable energy technologies.

Twidell, J. and Weir, T. (2015) *Renewable energy resources*. Routledge, London.

CEM16A Renewable Energy Systems A (20)

Convenor: Dr Maria Vahdati

Description: This module is concerned with renewable energy technologies. In CEM16A, these include two of the following technologies: biomass, solar, wind and hydro (including marine energy). Technical, environmental and social issues are considered. Technical and non-technical barriers and issues limiting widespread use of renewable energy are discussed. Assessment through laboratory work, use of energy software and group activities give students an opportunity to examine and analyse data as well as to investigate issues concerned with the use of renewable energy.

Aims: To provide the student with a knowledge of the technical, environmental and social issues associated with a range of renewable energy technologies.

Twidell, J. and Weir, T. (2015) *Renewable energy resources*. Routledge, London.

CEM16B Renewable Energy Systems B (20)

Convenor: Dr Maria Vahdati

Description: This module is concerned with renewable energy technologies. In CEM16B, these include two of the following technologies: biomass, solar, wind and hydro (including marine energy). Technical, environmental and social issues are considered. Technical and non-technical barriers and issues limiting widespread use of renewable energy are discussed. Assessment through laboratory work, use of energy software and group activities give students an opportunity to examine and analyse data as well as to investigate issues concerned with the use of renewable energy.

Aims: To provide the student with a knowledge of the technical, environmental and social issues associated with a range of renewable energy technologies.

Twidell, J. and Weir, T. (2015) *Renewable energy resources*. Routledge, London.

CEM107 SDM Principles and Practice (40)

Convenor: Prof Runming Yao

Description: This module provides the knowledge and understanding necessary for students to assess building passive and active systems in terms of their environmental performance and impact. The module will introduce the role of building site impact, building façade design, building services engineering systems, construction materials, facilities management and system controls in moderating the internal building environment and an understanding of the energy implications for each. Building users' need will also be addressed. The module will provide knowledge of heat transfer, building simulations and hands-on skills of simulation using software packages such as, the integrated energy design tool LT, lighting design tool DIAL, integrated environmental solutions (IES) and energy assessment procedures. The module will also provide experimental practice.

Please note that there are three matching module description forms: CEM107, CEM17A and CEM17B. This is because the A and B versions are the flexible-modular equivalent of the full-time version. The flexible-modular equivalent runs over two years. The only difference between full-time and flexible-modular in relation to assessment is that the assignments and teaching for the 40-credit version are split across two years for flexible-modular students in two 20-credit versions. The differences in contact hours for these modules relate to the class contact hours.

Aims: The aim is to provide holistic approach to deliver sustainable buildings. The integrated process of design, operation and management will be the core of this module. Students will also be trained in hands-on computer simulation skills and experimental skills.

Yao, R. (Ed.) (2013) *Design and management of sustainable built environments*. Springer, London.

CEM17A SDM Principles and Practice A (20)

Convenor: Prof Runming Yao

Description: This module provides the knowledge and understanding necessary for students to perform environmental design and assess the performance of building passive and active systems in terms of their environmental impact. The module will introduce the role of building site impact, building façade design, building services engineering systems, construction materials, facilities management and system controls in moderating the internal building environment and an understanding of the energy implications for each. Building users' need and indoor environmental quality will also be addressed. The module will provide knowledge of heat transfer, building simulations and hands-on skills of simulation using software packages such as lighting design tool DIAL, integrated environmental solutions (IES) and energy assessment procedures. The module will also provide experimental practice.

Aims: The aim is to provide holistic approach to deliver sustainable buildings. The integrated process of design, operation and management will be the core of this module. Students will also be trained in hands-on computer simulation skills and experimental skills.

Yao, R. (Ed.) (2013) *Design and management of sustainable built environments*. Springer, London.

CEM17B SDM Principles and Practice B (20)

Convenor: Prof Runming Yao

Description: This module provides the learning opportunities through site visits and seminar provided by external speakers. The module will provide knowledge of heat transfer, building simulations and hands-on skills of simulation using software packages such as the integrated environmental solutions (IES) and energy assessment procedures. Health and safety issues will be included in the module contents.

Aims: The aim is to provide holistic approach to deliver sustainable buildings. Students will also be trained in hands-on computer simulation skills and experimental skills. Students will be required to grasp the knowledge of health and safety issues in engineering practice.

Yao, R. (Ed.) (2013) *Design and management of sustainable built environments*. Springer, London.

CEM18A Engineering Research Skills (20)

Convenor: Prof Runming Yao

Description: The module will introduce students to the basic skills for carrying out their dissertation research including sourcing literatures; critical reviewing literatures; identifying knowledge gaps; choosing a research topic and writing research proposal for the dissertation.

Aims: The module will introduce students to the basic skills for carrying out research, including the ability to develop a clear research question and subsequent research proposal; critically assessing relevant literature; identifying appropriate methods to address the posed question; and robust analysis of results. These elements of research will be introduced in

lectures, before the students embark on their projects. The aims are: to provide students with experience of undertaking a major, MSc level research project; to provide students with experience of presenting their work to a professional audience in a formal setting; to provide students the opportunity to experience and become familiar with specialist skills in an area of energy efficient building design, environmental system design, energy management, building performance assessment and relevant area which interest them and for which expertise exists within the University.

Preece, R.A. (1994) *Starting research: an introduction to academic research and dissertation writing*. Pinter, London.

CEM18B Engineering Dissertation (40)

Convenor: Prof Runming Yao

Description: Students are provided with academic supervision to support their dissertation research and writing on a topic of their choice.

Aims: By the end of the module, it is expected that the student will be able to demonstrate ability in the following areas: Conduct and communicate research in a relevant field at a postgraduate taught level; Select and use appropriate research methods and methodologies, including how to formulate research problems and an appreciation of alternative approaches to research; Use appropriate library resources and bibliographic aids to support research activity; Apply recognised research strategies and techniques, and to produce a sustained and logical argument on a specific research topic; Develop clear and concise dissertation writing and organisation of written material.

Preece, R.A. (1994) *Starting research: an introduction to academic research and dissertation writing*. Pinter, London.

CEM19A Energy Research Skills (20)

Convenor: Dr Maria Vahdati

Description: Students are provided with research skills classes to support their dissertation research and writing on a topic of their choice.

Aims: The aim is to equip students with the necessary understanding, knowledge and skills to formulate research problems, develop and apply appropriate investigative approaches, interpret data and present findings. The knowledge and skills developed will provide broad-based support for students to engage in reflexive scholarship in all of their taught modules. This module has a specific emphasis on preparing students to prepare a research proposal for their dissertation.

Creswell, J.W. (2013) *Research design: qualitative, quantitative, and mixed methods approaches*. Sage, London.

CEM19B Energy Research Dissertation (40)

Convenor: Dr Maria Vahdati

Description: Students are provided with academic supervision to support their dissertation research and writing on a topic of their choice.

Aims: The aim is equip students with the necessary understanding, knowledge and skills to produce a dissertation including all parts of a research project.

Creswell, J.W. (2013) *Research design: qualitative, quantitative, and mixed methods approaches*. Sage, London.

CEM110 Collaboration Practice and Innovation (40)
CEM11A Collaboration Practice and Innovation A (20)
CEM11B Collaboration Practice and Innovation B (20)

Convenor: Dr Dragana Nikolic

Description: This is the key integrating module for the MSc Information Management for Design Construction and Operation programme. It is based on the idea of integrating learning from core programme modules into a personal, coherent view of information management in construction and the built environment. We will investigate the diverse perspectives that different modules bring to the study of information management in construction through two continuous pieces of work running in parallel throughout the programme. First, through the use of reflective writing based on observations of practice and lessons from core modules. Second, the application of learning from core modules to a group case study that explores specific issues in information management and information systems implementation.

Please note that there are three matching module description forms: CEM110, CEM11A and CEM11B. This is because the A and B versions are the flexible-modular equivalent of the full-time version. The flexible-modular equivalent runs over two years. The only difference between full-time and flexible-modular in relation to assessment is that the assignments for the 40-credit version are split across two years for flexible-modular students in two 20-credit versions. The differences in contact hours for these modules relate to the class contact hours.

Aims: The aim is to explore the changing nature of knowledge and practice in the management, policy and environment of construction information management. These changes bring new opportunities and new challenges for the construction sector. We seek to apply the lessons from the core modules to a group case study of an information management system implementation and also to empower students to have ownership of their own professional development through reflective writing. This involves reflections on translating theory into practice and provides an opportunity for students to understand their own learning.

Morgan, G. (2006) *Images of organization*, 4th ed. Sage, London. (Chapter 4, Learning and self-organization: organization as brains, pp 71-114.)

CEM201 An Introduction to Project Management (10)

Convenor: Prof Stuart Green

Description: The construction industry is primarily a project-based industry and this module addresses the key principles that characterise projects. The principles of project management are applicable at all levels of the project hierarchy, ranging from individual work packages through to the provision of a single point of responsibility on behalf of the client. Effective project management is central not only to project performance, but also to performance at the industry level. The last few decades have seen significant changes in the way that projects are managed. Traditionally fragmented approaches have given way to the provision of an integrated project management approach that delivers construction projects to required standards of time, cost and quality. The technical complexities of modern buildings and the demands of client organisations require an increasingly sophisticated service from project managers.

Aims: The main aim of is to address the core principles, different techniques and skills that are applicable at different levels of project management. At the work package level, the emphasis is in ensuring on-site production within specified constraints of time and cost, and with the view to achieve the highest possible quality. At the strategic level, on managing the evolving interfaces between the client and the project. Irrespective of the level of application, effective project management depends upon a blend of advanced behavioural skills and appropriate techniques. The project manager who manages the project on behalf of the client must be able to co-ordinate teams of designers and specialists from diverse backgrounds. Leadership skills are therefore of vital importance, coupled with an ability to structure problems at the conceptual level.

Fewings, P. (2013) *Construction project management: an integrated approach*. Routledge, London.

CEM202 Construction Project Management (10)

Convenor: Dr Shabnam Kabiri

Description: The construction sector provides infrastructure and facilities to all other economic sectors. In this module we address the key principles of managing the supply side of this provision. Construction work is typically oriented around projects and the supply chain is extensive. In this kind of business environment, a key requirement is to manage the delivery of specific obligations within the parameters of specific objectives. Moreover, the success of the business depends on the ability to manage the demands of a variety of simultaneous projects. Effective project management is essential to business success. Managing a number of projects, in sequence and in parallel, especially so. Thus, the focus in this module is on the interface between delivering successful projects and managing the flow and balance between projects in order to maintain a successful business.

Aims: To provide an explanation of basic project management techniques and an understanding of how construction businesses manage their resources within and between projects. At the work package level, the emphasis is on achieving delivery within specified targets relating to cost, time and quality. At the tactical level, the emphasis is on maintaining and developing the businesses whose income is derived from projects.

Sherratt, F. and Farrell, P. (2015) *Introduction to construction management*. Routledge, Abingdon.

CEM203 Financial and Management Accounting in Construction (10)

Convenors: Prof Will Hughes and John Aston

Description: A general introduction to financial accounting is provided in the context of the construction sector. Construction firms, in common with all firms, have to undertake corporate financial accounting. This requires an understanding of the basic concepts and the technical language of the discipline, as well as understanding of the principles and practice of financial accounting. Management accounting is about the provision of financial data and advice to a company for use in the organization and development of its business. It relates to organisational decision-making, financial planning, financial control and the evaluation of the financial performance of firms.

Aims: To introduce the way that financial and management accounting are used as key tools of management for a construction firm; To provide an appreciation of key financial and management accounting concepts and the role financial information plays in planning, controlling and decision making by managers. Gain appreciation of the differences and the link between financial and management accounting and the roles played by each in the management of a construction firm; Understand key concepts in financial and management accounting as necessary tools for managing an enterprise; Prepare and interpret financial statements such as a cash flow statement, an income statement, a balance sheet and a profit and loss account; Gain awareness of investment appraisal methods as decision making tools; Appreciate the different approaches to the costing of a product and the importance of costing to profitability.

Davies, M. and Aston, J. (2011) *Auditing fundamentals*. Financial Times/Prentice Hall, Harlow.

CEM204 International Construction (10)

Convenor: Prof Roger Flanagan

Description: The module gives an overview of the scale and scope of design, engineering, and construction work in the global construction market. Consideration is given to the structure of the different construction markets and the influence of culture, climate, geology, the regulatory framework of codes and standards, compliance and ethical behaviour. Different approaches approaches to the procurement of professional services and construction work are considered. Examining how international construction companies operate in the global construction market and how they manage risks in project delivery.

Aims: Having an understanding of the size and characteristics of the global construction market, and the drivers and issues shaping the market. Awareness of the organisational structure and strategy of the construction and consulting companies operating internationally. Understanding the importance of global standards, governance, and codes of practice used on international projects.

Chartered Institute of Building (2017) *Global Construction Review*. CIOB, London. Available at: http://www.globalconstructionreview.com/

CEM205 Human Resource Management (10)

Convenor: Dr Florence Phua

Description: Effective human resource management (HRM) contributes significantly to overall organizational performance. The module will cover the essential elements of HRM and their implementation in the UK construction industry. It draws on current HRM concepts, theories and practices from different industries to facilitate understanding of the human resources issues that are faced by both construction and non-construction firms. It will explain how an informed, well-structured and participative approach to HRM can deliver substantial benefits to all stakeholders: employers and employees as well as their shareholders and clients.

Aims: To provide students with an appreciation of the characteristics and practices of the construction industry and the role of HRM in both project- and non-project based organizations; To introduce students to current perspectives on key HRM concepts; To provide students with an understanding of the theories and practical considerations of HRM and its implications for construction firm performance and strategic positioning.

Dainty, A. and Loosemore, M. (2012) *Human resource management in construction: critical perspectives*. Routledge, London.

CEM206 Construction Contract Law (10)

Convenor: Prof Will Hughes

Description: The procurement of construction work takes place within specific legislative frameworks. Contracts result from agreements between businesses for all forms of consultancy and construction work, whether they are formally written or not. New developments in statutes, court cases and standard form contracting have a significant impact on the kinds of deals that take place in the construction industry. Also, new business processes promote new ways of working and collaborative business arrangements that require a deeper understanding of the way that business participants interact in the construction process. The construction industry is characterised by the way that each participant typically works for a different practice or firm, and they are all expected to work together, usually under the terms of business contracts (formal or informal) within the statutory framework that prevails. This module seeks to explain the statutory and contractual context of contracts in construction, in order that the students will be able to recognise and confront the kinds of problem that can get in the way of successful contract management.

Aims: To understand and interpret contractual relationships in construction projects. Lessons from research and practice are used side-by-side with the teaching to provide robust explanations and help to develop a deep understanding of the consequences of how construction contracts are drafted, chosen and managed.

Hughes, W.P., Champion, R. and Murdoch, J.R. (2015) *Construction contracts: law and management*. 5th ed. Routledge, Abingdon, Oxon.

CEM209 Managing Construction (10)

Convenor: Prof Roger Flanagan

Description: The management of construction work requires a broad overview of management and organisational theories applied to the construction sector. While most of the work in the construction sector takes place in projects, the people who contribute to projects work in firms and other organisations. Construction firms may have local, national and international dimensions. The interfaces between various levels in construction organisations are made more complex because the work is done through projects. This module enables students to explore the complex interfaces in the management and organisation of construction work.

Aims: To provide a range of tools and techniques for understanding and managing organisations and projects in construction. The focus is on the application of ideas to real-world situations.

Osterwalder, A., Pigneur, Y. and Clark, T. (2010) *Business model generation: a handbook for visionaries, game changers, and challengers*. Wiley, Hoboken, NJ.

CEM210 People, Information and Technology (10)

Convenor: Dr Ian Ewart

Description: The proliferation of digital data, and the rapid development of tools and technologies to collect, analyse and disseminate it, are opening up new opportunities for the Architecture Engineering and Construction sectors (AEC). However, this is set against the need for information that is relevant, accessible and useful at a human scale. Balancing developments in digital technologies with specific user requirements, forces us to think about why and how data is collected, and how it can be presented in useable ways. Blending social science methods with modern digital technologies, we will examine the relationship between people and the information that circulates in an AEC setting. Students will learn about and use digital tools and technologies to produce models and representations of the built environment, whilst also engaging with the built environment as perceptive human beings.

Aims: To gain a basic experience of using a range of modern digital tools, and processing the data produced. To learn how to analyse the built environment from a human perspective, using approaches from anthropology and sociology. To consider how these two perspectives compliment and complicate the construction of useful information.

Porter, M. and Millar, V. (1985) How information gives you competitive advantage. *Harvard Business Review*, 63, 149–160.

CEM215 Infrastructure Development (10)

Convenor: Dr Tabarak Ballal

Description: To meet the challenges of rapidly growing urban communities and cities, infrastructure development projects need to be responsive, inclusive and sustainable. It is therefore essential to understand the planning, finance and delivery of these projects and

the challenges associated with meeting development goals in increasingly complex and uncertain contexts. Decision-making processes of infrastructure projects must respond to the specifics of the local context (including local knowledge, culture, legal and institutional frameworks, industry characteristics, funding models, procurement methods and so on).

Aims: The main aim of this module is to explore the role of infrastructure in development and explain theoretical frameworks that underpin the processes of design, construction and implementation of infrastructure development projects. It primarily focuses on the challenges of delivering infrastructure projects and the impact of these on achieving developmental goals.

Schumacher, E.F. (1974) *Small is beautiful: a study of economics as if people mattered*. Abacus, London.

CEM216 International Construction Labour (10)

Convenor: Dr Dylan Tutt

Description: To meet the challenges of rapidly growing urban communities and cities, infrastructure development projects need to be responsive, inclusive and sustainable. It is therefore essential to understand the planning, finance and delivery of these projects and the challenges associated with meeting development goals in increasingly complex and uncertain contexts. Decision-making processes of infrastructure projects must respond to the specifics of the local context (including local knowledge, culture, legal and institutional frameworks, industry characteristics, funding models, procurement methods and so on).

Aims: The main aim of this module is to explore the role of infrastructure in development and explain theoretical frameworks that underpin the processes of design, construction and implementation of infrastructure development projects. It primarily focuses on the challenges of delivering infrastructure projects and the impact of these on achieving developmental goals.

Buckley, M. (2012) From Kerala to Dubai and back again: Construction migrants and the global economic crisis. *Geoforum*, **43**(2), 250–259.

CEM217 Construction Sector Transition (10)

Convenor: Dr Shu-Ling Lu

Description: This module equips students with leading-edge knowledge and practices on transition management approaches to bring about successful construction reform in a country. The module demonstrates how construction sector policies, company strategies and new technologies are all closely interconnected and the profound transition management challenges these complex interactions create. Throughout the module, detailed cases studies are used to bring key issues to life. The cases are drawn from research projects being undertaken by members of the module delivery team in the transition management area.

Aims: The construction sector in all economies has a potentially powerful catalytic role in enhancing wealth generation and quality of life. However, construction sectoral characteristics in such economies often significantly constrain this potential. These

characteristics may include deeply entrenched structures, practices and workforce capabilities which work against innovation and change, especially uncertain government construction sector policies and regulations, unskilled workforces, low productivity, poor infrastructure, fraudulent practices and inadequate contract law provision and enforcement. The focus of this module is to understand construction industry reform from a transition management, multi-level perspective. Construction sector reform involves mutually coherent and progressive transitions that need to change and connect improvements across higher level policy, regulation and societal values and norms, right the way through to the incorporation in construction companies and projects of new technologies and practices.

Grin, J., Rotmans, J., Schot, J.W., Geels, F.W. and Loorbach, D. (2011) *Transitions to sustainable development: new directions in the study of long-term transformative change*. Routledge, London.

CEM220 Urban Sustainability (10)

Convenor: Prof Tim Dixon

Description: This module develops an awareness and knowledge of how the principles of sustainable development can be applied in an integrated and holistic way at city level.

Aims: The urban sustainability module places sustainable development (SD) within a city-level context but also highlights the importance of integrating SD across building, neighbourhood and city levels to ensure sustainable outcomes. The module explores the different ways in which new cities (e.g. eco-cities and smart cities) and existing cities may be viewed through a range of conceptual frameworks which include 'metabolic systems' and 'complex adaptive' systems. The overall role of urban planning is also explored in shaping and producing sustainable outcomes in a variety of cities with a key emphasis on sustainable transport. Consideration is also given to the challenges of retrofitting and re-engineering cities to 2050, and the ways in which futures studies can not only help shape city visions, but also help cities plan and monitor energy, water and waste targets. The module also explores the concept of 'sustainable cities' and the ways in which the sustainability of cities may be measured, and how key technologies at city level are deployed (for example urban water drainage and urban waste management). The module compares and contrasts approaches to urban sustainability through a comparison of approaches in the developed and developing world (and with a particular emphasis on emerging economies).

Dixon, T. , Connaughton, J., and Green, S (eds) (2018) *Sustainable Futures in the Built Environment to 2050*. Wiley, Oxford.

CEM221 Energy in Buildings (10)

Convenor: Dr Mehdi Shahrestani

Description: A comprehensive overview of energy use in buildings will be overviewed. The module will introduce measures of improving energy efficiency in buildings including environmental architectural design, environmental systems operation and renewable energy technologies.

Aims: To provide students with comprehensive understanding of energy usage in buildings and methods of improving energy efficiency.

Harvey, L.D.D. (2010) Energy use in buildings. In: *Energy and the new reality: 1: Energy efficiency and the demand for energy services* (pp. 115–245) Earthscan, London.

CEM222 Building Simulation (10)

Convenor: Dr Emmanuel Essah

Description: This module briefly introduces theory of heat transfer, overview of building simulations and train students with skills of computer simulations.

Aims: To provide knowledge of building simulations and hands-on practice of simulation using commercial software packages such as Integrated Environmental Solutions (IES).

Jankovic, L. (2012) *Designing zero-carbon buildings using dynamic simulation methods*. Routledge, London.

CEM223 Urban Microclimates (10)

Convenor: Dr Vincent Luo

Description: The module introduces the basic physics as well as the up-to-date advances on urban microclimates including urban fluid mechanics, energy balance, solar radiation, acoustic etc, and evaluates how the urban surroundings interact with buildings. It will also address the application of urban microclimate principles to guide and assess urban climatic design and planning.

Aims: The aim is to develop comprehensive knolwedge of urban microclimates and the impact of built form and texture on urban climate and building performance. We cover the fundamental physics behind urban microclimates and explore urban climate simulation tools to assist urban climate planning. We will develop in-depth understanding of how: Urban microclimates are formed and operate; Climate change impacts on urban climates; Urban heat island phenomena operates and its impact on building energy consumptions; Urban texture and form impacts on microclimates; Sustainable urban design has evolved and operated; Urban ventilation should be designed and encouraged; Urban environments and buildings interact.

Givoni, B. (1998) *Climate considerations in building and urban design*. John Wiley & Sons, New York.

CEM224 Carbon Management (10)

Convenor: Dr Michael Peters

Description: Climate change presents a pressing and complex global challenge, which can be addressed through some combination of adaptating human systems to withstand future impacts and mitigating the worst effects of climate change by reducing emissions of greenhouse gases. This module concentrates on the role of carbon management for countries, businesses and individuals in responding to the need for climate change mitigation. Attention is given to the level of certainty in climate science and the implications

this has for global and local action. Policy tools for achieving carbon reduction and the role of the energy supply system are considered, alongside technological options for carbon sequestration.

Aims: To frame the need for carbon management against the scientific understanding of climate change, noting how clear understanding of scientific uncertainty is fundamental in developing appropriate carbon management policy and actions. To explore political, economic and technological responses to climate change, recognising how these are/ can be implemented across a range of scales from global / regional agreements, through national policy approaches, down to actions taken by businesses and individuals.

Emmanuel, M.R., and Baker, K. (2012) *Carbon management in the built environment*. Routledge, London.

CEM225 Building Information Modelling (10)

Convenor: Dr Laura Maftei

Description: The module introduces and explores Building Information Modelling (BIM) as sets of standard processes for managing information across delivery, operations and handover. The module addresses BIM as a collaborative process, supported by a range of technologies, and introduces concepts of structured collaboration, data exchange, interoperability, and life cycle information management, in lectures and through group work. Emphasis is placed on the UK BS / PAS 1192 suite of standards as an example of a BIM process, although international alternatives are discussed.

Aims: To understand the rationale and role of BIM processes in professional work across design, construction and operation. To recognise the range of processes, standards and approaches which can constitute BIM.

Richards, M. (2010) *Building Information Management. A Standard Framework and Guide to BS 1192*. London: BSI British Standards Institution.

CEM226 ICT and Energy Management (10)

Convenor: Prof Li Shao

Description: The substantial gap between design and in-use performances affects a wide range of newbuild and retrofit projects as well individual energy technologies. Against this background, energy monitoring and management offers major energy saving potential. Based on ICT and sensor technologies, energy monitoring and management integrates the optimisation of building energy systems with the engagement of users and FM in the process. This module will address these technology and user issues in a systematic way.

Aims: This module focuses on people-centered energy efficiency in the operation phase (versus design, construction and handover phases) of the building life cycle using ICT-based approaches for monitoring and managing energy consumption in buildings. The module will address information and building energy technologies and their application to inform, engage and empower users to achive substantial energy savings at modest costs.

Chartered Institution of Building Services Engineers (2004) *CIBSE guide F – Energy Efficiency in Buildings*. 2nd ed. Chartered Institution of Building Services Engineers, London.

CEM228 Construction Economics (10)

Convenor: Prof John Connaughton

Description: This module covers construction economics at three broad levels: Macro, dealing with the role of the construction industry in the national economy and the impact of macro-economic policies and developments on the property and construction sectors; Meso, focusing specifically on the size, structure and performance of the construction industry, and how it compares to other sectors; and Micro, covering the economic performance and behaviour of construction firms and the economics of construction projects, in their respective markets.

Aims: To provide participants with an understanding of how the conceptual framework of economic analysis can help to address a wide range of practical problems and questions encountered in the modern construction industry.

Ive, G. and Gruneberg, S.L. (2000) *The economics of the modern construction sector*. Macmillan, Basingstoke.

CEM229 Green Building Assessment (10)

Convenor: Dr Vincent Luo

Description: This module integrates the BREEAM Accredited Graduate (AG) program into the module design. It covers assessment methodology, Interntional GBA scheme such as BREEAM, and GBA case studies. The major teaching approaches are lectures, workshops and tutorials. Students will be trained to be able to evaluate 'green performance' of a real building using green building assessment tools.

Aims: The aim is to provide a comprehensive knowledge of the green building concept and specifications of the existing green building assessment tools. We develop an in-depth understanding of: the concept of green buildings; carbon emission reduction targets and measures to achieve them; the mechanism of measuring and rating sustainability of buildings; green building assessment methods/rating tools; international standards; resource conservation in construction (materials, energy, water etc).

Montoya, M. (2011) *Green building fundamentals: practical guide to understanding and applying fundamental sustainable construction practices and the LEED system.* Prentice Hall, Upper Saddle River, NJ.

CEM230 Design Management (10)

Convenor: Prof John Connaughton

Description: This module is designed to develop an understanding of current and developing approaches to design management. Participants will gain an appreciation of the management of design processes and the essential conflict between creative design and the need for control. The module will introduce a range of practical measures for effective design management.

Aims: To develop robust understanding of the organisation of design processes; To appreciate differences between the management of design and the management of construction; To gain important insight into the complex nature of project briefing; To benefit from practical insights into briefing and design management processes, as applied on projects.

Enyon, J. and Chartered Institute of Building (2013) *The design manager's handbook*. Wiley-Blackwell, Chichester.

CEM233 Urban Energy Systems (10)

Convenor: Dr Phil Coker

Description: Emerging technologies, especially alternative vehicles and electricity based heating systems, have potential to bring a rapid change in demand on urban energy systems. Such changes need to be understood at district and city scales and may also be best managed at these scales. This module will consider the possible impacts of such changes and appropriate mitigation approaches, including the emergence of smarter energy grids. A particular focus is given to the rapidly changing role of energy distribution networks. Consideration of urban energy systems is used to introduce wider systems thinking approaches that offer new insights and currently have an evolving place in energy and sustainability research. Wider aspects of urban sustainability specifically related to energy use are also addressed.

Aims: To develop skills in analysing energy systems at an urban scale; as well as to introduce specific issues from the sustainability agenda that are more problematic in urban areas and closely linked with energy use.

Grèubler, A. and Fisk, D. (2013) *Energizing sustainable cities: assessing urban energy*. Earthscan, London.

CEM235 Engineering Project Management (10)

Convenor: Dr Colm Lundrigan

Description: Engineering projects have a financial and management context. From the standpoint of management, this module introduces a project management conceptual framework, defining what is meant by a "project" and what comprises the discipline of "project management". From the financial standpoint two well-known techniques are introduced. First, capital budgeting, which is a technique usually implemented at the beginning of a project to assess its economic feasibility. Second, earned value management, whose main aim is to monitor project progress during the execution phase.

Aims: To understand and be familiar with the main concepts of the Project Management Body of Knowledge® and to be able to implement and adapt to the particular circumstances of a renewable energy project, two quantitative techniques; capital budgeting and earned value management.

Kerzner, H. (2013) *Project management: a systems approach to planning, scheduling, and controlling.* Wiley, Hoboken.

CEM237 Basic Measurement Principles (0)

Convenor: Dr Lawrence Mbugua

The basic principles and techniques of quantification and measurement of construction work are introduced. This includes techniques that may be carried out using computer software and/or technology. The purpose is to introduce the basics of measurement and construction technology. This module is related to CEM238 Construction Cost Engineering. There is need for basic knowledge and skills to take the study of this topic to MSc level. Those students who may already have learned this material on an earlier qualification may be exempted from the requirement to attend this module if they can prove that they have achieved the relevant level of understanding with a recognised qualification. This exemption is subject to approval by the Programme Director.

Aims: To provide a basic, initial skill in the fundamental techniques which underpin the techniques of quantification of construction work, that is, the mensuration, definition and quantification of items of construction work for the purposes of early-stage estimates of cost and preparation of contract documentation. To provide knowledge and understanding of IT applications used for these techniques and to give practical experience in the use of the technology.

CEM238 Construction Cost Engineering (10)

Convenor: Dr Lawrence Mbugua

Description: The module builds on CEM237 Basic Measurement Principles and covers more advanced / complex aspects of quantification and measurement of construction work.

Aims: Buildings and related facilities are expensive to construct, maintain, refurbish and operate. Meeting these costs requires significant expenditure and investment by the developer, building owner or the occupier. It is therefore important that these costs are accurately estimated and budgeted for before construction work starts; controlled and planned for during construction as well as forecasted for the operational life of the building. The aim is to equip the students with the skills and knowledge to estimate, plan, manage, control and engineer building costs across all stages of the development process: from financial feasibility appraisal, design, construction procurement, construction operations, commissioning, maintenance, refurbishment to demolition.

Emmitt, S., Gorse, C.A. and Barry, R. (2014) *Barry's Introduction to construction of buildings*. Wiley-Blackwell, Oxford.

CEM241 Energy and the Environment

Convenor: Dr Maria Vahdati

Description: Energy underpins our current standard of living and economic development. The environmental impact of energy use and transition to a lower carbon economy presents significant challenges. This module is concerned with the technical, environmental, economic and social issues associated with the production of energy. It includes an overview of energy production and consumption trends, traditional means of energy

production, renewable energy, sustainability, environmental issues and political and economic concepts in energy. Students are able to explore a range of energy related issues through conducting research for one assessed report.

Aims: To provide a multi-disciplinary, integrated introduction to technical, environmental, economic and social issues associated with energy production, including the consideration of the practical constraints that limit the extent to which negative impacts can be ameliorated.

CEM242 Advanced Visualisation and Interactive Technologies (10)

Convenor: Dr Dragana Nikolic

Description: Practitioners in the architecture, engineering and construction (ACE) disciplines often find that no single drawing, graphic or tool best represents a given idea, concept or project. However, to evaluate a project at any stage, engineers, designers and stakeholders need to visualize project progress in a way that allows them to easily interact with, understand, critique and revise the work. One of these methods, virtual prototyping, tailors information representation for users and affords a level of interactivity that can assist the decision-making process at any point in the design and construction process (e.g. conceptual design diagrams for initial project phases or photorealistic representation at final phases). The purpose of this module is to introduce students to different interactive virtual prototyping tools and technologies used in the architecture, construction and engineering fields, particularly those related to building information modelling (BIM) and visualisation. Through a review of current research and applications of virtual reality and interactive technologies, the goal is to discern and evaluate the rationale for their use, and further explore methods to apply innovative approaches to support users in a given context of use.

Aims: To introduce students to the range of advanced and innovative visualisation and interaction approaches for facility design and construction; to review and evaluate existing initiatives in research and practice; to identify potential uses in a given context, and propose a method, prototype, or a process to visualise and interact with relevant project information.

Whyte, J. and Nikolic, D. (2018) *Virtual reality and the built environment*. 2nd ed. Routledge, Oxford.

CEM243 New Technology, Management and Change (10)

Convenor: Dr Martin Green

Description: The module is structured around the concept of socio-technical systems. We cover distinct analytical and theoretical approaches to understanding socio-technical systems - their research base, points of difference and where they complement each other, their advantages and disadvantages. This involves the application of theoretical approaches to realistic case studies in construction in oral presentation and written writing.

Aims: To gain an understanding of major theoretical approaches to socio-technical systems and to their use in understanding and implementing systems and change in the contexts of built environment and infrastructure teams, projects, firms and the construction sector.

Grint, K. and Woolgar, S. (1997) *The machine at work: technology, work and organization*. Polity Press, Cambridge.

CEM244 Analysing Construction Processes (10)

Convenor: Dr Ruth Dowsett

Description: There is a wide range of methods for researching, analysing and formally representing processes and data in design construction and operations. These are formalised through construction industry data codes and standards, which will be covered in the module. We shall examine problems related to human-computer interaction in construction, hybrid practices and task analysis in computer-supported collaborative work.

Aims: To gain relevant knowledge and skills to analyse construction processes and structures and develop abstracted and systemic forms of representation and understanding.

Baldwin, A.N., Austin, S.A., Hassan, T.M. and Thorpe, A. (1999) Modelling information flow during the conceptual and schematic stages of building design. *Construction Management and Economics*, **17**(2), 155–167. https://doi.org/10.1080/014461999371655

CEM302 Strategic Management (10)

Convenor: Prof Roger Flanagan

Description: This module is designed to study strategic management in construction organisations. Strategic management is the process for producing strategies within an organisational infrastructure responding to an environmental context.

Aims: The module aims to explain the role of corporate strategic management within the construction industry. It examines the evolution of strategic management concepts from the 1960s to the present day. These concepts are then related to current research and thinking about the creation, culture and context of strategy.

Langford, D.A. and Male, S. (2001) *Strategic management in construction*. Malden, MA: Blackwell Science.

CEM303 Sustainable Design, Construction and Operation (10)

Convenor: Dr Katherine Hyde

Description: Buildings consume large amounts of energy and water and produce pollution and waste during construction and operation. Sustainable design via green approaches can reduce these impacts substantially and also decrease carbon dioxide emissions. Sustainability is the optimum and clean use of resources for healthy working and living conditions for the present and future generations. Sustainable development is the planning, designing and caring for buildings and systems which are adaptive to changes brought about by climate and everyday needs of occupants while being sustainable over the long term.

Aims: To deliver an integrated, systemic and holistic understanding of sustainability and sustainable development; To inspire and excite participants in their role with the

opportunities that sustainable practices can present; To engender an understanding of the difference between cost and value in the area of climate change; To understand their environmental, social and economic dimensions; To consider relevant policy, legislation and governance nationally and internationally; To be familiar with the latest evidence and thinking on climate change, energy, water, pollution, waste, biodiversity, and efficient use of materials; To broaden the understanding of the social benefits of a more sustainable built environment from the level of the individual to the level of community; To learn about whole life value which takes into account whole life costing and quality; To learn about modern and traditional approaches; To understand the influence of human behaviour on patterns of consumption and production; To understand the significance of implementing a solutions-oriented approach with the judicious use of innovation.

Carbon Trust (2009) *Building the future today*. Available at: https://www.carbontrust.com/resources/reports/technology/ building-the-future

CEM319 Life Cycle Assessment (10)

Convenor: Dr Eugene Mohareb

Description: This module introduces the concept of life cycle assessment (LCA), methodological approaches for completing an LCA study, reviews prominent studies and provides students with the opportunity to critically review an LCA study of their choosing.

Aims: To provide an understanding of the concept of LCA and its value in assessing the environmental impacts of products or services. Students will explore key LCA concepts, structures, methodological approaches, and the implications of these approaches. At the end of the course, students will have the ability to understand and critically review an LCA study. To develop LCA knowledge and skill from a suitable level of analytical enquiry-based challenges.

Crawford, R.H. (2011) *Life Cycle Assessment in the Built Environment*. Taylor and Francis, London.

CEM335 Real estate Development: Analysis & Appraisal (10)

Convenor: Dr Ed Shepherd

Description: Real estate development encompasses a range of skills and knowledge derived from a number of disciplines. Several techniques are used to undertake financial analysis of development opportunities and critically evaluate different techniques for the pricing and appraisal of development opportunities with a particular emphasis on risk management.

Aims: The aim is to develop a conceptual understanding of the key elements of the real estate development process and a comprehensive understanding of the key techniques for evaluating the various aspects of the feasibility of real estate development. The roles of the various participants involved in the development are critically reviewed to develop insights into the elements of the process such as planning consent and finance, procuring construction services and design.

Byrne, P., McAllister, P. and Wyatt, P. (2011) Precisely wrong or roughly right? An evaluation of development viability appraisal modelling. *Journal of Financial Management of Property and Construction,* **16**(3), 249–271.

F – How we support students

Inclusivity

The University is committed to inclusivity, which includes ensuring our teaching and learning practices are accessible to all, as set out in the Curriculum Framework. Our Policy on Inclusive Practice in Teaching & Learning provides greater clarity and emphasis to our commitment to an inclusive approach. Find out more:

💻 Curriculum framework

💻 Essentials: Accessible teaching and learning materials

Where to go for help with studies

Learning support and guidance is provided by a wide array of services across the University, including: Academic Tutors, the University Library, the Careers Centre, the Academic English Programme, Study Advice, the Mathematics Support Centre and IT Services. There are language laboratory facilities both for those students studying on a language degree and for those taking modules offered by the Institution-wide Language Programme.

Academic tutors

We have launche a new Academic Tutor System, with effect from September 2018. The Academic Tutor System replaces the previous Personal Tutor System and has been designed following extensive consultation with staff and students, as well as research into similar systems at other UK universities.

Every student will be allocated an Academic Tutor – a member of academic staff in your School. Academic Tutors work in partnership with students and our wider support services to support their academic, personal and professional development. For example, Academic Tutors help students to:

- make decisions in relation to their course
- formulate plans to support their academic, personal and professional development
- connect with other academics in their field of study
- make the most of the development opportunities on offer at Reading
- connect with other support services as appropriate.

You should meet with your Academic Tutor at least once a term to discuss your academic progress and development. For further information about how to make the most of your Academic Tutor, and other support services available at the University, please visit:

💻 Academic Tutors

Library

The Library supports your learning by providing access to print and digital resources (including e-journals, e-books, multimedia resources and databases), and search facilities to help you find books, journals and other materials for your studies. If you are new to Reading, take a look at our guide to getting started with the Library:

💻 Information for new students

Your campus cared is also your library card, which gives you access to the Library building. If the library does not stock a particular book or journal, there is an Inter-Library Loan service through which you may request books and articles in journals held elsewhere. This is a particularly useful service when researching for your dissertation.

As well as a wide range of print and digital resources, the Library also offers expert support for your studies from our Academic Liaison Librarian, Study Advice, and Maths Support teams.

Academic Liaison Librarians

Your Academic Liaison Librarian is your main point of contact with the Library – there is one for every subject offered at Reading. They can help you make effective use of the huge range of resources the Library has to offer in support of your studies by:

- showing you how to use information resources effectively – Liaison Librarians create online Library guides for your subject and can provide group training sessions for your School/Department
- providing individual help with research – Liaison Librarians can offer in depth one to one help in finding information. This includes: helping you to identify the most relevant print and e-resources to use; providing guidance on developing effective search strategies; and advising on referencing, including the use of bibliographic management software such as Endnote
- showing you how to save time by making the most of all Library services.

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Study Advice

We are a professional and friendly team based within the Library on the Whiteknights campus. We work with students in all disciplines and at all levels of academic study, from undergraduate to PhD. We can help you to:

- develop more effective practices for studying at university
- have a clearer understanding of what tutors expect
- make studying less stressful
- achieve better marks.

With our expert guidance, you can develop your skills for study success and help yourself to a better degree! More information can be found here.

Maths Support

Maths Support is a drop-in service which is available for help with any mathematical topic you need for your studies, such as: basic arithmetic, percentages, formulae, logarithms, differentiation, integration, etc. Our experienced mathematicians can help you with any problems you may have, and build your confidence in a relaxed and friendly environment.

We also offer regular Wednesday workshops and other events throughout the year; the topics for each term can be found on our website. This also gives details of our location, opening hours, and links to useful learning resources. We have an extensive list of

worksheets, guides and links to video tutorials which you can access at any time to practise and develop your mathematical skills.

Additional support for Library users

The University's Policy on Inclusive Practice in Teaching and Learning was launched in January 2018 to provide greater clarity and emphasis to our commitment to an inclusive approach to teaching and learning.

The Library has an excellent guide to finding and using inclusive technology in your learning, as well as guides providing information on how the Library can support your studies including studying with dyslexia and other specific learning difficulties and help for users with disabilities.

As a student of the University, you are also entitled to install and use Microsoft Office 365 for free on your own computer, tablet or phone. Office 365 includes many accessibility features – see Microsoft's inclusive Office 365 for further details. The University's IT department has information about accessing and installing Office 365.

Support Centres

Teaching and Learning support teams/Support Centres are your first port of call for anything ranging from a query about Campus Cards, advice on changing programme or on module selection, submitting extenuating circumstances forms and placements advice, to any other general or programme-specific question. For full information regarding how and when you can access the service and who does what, please visit the student support webpage.

💻 Student Support

Where do I go for other help/advice?

Student welfare support and guidance is provided by the Support Centres, alongside our range of specialist support services including Student Welfare Officers, the Students' Union Advice Team, the Medical Practice, Counselling and Wellbeing and the Disability Advisory Service. Student Services also offer advice and support in a number of areas, including finance and academic issues such as withdrawals and suspensions.

💻 Support and Wellbeing

Student Welfare Team

The Student Welfare Team is here to help you with any personal difficulties you may experience during your time at the University. The team is made up of professional welfare staff who are able to advise you on a wide range of personal and welfare issues that may impact your studies and day-to-day life. For further information:

💻 Student Welfare Team

Disability Advisory Service

The University of Reading welcomes disabled students and has a dedicated Disability Advisory Service. The service offers advice and guidance to students with any disability, long term medical condition, mental health condition, or specific learning difficulty (SpLD).

If you have not yet told the University about your disability or your learning difference, or have not disclosed it on your application, you can discuss the implications of a disclosure in complete confidence, with one of our Disability Advisers.

The team can offer advice on applying for Disabled Students Allowances and with your permission liaise with your department, the Examinations team and Support Centre to agree reasonable adjustments. They can also help you in setting up your DSA support. More information on the wide range of disability support offered to assist you through your studies can be found at:

💻 Disability support

Counselling & Wellbeing

The student welfare team works throughout the year to help students manage a wide range of issues, working to minimise the impact of any problems on their academic progress. All staff who work in the service are very experienced and are used to working with students studying at all levels, and from all nationalities and cultures. They know and understand the problems that students face and are able to provide valuable and independent support.

💻 Counselling and Wellbeing

Student Services Reception/Online services

The Student Services Reception provides advice and signposting to services such as Immigration, Careers and Disability.

💻 Student Services Reception

Finance

The Student Financial Support Team are here to offer help, advice and support on a wide range of financial issues, including:

- advice in relation to tuition fees; in-particular specialist advise on funding via the Student Finance Authorities (i.e. Student Finance)
- bursaries
- short-term loans
- Student Support Fund
- liaison between you (the student) and Student Credit Control in times where you are struggling to meet the cost of your tuition fees and/or accommodation cost
- work with the RUSU Money Advisors to support you in matters relating to financial difficulties.

💻 Student Financial Support Team

International students

The International Student Advisory Team offers information and advice for all international and EU students, providing professional and confidential support on:

- helping you (and your family if applicable) settle in the UK when you arrive
- understanding the UK culture and developing integration skills
- providing information about the local area and places of interest
- general advice and signposting to what is available at the University to enable you to make the most of your time here

💻 Information for International Students

Chaplaincy

The Chaplaincy Centre is a central point on campus, providing a good place to go for a quiet coffee and a listening ear.

The Chaplains can provide sign-posting for faith and wellbeing needs, whatever your religious beliefs. Feel free to call, email or just drop in to see them. Find out about pastoral support to students of any (or no) faith, as well as the event we run here.

Reading University Students Union (RUSU)

RUSU is a student-led independent charity, based on Whiteknights campus that exists to represent, support and provide opportunities for all students studying at the University of Reading. As a student, you are automatically a member of the Students' Union.

Our ultimate ambition is to deliver essential and relevant services to students in an accountable, inclusive and dynamic way. As RUSU is a separate organisation to the University of Reading, we will fight to ensure that the student is always put first. More can be found on the RUSU website.

RUSU Advice

We offer advice, or point you in the direction for help on matters such as welfare, money, education, accommodation and any other issues you may face. The RUSU Advice Team offer free, impartial and expert advice helping students with a wide range of issues, from financial, to academic. The advice team are based in the ARC in the RUSU building. You can go to the RUSU Advice webpage to find out how to get in touch.

RUSU Nursery Service

There are many students who are also parents with young children. RUSU provides an excellent nursery facility, Little Learners Nursery, for children aged 3 months to school age. If you're a parent and have your children here at Reading, you can find more information and apply for a place by visiting RUSU Nursery.

Complaints procedures

A student who has a complaint about his or her programme should, in the first instance, talk to his or her Programme Director about the problem. Most difficulties are solvable at this level. If the student is not satisfied, the problem should next be discussed with the

School Director of Teaching and Learning. A student who is unable or unwilling for good reason to take a complaint by this route should see the Associate Dean (Teaching and Learning). If none of these avenues of complaint yield a satisfactory response, the student should write to the Director of Student Services.

You can find the University's Student Complaints Procedures at: http://goo.gl/I4BNMP

G – Performance and assessment

… or, how to get a good degree.

Academic engagement

You are academically engaged if you comply with the academic requirements stated in the University's Statement of learner responsibilities, in particular those requirements relating to engagement with the academic tutoring system, attendance and participation in academic classes and submission of coursework. Further guidance on the policy on and procedures relating to academic engagement and fitness to study can be found on the Centre for Quality Support and Development website:

💻 Policy on and procedures relating to student academic engagement and fitness to study

💻 Policy on and procedures relating to extenuating circumstances

Working with academic integrity

'Academic integrity' describes the values held to be essential in university study in the UK. The five core values we work to are:

- **Accuracy** – making sure that your work is free from errors.
- **Honesty** – being truthful about which ideas are your own and which are derived from others, and about the methods and results of your research.
- **Fairness** – not trying to gain an advantage by unfair means: for instance, by passing off others' work as your own.
- **Responsibility** – taking an active role in your own learning: for instance, by seeking out the information you need to study effectively.
- **Respect** – for your fellow students, your tutors, and the work of other scholars.

(Adapted from International Center for Academic Integrity (1999), *The Fundamental Values of Academic Integrity*, online at https://goo.gl/NGk1sM, accessed 8 Aug 2018.)

What does this mean for my academic writing?

You practise academic integrity in your academic writing by working with the five values in mind, and particularly by using correct and accurate referencing. This shows that you can: be **accurate** in transcribing details; be **honest** about which ideas were derived from others; act **fairly** by not taking credit for others' work; take **responsibility** by finding out what is required of you and how you should carry it out; and show **respect** for others by acknowledging the part they have played in building your knowledge and understanding.

How does this differ from what I did at school/college?

You may have used a simplified referencing system at school or college, with only direct quotes given citations, or no in-text citations but only a bibliography. At university, you need to give a citation whenever you refer to an idea that you derived from a source. This is the case whether you use a direct quote, a paraphrase, or just a mention. There are many different styles of referencing, and you will need to find out which one is used in your

School and how to set out your citations and lists of references. You will need to learn how to cite a variety of sources correctly and get into the habit of doing this accurately and with attention to detail. Different module convenors may have different requirements. We are comfortable with this because it gets you used to the idea that there is not one way of doing things, but conventions that differ between academic disciplines and different kinds of publication.

Incidentally, a bibliography is a list of sources that related to a topic, such as a reading list. By contrast, a list of references is a list of only those sources used in a specific piece of work. While some people are rather loose with the terminology, you need to ensure that you understand what kind of list is required for each piece of work you do.

I have not studied in the UK before; how might this differ from my previous experience?

In the UK, critical analysis and building new knowledge are key aims of academic study at university. This means you will be expected to read widely to gather a range of ideas, be critical by questioning everything you read and hear, and draw your own conclusions. You then need to support these in your writing by reference to what you have read, and to acknowledge the sources with correct citations.

We welcome students from a wide variety of backgrounds, with very different experiences of education. For example, many students who come to study here are have experienced of education systems where they have routinely received marks of 90% or more for excellent work. It can be a bit of a shock to receive a mark of 70% for a piece of work in which you feel you have excelled. Please be aware that in these programmes, we see 65% as a very good mark, and anything above 70% as excellent. If you are getting marks in the 60s and 70s, you are doing well. It is not useful to be comparing your marks to those you received at school or at an undergraduate level in another country. The pass mark in MSc programmes here is 50%, but you do not have to pass every module (please see page 82).

Developing good learning practices

It is very important to develop a reflective and critical approach to your learning. We do not expect your written work to simply relate what you have been taught. Instead, we expect you to use that as a basis for developing your own thinking and weighing up alternative views. We expect a certain amount of scepticism in the way that you approach any source material. Think about the evidence they used and how they analysed it, for example.

Organise your time. One way to do this is to look at the number of credits in each module. The module description form will tell you how many hours of study we expect a module to occupy. You will see that the bulk of your study time is not in classes. Allow time for preparing assignments that is proportional to the number of credits each assignment will earn you. The MSc is 180 credits of study, which means we expect you to be studying for 1,800 hours in total. Plan your time to ensure that you will be able to achieve what is expected of you in the time you have available.

Maintain your interest in the subject by reading widely, taking note of developments reported in the news and on-line. Develop networks of contacts through Linked-In and other networking sites.

There is no substitute for a healthy diet, regular exercise and drinking plenty of water. These factors can have an enormous impact on your capacity to study and learn.

Working together

The University encourages you to learn from each other, so when working together it is important to work with academic integrity. Learning collaboratively and sharing ideas can be extremely effective. However, you need to be honest and fair. For individual assignments, such as essays or reports, whether undertaken as part of group work or otherwise, discussing the general topics together is fine, but if you are submitting individual pieces of work, the assignment itself should be planned and written up separately and individually. For mathematical and computing problems, or data analysis, discussing the best approach to the problem can lead to you selecting the same methods as your peers, and your work can naturally end up looking quite similar. However, you should complete the stages of the method and any working out yourself. It is not acceptable for one person to do the calculations and for the rest of the group to simply copy them.

If you are in any doubt about what is acceptable when working together, you should ask your lecturers.

Group work

A lot of the modules in these programmes involve group work of one kind or another. Various aims are fulfilled through group work. It would help you to be aware of what these aims are, so that you can make the most of the opportunities afforded to you. In group work assessments it is likely you will be asked to submit a joint assignment that will be clearly acknowledged as being produced by the whole group. Part of the assessment will involve how you manage the group process and divide tasks between the group members. People do not need to do the same amounts of work, but the group does need to take collective responsibility for being honest, fair, and for showing respect to each member of the group.

Working in groups with students from diverse backgrounds is immensely challenging. There are differences between students in terms of levels of experience, educational attainment, language skills and culture. The first thing about this cultural diversity is that most professional institutions require evidence of experience in diversity, inclusion and team-working attributes.

Sometimes, students are invited to put themselves into groups. But, quite often, you will be assigned to a group. It may be that the module convenor wants to ensure that there is a good spread of students in each group, whether by nationality, mode of study or simply by random allocation. There are reasons why different module convenors do this in different ways and we encourage them to explore the use of group work as they see fit.

Whichever criteria are used for allocating students to groups, it is going to be stressful and difficult to achieve the aims of group work because of the differences in background and experience. We are aware of these difficulties. They are good practice for future working in the construction industry, where you never get to select who you are working with but have an overriding imperative to work together and deliver the required outputs. In industry, multi-cultural teams are common. The university environment is a good place to rehearse these skills.

In any group work situation, you will probably need to get to know each other before starting the work. This is not only to do with getting to know each other's names and origins, but also an initial assessment of skills, strengths and weaknesses. You will need to split up the tasks and allocate them. Sometimes, the group work is such that it makes no sense for each group member to do part of the whole task. Simply sharing the work out so that you all must exercise the same skills is one way of doing it. But it is rather simplistic. Another way is to think about roles required in the task, so that each person takes on a distinct role that plays to their strengths. Therefore, it is useful to think about the skill set of each group member. Be prepared for this by getting to know your own strengths and weaknesses in group work. When allocating work and setting milestones for managing progress, allow for time slippage and think about tactics for dealing with non-performers. The whole team must work together. This may mean providing support to someone who is struggling to understand what is needed or struggling to make timely progress. A group that works together and helps each other is going to achieve a lot more than a group that seeks to blame poor performance on each other. You can take responsibility, if you choose.

Effective reading leads to higher grades

Whenever you are reading anything, especially if you are thinking of relying on it, ask yourself who wrote it. How credible is the source? Think about what it is about the item that is persuasive. Just because something has been written and published, does it mean that it is absolutely and permanently correct? Is it applicable in all circumstances and places? Is the author someone who is well-known in the field and often cited by others? Is the item in a peer-reviewed publication that has been vetted by independent experts in the field? It is not easy to establish the credibility of source when you are new to studying but it is extremely important. For a simple rule of thumb, do not use websites as authoritative sources. The processes of formal publication involve more checks than writing something for the web.

Having ensure that the source is credible, it is then important to focus on the conclusions of a paper. What were the assumptions that they started with? What were the questions they were dealing with and do they match the question that you are dealing with? What methods did they use in carrying out their work? What did they actually do in their work that enabled them to draw the conclusions that you find so persuasive? What do you think of the quality of their argument? How do they establish their position on the issue and what does this tell you for how you establish your position? Above all, make notes when you are reading. Do not simply highlight sections of the paper that seem to be interesting. This may lead you to simply paraphrase or quote sentences from a serios of papers without really understanding the meaning. If your writing involves a series of paraphrased ideas from sources, this is known as "excessively derivative work". It does not earn good marks. It is likely that such habits arise from the way that students read in their preparation. So, read with a notebook by your side and make notes from the items you read, using your own words, not the author's. Later, when you come to write up, you will be less tempted to merely reproduce what appeared to be good phrases from the source material. This is part of how we develop the all-important "critical thinking" skills that an MSc graduate is expected to have.

Effective writing leads to higher grades

It is extremely important to put your ideas across clearly. There are many good books about effective writing. They are generally an enjoyable read, because they are written so well. One good example is Turk, C. and Kirkman, J. (1989) *Effective Writing: Improving Scientific,*

Technical and Business Communication, 2nd ed. Taylor & Francis, London. This is available in electronic form in the library.

If you want to get a flavour of what it means to think about style when it comes to writing, have a look at George Orwell's essay, *Politics and the English Language*, from 1946[1]. Much of this still holds true, and there is plenty of excellent advice in there.

Effective writing is achieved through developing a style that makes your writing informative and interesting. One of George Orwell's suggestions is particularly relevant; that good writing should be about choosing the right words to fit the ideas, rather than stringing together a series of stock phrases. Too many writers string phrases together, often riddled with worn out clichés and inappropriate idioms. Writing should be about choosing words, rather than phrases.

Here are some rules of thumb that may help with the task of putting your thoughts together. But these rules are not sacrosanct, merely suggestions:

- The first thing, and an extremely common fault, is punctuation, especially apostrophes, commas, colons and full-stops. It seems that many people do not know how to use apostrophes. Basically, never use an apostrophe to make a plural, e.g. cars, roads, 1960s, etc. Always use one if the *s* is being added to indicate possession, e.g. *John's sensitivity*, *the client's requirements*, *several clients' requirements*. As you can see, if the possessive case is singular, the apostrophe is placed before the *s*, if it is plural, the apostrophe is placed at the end of the word. Commas should be used to separate elements and clauses in a sentence, or items in a list. They are not 'breath marks'. Colons and semi-colons are often mixed up. The former introduces a list or an idea; the latter separates closely related independent clauses. Most people know how to use full-stops; they just don't use enough of them. Short sentences are easier to compose and understand than long ones.
- Long words are more difficult to understand than short ones. They may be more difficult to translate, too. Generally, never use a long word where a short one will do. For example, change *utilize* to *use*. Avoid fashionable terms and jargon, unless you can be specific about the meaning.
- Sentence length should be variable. For example, this sentence and the next illustrate how some sentences can be quite long, preparing the reader for a point that is about to be made by setting out information that forms the context for the point. Others don't. Thus, a two-word sentence can be used to great effect, if the preceding sentence has done the work. If in doubt, stick to one idea per sentence. Avoid long sentences.
- Sentences are usually grouped into paragraphs, each of which represents a specific idea or step in the argument. Avoid single-sentence paragraphs. Such writing ignores the important distinction between sentences and paragraphs. If a paragraph should have a beginning, a middle and an end, it is extremely unlikely that all three functions can be fulfilled by one lonely sentence.
- Similarly, a series of paragraphs is grouped together under a sub-sub-heading and so on, up to the main headings. Try not to use more than three levels of heading, sub-heading and sub-sub-heading otherwise you will confuse your reader.

Using these rules of thumb helps to make your writing understandable. Split the argument into headings, then each heading into sub-headings, then each sub-heading into sub-sub-headings, then you can write the sentences and the text will flow with ease. One final tip:

[1] http://www.orwell.ru/library/essays/politics/english/e_polit

although PowerPoint is designed for making business presentations, it is extremely useful for getting the initial structure of a paper sorted out into headings, sub-headings and sub-sub-headings.

Editorial and proof-reading services

Students who feel that they need assistance in writing appropriate English should, in the first instance, seek guidance from their School, which should discuss with the student their difficulties and, where appropriate, refer the student to the University's Study Advisors. Students whose first language is not English should check the resources at http://www.reading.ac.uk/islc-in-sessional-introduction.aspx.

Students who use software for assistance with proof-reading or with editing their work, or who seek assistance with proof-reading or with editing from third parties, should be alert to the major risks associated with such intervention, including the distortion of intended meaning and the failure to use technical terms appropriately. However, it is a good idea to seek help if your English needs to be improved.

Students are warned that any use of third-party proof-reading or editing services must not compromise their authorship of the work submitted. You must ensure that the substance of work is your own. Students are also warned that they will be held responsible for work which they submit, and that the use of third-party services will not be accepted as mitigation for any deficiencies in the work. The use of any third-party proof-reading or editing must be acknowledged in a written statement included in the submitted work.

💻 Information on the use of editorial and proof-reading services

Academic misconduct

The University takes academic misconduct seriously and it is your responsibility to make yourself aware of, and comply with, the contents of the policy below.

💻 Policy on Academic Integrity and Academic Misconduct

Copying

It is clear to all that, if a student is asked to do a piece of work, then simply copying all or part of someone else's work is not acceptable: copying is cheating and regarded seriously as academic misconduct. More importantly, perhaps, it is not sensible. If there is a purpose in asking a student to do a piece of work; it will be to promote or assess the student's learning and copying contributes nothing to that purpose. Equally, you should never employ anyone to write an essay for you: this is a variant of copying.

Falsifying data

Falsifying data, evidence or experimental results is another form of academic misconduct.

Plagiarism

For the purposes of the University regulations, plagiarism is defined as the fraudulent representation of another's work as one's own. This applies whatever the source of the material (for example, a published source, the web, or the work of another student),

whether the material is copied word for word or paraphrased, and whatever the extent of the material used. Wilful and deliberate disregard for good academic practice in respect of attribution of material will be construed as plagiarism.

How can you avoid plagiarism?

You should be aware that is possible to act in ways which look like plagiarism, even though they are not fraudulent, and it may be hard to convince others that your actions were innocent. For this reason, you should never download essays from any website. If you use material from the web you should acknowledge it, just as you would in the case of materials drawn from books. Better still, use authoritative sources, rather than other students' work. The general rule is to simply avoid copying text into your submitted work.

Avoiding Unintentional Plagiarism

Plagiarism is when someone else's work is passed off as your own. It may include:

- Using someone else's words directly without accurately acknowledging their authorship (whether this is from a published source or another student)
- Using ideas from someone else's work without accurately acknowledging their source
- Colluding with another student to produce the same or similar work
- Passing off someone else's original work (e.g. a commissioned essay) as your own

Although you may be thinking that you would never be so dishonest, it is possible to commit plagiarism unintentionally. Unintentional plagiarism can happen if:

- You are not careful about recording details or note-making
- You do not learn how to cite references to comply with university standards
- You do not fully understand the role that references play in your academic writing

These errors also put you at risk of committing poor academic practice. This is the term used when you produce work which may be fully referenced, but (for instance) relies too heavily on only one or two sources or is generally too derivative (includes too many words quoted from other people and not enough of your own analysis and exposition), or is inadequately paraphrased (too close to the original).

Both plagiarism and poor academic practice leave you liable to penalties which may be determined at a School or University level. These can range from a substantial reduction in your marks (or even a mark of zero) which can affect your final degree classification, to a formal misconduct hearing which may result in your being asked to leave the University.

Things you can do to avoid unintentional plagiarism

Further advice on avoiding unintentional plagiarism, along with a guide to building references into your writing, can be found in the Academic Integrity Toolkit or by contacting the Study Advice Team.

💻 Academic Integrity Toolkit

💻 Study Advice Team

- Read your feedback carefully – if your referencing has been criticised, find out what you are doing wrong and put it right before your next submission. A 'second offence' may be treated much more seriously, even if it is for another marker.

- Develop good note-making and record keeping practices – be thorough and accurate, avoid doing 'cut and paste' research, read a paragraph then write in your own words what you have understood and how it relates to your assignment brief.
- Find out when you need to use a citation – acknowledge every idea you get from your research – not just direct quotes.
- Understand how to use references to support your discussion – referring to other people's work and showing how it helped to build your own ideas is a way of sharing your research journey and situating your work in the body of work in your discipline.

Understanding plagiarism: examples of good and bad practice in using written sources

It is important that you understand how to use and acknowledge written sources in your work. The following examples are designed to illustrate and explain the differences between unacceptable practice, poor practice, good practice and better practice.

Original text:

> *There is no convincing reason to suppose that the remains buried in the Folly Lane enclosure were not that of one, adult, individual; in view of the nature of the pyre goods this was probably a man.*

R. Niblet (1999) *The Excavation of a Ceremonial site at Folly Lane*, Verulamium, London: Britannia Monograph 14, p.412.

Unacceptable practice

(1) 'Prototypical' plagiarism: lifting a section of text from another source without any indication of the source, and is unacceptable:

> *Unlike the 'family' burial enclosures at King Harry Lane, there is no convincing reason to suppose that the remains buried in the Folly Lane enclosure were not that of one adult individual, in view of the nature of the pyre goods this was probably a man. This difference suggests…*

(2) Changing the order of a few words does not constitute acceptable paraphrasing:

> *Unlike the 'family' burial enclosures at King Harry Lane, there is no clear reason to suppose that the remains buried in the Folly Lane enclosure were anything other than that of one adult individual, in view of the nature of the pyre goods the gender was probably a male. This difference suggests…*

(3) It is best not to use even relatively short phrases without marking them as quotations. While one might pass un-noticed, this can become a matter of habit, so is best avoided in the first place. Again, the failure to acknowledge the source is a problem:

> *Family burial enclosures have been found at King Harry Lane. But at Folly Lane there is no convincing reason to suppose that the burial is of anything other than one individual. Probably a man in view of the nature of the pyre goods. This difference suggests…*

Further advice on how to paraphrase can be found in the "Using References" section of the Academic Integrity Toolkit.

💻 Academic Integrity Toolkit

Poor practice

(4) Mentioning the author's name, but not marking quotations is still barely acceptable, as is still representing other's words as your own. At least you have said where the idea/material comes from, though not using a proper referencing system:

> *Unlike the 'family' burial enclosures at King Harry Lane, there is no clear reason to suppose that the remains buried in the Folly Lane enclosure were anything other than that of one adult individual, in view of the nature of the pyre goods the gender was probably a male, in the view of Niblett. This difference suggests...*

(5) Better would be at least providing a complete reference, though this still does not make unmarked quotations or slight re-phrasings acceptable:

> *Unlike the 'family' burial enclosures at King Harry Lane, there is no clear reason to suppose that the remains buried in the Folly Lane enclosure were anything other than that of one adult individual, in view of the nature of the pyre goods the gender was probably a male (Niblett 1999: 412). This difference suggests...*

Acceptable practice

(6) Below the quotation has been clearly acknowledged and referenced. This is good. However, this is not to say that an essay significantly made up of quotations is acceptable, since we are looking for your voice, your ideas, and your interpretations. Quotations should ideally be used sparingly, only where they really succinctly sum up an argument, or where they are vital for the development of an argument:

> *Unlike the 'family' burial enclosures at King Harry Lane, 'there is no convincing reason to suppose that the remains buried in the Folly Lane enclosure were not that of one adult individual, in view of the nature of the pyre goods this was probably a man' (Niblett 1999: 412). This difference suggests...*

Better practice

(7) Paraphrasing other people's ideas is better, it demonstrates you have read their ideas; your mind has worked through them and encapsulated them into words of your own:

> *Unlike the 'family' burial enclosures at King Harry Lane (Stead & Rigby 1989), the burial at Folly Lane was probably that of a single male adult, or so the excavator argued from the pyre remains (Nibblett 1999: 412). This difference suggests...*

Best practice

(8) However, an essay that just comprises paraphrasing of other people's views can still result in a fairly derivative essay. The best practice overall is where you take other people's ideas and you intermesh them, rather than sequentially paraphrasing them. This demonstrates your ability to think comparatively, to be able to directly compare the work of different academics, and to be able to vocalise your own point of view:

> *Stead and Niblett came to very different interpretations of their own cemetery excavations at Verulamium. Stead's excavation at King Harry Lane exemplified the group homogenising aspect of burial of one tier of society, whereas Niblett's Folly Lane enclosure evoked separate treatment and disposal of one individual male. Both argued this from the remains of the funerary pyre goods found buried with the cremated remains (Stead & Rigby 1989, Niblett 1999: 412).*

Turnitin

You may have been told that your work will go through Turnitin when it is submitted, and wondered what Turnitin is. A common misconception you will hear is that Turnitin is a plagiarism checker. In fact, Turnitin is a tool which, if properly used and if your tutor enables it, can help you to work with academic integrity when you are referring to sources in your writing.

Turnitin is a program which checks your work for originality: that is, it searches through its database of published texts, webpages and student assignments to see if there are any areas which have a significant match to your work.

Turnitin is NOT a plagiarism detector. Your tutors will use Turnitin to alert them to possible problems, but they are also familiar with your writing and with the literature in your field, and they will use their experience and academic judgement to identify any issues with your use of references.

Further information on Turnitin can be found in the Academic Integrity Toolkit.

Consequences

Within the University, the most serious view will be taken of plagiarism and other forms of cheating. Any such case will be treated as a disciplinary matter. Minor cases may be dealt with at School level, but if the case is more serious it will be referred to the Senate Standing Committee on Academic Misconduct. The Senate Standing Committee on Academic Misconduct has the power to impose disciplinary sanctions, including a failure in all the assessments for a Year or Part of a programme or, in sufficiently serious cases, removal of the student from membership of the University.

Further advice on how to build references into your writing can be found in the Building references into your writing section of the Academic Integrity Toolkit:

💻 Academic Integrity Toolkit

References and citations

There are many systematic techniques for citing your references. In this School, our convention is to use the Harvard System[1]. It is an important professional skill to be able to cite references correctly. Many assignments include the correct formatting of references as part of the assessment criteria. Even when they do not, you are expected to be able to demonstrate your skills in citing references as a routine part of your professional approach to submitting formal assignments.

Even if you have experience of referencing and using citations in your previous educational experience, you will still need to read carefully the following advice. Do not assume that your previous experience will be adequate. Different conventions apply at different places and for different reasons. As well as the mechanical aspects of compiling lists of references

[1] http://libguides.reading.ac.uk/citing-references

at the end of your work, it is useful to pay attention to the way that you mobilise contrasting views and interesting research.

In many assignments, we are keen to ensure that students engage with ongoing debates in the research literature and that relevant work is cited and critiqued. We would like you to ensure that you have dealt with relevant previous papers that have been published in the key journals of the field. Not all journal papers agree with each other, and it is important to bring out the areas of controversy, if there are any. Therefore, include citation and critique of research papers that develop the underlying science and/or approach in your research. This can be particularly problematic in an applied field like ours. Researchers sometimes seem to assume that the construction sector is not part of the same world that the rest of us inhabit and, therefore, set out to re-invent the wheel. For guidance on how to undertake a critical review of a research paper, please see http://wp.me/p1J7za-el.

The citation of past research needs careful attention. When constructing an argument, it is common to use citations to other significant researchers as means of short-hand, because certain methodological stances, or particular approaches, or specific ideas, are strongly linked to particular authors' names, and a passing citation to the seminal work in which that idea, approach or stance was definitively mentioned is a routine part of setting out an argument. But this kind of academic shorthand should not be confused with a critical review of past research upon which a research paper seeks to build. There will be citations in your paper that require more comment because of their importance to the work you have reported. In these cases, use a sentence or two to explain what these people did to get them to the conclusions that you cite.

It is not very useful to pepper the text with arbitrary citations without making a specific connection to the construction of your argument. Avoid long lists of author names in brackets. Unless is it just a form of academic shorthand, explain why the work you cite is important. At the very least, your phrasing should make clear whether you are citing past research, guidance documents or polemical arguments, for example. It is useful to focus on the conclusions in a paper, rather than passing observations or introductory comments that an author has included to contextualise the work.

Developing learning practices

Starting a postgraduate programme means meeting high academic standards. This can involve a steep learning curve for both home and international students. The University's Study Advisers can help with every aspect of postgraduate study, so please feel free to consult them on:

- Writing assignments at an appropriate level
- Managing your dissertation
- Advanced referencing
- Coping with lots of material and a fast pace of learning
- Using academic theories to support your writing
- Adjusting to new academic expectations and culture
- Time management
- Research methods

Taking time to address any study concerns now can really save time later, allowing you to develop your study practices before beginning a long piece of research or a dissertation.

The Study Advisers offer confidential one-to-one advice sessions which usually last 30 minutes. They are very happy to book one-hour sessions for postgraduate students, because there is often longer and more complex work to discuss. If you would like a one-hour session, then please mention this when you book. Appointments are available every day during term-time and most days during vacations. Details of how to book an appointment with the Study Skills Advisors are available at: www.reading.ac.uk/studyadvice. Alternatively, send an email message to studyadvice@reading.ac.uk with your details including a phone number and they will get back to you.

Workshops, online study guides and paper study guides are available. See the website for study guides and more information on workshops: www.reading.ac.uk/studyadvice/. They also offer advice, support and assessments for specific learning disabilities (including dyslexia, dyspraxia, AD(H)D. To discuss any of these, please book an appointment).

The Reading Student Charter explains our expectations of each other, please see Page 4.

Research training

The research skills and dissertation modules in each programme are specifically focused on research training. In these modules, students learn about independent study, including how to define a research question, carry out a literature review, research design and empirical work. Further details can be found in the module summary for the relevant dissertation module at the beginning of this handbook. You will be provided with detailed guidance and a comprehensive dissertation handbook in the relevant module area of Blackboard. The Research Skills modules includes the relevant postgraduate research training element of your programme

Coursework

Information on any module coursework assignments you need to complete, along with submission dates and methods can be found on the module's Blackboard course. It is your responsibility to make yourself aware of all your assignment deadlines and to ensure you understand how to submit each piece of work. It is important you familiarise yourself with the following policies and how they relate to coursework. If there are circumstances beyond your control that prevent you from carrying out your work, please follow the procedures for extenuating circumstances.

💻 Policy on Penalties for late submission (excluding Postgraduate Flexible Programmes)

💻 Guidance on extenuating circumstances

💻 Policy on and procedures relating to extenuating circumstances

Feedback and marks

Each module will be assessed through assignment work. (There are one or two modules that involve an examination in the Summer Term. This is made clear in the Module Description Form). Assessment may differ between modules. Some examples may illustrate the variety:

- A single written assignment to be submitted some weeks after the module classes.

- A main assignment to be submitted some weeks after the module classes, with a short assignment submitted within the module week.
- A main assignment plus some on-line tests, all to be submitted some weeks after the module classes.
- A main assignment to be submitted some weeks after the module classes with a smaller assignment or some on-line tests submitted very soon after the module classes.

By "some weeks" after the module classes, we mean (generally) five weeks for full-time students and eight weeks for flexible-modular students. Vacation weeks are generally not included in this period. Some modules, especially at the beginning of the programme, may have a shorter submission period. Extra time is added in the case of dates that cross the Christmas break and Easter breaks and Bank Holidays. There are sometimes needs for module convenors to depart from this convention, but please feel free to ask about submission dates at the time you are informed of them. For your convenience, there is an online calculator that can be used to find out likely submission and feedback dates at https://willhughes.work/dates.

It is the University's intention to provide feedback which can be used positively to affect your future performance. It is therefore important that you consider your feedback in detail and take the opportunity to discuss it if you have any queries.

For all undergraduate and taught postgraduate programmes, the standard turnaround time for individual feedback and marks on coursework and in-class tests is a maximum of fifteen working days from the deadline for submission/date of the in-class test. The policy applies equally to work from full-time and part-time students.

For the purposes of this policy, a working day is defined as excluding Saturday and Sunday. This definition applies to all students, regardless of location. Public/national holidays in the country where the relevant module is being delivered and University closure days are not normally considered to be working days. When setting deadlines for submission of coursework, module convenors should take into consideration public/national holidays in the country or countries where staff who will be responsible for marking and provision of feedback are located. For UK campuses, the University is normally closed on the eight Public Holidays for England and Wales (New Year's Day, Good Friday, Easter Monday, May Bank Holiday, Spring Bank Holiday, Summer Bank Holiday, Christmas Day and Boxing Day). It is also normally closed for a small number of additional days during the year, referred to as 'closure days', usually around the Christmas and Easter public holidays. See term dates for further details.

Some assessments may be exempt from the fifteen working day turnaround time feedback requirement. The following assessments are exempt, subject to the proviso that work submitted in the summer term of the Final Part should be returned prior to graduation:

- dissertations;
- assessments where there is input from a professional external body that might unavoidably delay the marking process;
- assessments where for logistical reasons there are staggered submission dates (e.g. practicals).

For more information see:

💻 Policy on providing feedback to students on their performance

Specific SCME programme practices

This section contains advice and conventions that you might find helpful.

Guidance on drafting email messages

There are some basic habits that are worth developing while at the University. These will also be helpful to you after you in professional life. Every form of communication has some kind of etiquette and email is no exception.

- Use the subject line: When you send an email to anyone about a specific issue, please always put a short description of the issue in the subject line of the email. This is not the place to insert your name or ID. If you are writing about a specific module or lecture course, use the code. If you are writing about a programme, give the name of the of the programme.
- Greeeting: At the beginning of the email, begin with the addressee's name. Emails are less formal than letters, so it is usually OK to begin with "Hi", if you are not addressing a named individual. If you are addressing a named individual, do not begin with "To whom it may concern". Further details on addressing staff are given in the next section.
- In composing your text, assume that your correspondent deals with many people other than yourself: Many of my colleagues are involved with a wide variety of programmes, modules, courses, and cohorts of students. Not all students are studying the same thing. It is useful to spell out a little bit of detail in what you are asking, rather than assuming that your correspondent knows exactly who you are and what is on your mind. Get to the point quickly and avoid wasting words. What is your question? Why are you asking it? Use clear English. Are you using acronyms that only make sense in a specific context? Be accurate with ID codes and names. Be clear about what you are asking for.
- Signature in email: At the end of an email, after "Best wishes" or "Kind regards", write three things, one per line. First, your name. Second, under your name, on a new line, add any personal identifying number that could be relevant. For example, if you are a student, you may have a student number (not your username, which may be a different thing). If you have previously enquired, you may have a reference number. Third, under your reference ID, write the name of the programme and, preferably, the cohort you commenced in, for example: MSc Construction Management (2016-17), or BSc Building Surveying (2018-19). If you are writing to apply for a place on a programme, name it in a similar way. If you are writing on behalf of an organization company, write the name of the organization here.

Addressing academic staff

When writing an email to a member of academic or administrative staff, please always put your name at the end of your message, followed on a new line by your student number (not username) and then a third line with the name of your MSc programme, including 'full-time' or 'flexible' after the programme name). (You may find it convenient to set this up as one of your 'signatures' in your email software.) Here is an example:

```
Jane Doe
99996373
```

`MSc Construction Management (full-time)`

If you are emailing in relation to a specific module, please put the module code (all module codes in this School commence with three letters, CEM, and have six characters, no spaces) as the first part of the subject line. Don't forget to add a couple of words after the module code to indicate the topic of the email. This helps people with large volumes of email to re-locate your email in the future.

When addressing a member of academic staff, it is customary in the UK academic practice to use forenames, as follows:

`Dear Roger`

However, if you wish to retain a level of formality, do not simply write '`Dear Mr Roger`' or '`Dear Professor Roger`'. If you want to be formal, you should use the surname, not the forename, and the correct title (Mr, Ms, Dr, Prof), depending on whether they hold a PhD, a professorship or not. You may check the qualifications and titles of each member of staff in the School's web page at http://bit.ly/SCME-staff. If you are unfamiliar with naming conventions in the UK, please note that the given name(s) comes first and the family name last. Your experience of names may be different, depending on which country you come from, so please pay particular attention to how names are presented. For further guidance on naming conventions, please see https://en.wikipedia.org/wiki/Personal_name.

Guidance on sending email messages

Here are some useful pointers about sending email messages.

- It is useful to think of email as an electronic letter, rather than a written telephone call (it is *email*, not *ephone*!). This means that you should not assume that the reader of your message may not open your message the moment you send it. Thus, it is best **not** to begin an email with "good morning", "good afternoon" or "good evening". It gives a rather self-important or presumptuous impression that you are expecting an instant response.
- Never apologise for sending an email, since the person receiving it makes a conscious decision about whether they wish to access their emails or not. Anyone can choose to switch notifications on or off.
- Please do not assume that staff are on holiday when there are no classes. Making such an assumption may come across as rude. Staff do not get holidays when the students do.
- If you do not get a response from an email within three days of sending it, please follow these suggestions:
  - Three days after sending the first message, please re-send it with a polite extra line, such as, "Sorry for re-sending this message; I am not sure whether my earlier message got to you."
  - If this does not get a response after three further days, please re-send it with a similarly polite explanation for re-sending, but this time also add the relevant module convenor in the CC field. (You can find the module convenor's name on the MDF or in this programme handbook.)
  - If you still get no response after a further three days, please re-send but also CC the relevant programme director.
  - If this does not work, please add the School Director of Postgraduate Studies to the CC field.

    - At each point, please retain a professional and courteous tone. Remember, there may be other demands on the people you are writing to, despite our desire to be responsive to everyone.
    - Please also observe out-of-office messages if the person you are writing to is on leave or absent due to illness.
- If you are unsure of anyone's email address, you can find them on the University web site.

Accessing information on modules and programmes

Information is also provided electronically using the Blackboard Learn portal (www.bb.reading.ac.uk), where you can find detailed information on modules and School-specific information; the RISIS web portal (www.risisweb.reading.ac.uk), where you can find personal information about your enrolments and other data; and Essentials (student.reading.ac.uk/essentials), which contains a lot of advice about being a student here.

Teaching staff and students are expected to check their email accounts, Blackboard Learn portals and other electronic methods of communication daily during term-time and respond to messages as appropriate, within three days. Students are also required to check their University email accounts daily.

While the University does not recommend it, you may set up forwarding arrangements to automatically send email received in your University account to another email account of your choosing; however, you do so at your own risk and you should ensure that you forward to a valid and existing account. The University can only be held responsible for email reaching your University email account. If an email has been sent without apparent problem to your University account, the sender may reasonably assume that you will receive that email. If you do wish to forward email from your University account to a private account, you can do this by changing your email options. It is advisable for a copy of the email to be delivered to (and stored in) your University account as well by including your University email address on a separate line under your personal email address in the mail options.

Unless otherwise instructed by the School, you should not submit coursework using email.

Assignment brief issue dates

In some modules, assignment briefs may be issued at the beginning of the module. This can be useful to enable students to focus their learning while they have access to the lectures and tutors. However, this is neither appropriate not possible in all modules. It may happen that an assignment brief is issued at the end of a module. Sometimes, it is entirely appropriate to avoid issuing the brief at the beginning, whether to allow the module convenor to be responsive to the learning that took place in the particular week, or to cover the whole module in general terms before focusing on to the specifics of one topic within the module. Focusing directly and solely on the assignment can be quite counter-productive in the learning process. Therefore, we expect that there will be different practices in different modules for very good reasons.

Timetables published in Blackboard portal

To enable all students to see all detailed MSc module timetables, the timetables should be published in the Blackboard PG Student portal, not in the module area. There are sometimes enrolment problems in Blackboard and using the portal for the timetable enables students to have access to the timetable before a module is opened for access.

Your timetable holds information on all the classes you need to attend as part of your programme. This includes lectures, seminars, workshops and any other events which form part of your programme. Information on how to access details of the room bookings and timings for your classes, syncing these to your phone, along with help and support can be found on the Essentials website at http://student.reading.ac.uk/essentials/_study/your-timetable.aspx

Programme assessment

Requirements for award

MSc degrees may be awarded with the following classifications:

- Pass with Distinction
- Pass with Merit
- Pass

The Marking Criteria and Classification Framework for Taught Postgraduate Programmes may be found at:

💻 Assessment of Awards for MSc, PGdip and PGCert

These explanatory notes are intended to explain the rules set out in the formal requirements. Students on earlier programmes must read their programme handbook carefully to check for differences. These guidance notes are to supplement and explain the rules, not to replace them. If there is a difference between these notes and the rules, then the rules will prevail.

MSc Pass

- 50% or more for dissertation.
- An overall weighted average of 50% or more. (Alternatively, an overall weighted average of 48 or more with 90 or more credits at 50% or more.)
- 50% or more in 130 credits (i.e. it is acceptable to have marks in the range of 40-49 in up to 50 credits, provided that the overall weighted average is 50% or more).
- 40% or more in 150 credits (i.e. it is acceptable to have marks in the range of 0-39 in up to 30 credits, provided that the overall weighted average is 50% or more).

MSc Merit

- 50% or more for dissertation.
- An overall weighted average of 60% or more. (Alternatively, an overall weighted average of 58 or more with 90 or more credits at 60% or more.)
- 60% or more in 130 credits (i.e. it is acceptable to have marks in the range of 50-59 in up to 50 credits, provided that the overall weighted average is 60% or more).
- No mark below 40%.

MSc Distinction

- 60% or more for dissertation.
- An overall weighted average of 70% or more. (Alternatively, an overall weighted average of 68 or more with 90 or more credits at 70% or more.)
- No mark below 40%.

If the marks do not warrant the award of an MSc, a Diploma or Certificate may be possible.

Diploma award

The formal text for setting out what has to be achieved for the award of a Diploma may be unpacked as follows:

- It is not necessary to pass the dissertation as part of the 120 credits.
- Three of the ten-credit core modules must be included in the calculation.
- Any combination of modules that totals 120 credits may be used in the calculation provided that three of the ten-credit modules are included.
- An overall weighted average of 50% or more over the 120 credits. (Alternatively, an overall weighted average of 48 or more with 60 or more credits at 50% or more.)
- 50% or more in 60 credits (i.e. it is acceptable to have marks in the range of 40-49 in up to 60 credits, provided that the overall weighted average is 50% or more).
- 40% or more in 90 credits (i.e. it is acceptable to have marks in the range of 0-39 in up to 30 credits, provided that the overall weighted average is 50% or more).

Diploma with merit

- It is not necessary to pass the dissertation as part of the 120 credits.
- Three of the ten-credit core modules must be included in the calculation.
- Any combination of modules that totals 120 credits may be used in the calculation provided that three of the ten-credit modules are included.
- An overall weighted average of 60% is required over the 120 credits. (Alternatively, an overall weighted average of 58 or more with 60 or more credits at 60% or more.)
- No mark below 40.

Diploma with distinction

- It is not necessary to pass the dissertation as part of the 120 credits.
- Three of the ten-credit core modules must be included in the calculation.
- Any combination of modules that totals 120 credits may be used in the calculation provided that three of the ten-credit modules are included.
- An overall weighted average of 70% is required over the 120 credits. (Alternatively, an overall weighted average of 68 or more with 60 or more credits at 70% or more.)
- No mark below 40.

Certificate award

To obtain the Postgraduate Certificate a student must take 60 credits consisting of at least three compulsory core modules (not including [the 60-credit dissertation or 40-credit integrating module]). To pass the Certificate students must gain an average mark of 50 or more over the 60 credits. In addition, the total credit value of all modules marked below 40 must not exceed 10 credits.

- It is not expected to pass the dissertation as part of the 120 credits.
- Three of the ten-credit core modules must be included in the calculation.

- Any combination of modules that totals 60 credits may be used in the calculation provided that three of the ten-credit modules are included.
- An overall weighted average of 50% is required over the 60 credits.
- 50% or more in 50 credits (i.e. it is acceptable to have marks in the range of 40-49 in up to 10 credits, provided that the overall weighted average is 50% or more).

Note: A module cannot be credited for more than one award.

In the case of finalists who are in debt to the University in respect of tuition-related charges (e.g. tuition fees, re-examination fees, field trip costs, and library fines; but not accommodation costs or parking fines), no recommended result will be submitted to the Senate. In such cases, the result will be recorded as 'Result not yet available'. Students should discuss the situation with Student Services (undergraduate) or the appropriate Faculty Office (postgraduates). You should note that, if the debt has not been settled within 18 months of the decision that there be no recommendation, you will no longer be eligible for re-examination.

The assessment procedures for each module are given in the Module Descriptions at www.reading.ac.uk/module/.

Re-examination

Resits are available for any module that you fail. The examinations office will contact you to ask you if you want to accept the offer of a resit, usually in July of each year. The resit period for all assignments is five weeks from the date of submission of the dissertation. To ensure that dissertation work does not overlap with any requirements for resits.

💻 Section 28: Assessment Handbook - Policy on Reassessment

Appeals

If you wish to appeal for a review of your result for part of your degree or your final classification, details on how to go about this can be found on the Essentials.

💻 How to make an appeal

Submission of coursework

Coursework should be submitted by the due date in accordance with the arrangements specified by the lecturer who has set the work. Failure to submit the work by the due date will mean that a penalty is applied unless an extension to the date for submission has been granted or approval is given for removal of the normal penalty, by following the procedures for extenuating circumstances.

All coursework should be submitted electronically through Blackboard and Turnitin according to the instructions found on Blackboard. Turnitin is a tool that can be used to help assessors check students' work for improper citation and potential plagiarism. Work (assignments, reports or essays) entered into it will return an originality report, a review of textual similarity based on a comparison with online sources, an archive of previous submissions to Turnitin, and anything else in Turnitin's database. The report features a similarity index for the number of matches it has found during the comparison and can be

examined for signs of intentional duplication or poor referencing practice. The similarity index is only an indication of the quantity of text that matches other sources. It is not expected that this will ever be zero, since cover sheets, assignment titles, direct quotation of passages of text and properly formatted references will all appear to the Turnitin system to be directly reproduced text. Staff are expected to interpret Turnitin reports carefully. Further information on potential academic misconduct appears on page Error! Bookmark not defined..

We do not usually allow students to see their Turnitin score until after the submission date has passed. This is a deliberate policy because Turnitin scores are difficult to interpret and a zero score is not the aim. We do not want student to focus on minimising their Turnitin scores. Instead, avoid plagiarism!

The University reserves the right to retain coursework for the purposes of programme review (both internal and external) although any confidentiality will be observed. The School is currently exploring and developing procedures for making selected pieces of successfully completed coursework available on-line to current and future students.

Feedback to students

It is the University's policy that you should receive timely, structured and appropriate feedback on work which has a primarily formative purpose. Feedback will be delivered in a number of ways and contain comments appropriate to the nature of the assignment and how it is assessed. These comments should provide the basis for you to improve and develop. The member of staff or the School responsible for the module will tell you, at the time when a piece of work is set, if not before, the date on which the work will be returned with feedback.

For all taught postgraduate programmes, the standard turnaround time for individual feedback and marks on coursework and in-class tests is a maximum of fifteen working days from the deadline for submission or date of the in-class test. The policy applies equally to work from full-time and flexible-modular students.

Some assessments may be exempt from the 15-working day turnaround time feedback requirement. The following assessments are exempt, subject to the proviso that work submitted in the Summer Term should be returned prior to graduation:

- Dissertations
- Assessments where there is input from a professional external body that might unavoidably delay the marking process
- Assessments where for logistical reasons there are staggered submission dates (e.g. practicals)

For more information see:

💻 15-day feedback

If you would like feedback on your overall progress, module providers will give you an indication of your progress in an individual module, while feedback on progress on your programme will normally be given by your programme director.

Publication of marks and grades

You should be aware that marks and grades given to you during your degree programme are provisional and subject to moderation by the external examiner and by the faculty board, who may recommend changes either to the marks of a particular student or to those of a whole group. Therefore, marks only reach their final form after they have been scrutinised and approved by the appropriate examiners' meeting, which takes place at the end of the programme. Subsequent to this, there are further formal processes that must take place because it is the University that awards degrees, not the School.

Transcripts of marks provide information on all the courses taken, grades achieved and the degree that has been conferred. Since marks are only confirmed after they have been scrutinised and approved by the appropriate examiners' meeting, and ratified at higher levels of the University, full transcripts are not available until several weeks after the assessments are completed and examination boards have taken place. However, marks that have been entered into the student record system can be provided as a provisional record by the Student Support Co-ordinator in the Edith Morley Building.

Transcripts of marks

Students who need confirmation of their enrolment or confirmation of marks for the purposes of their APC assessment by the RICS should contact the Student Support Co-ordinator on the RISIS Portal by clicking on “Ask a question”, stating what they need, and why. Transcripts of results can be sent directly from SSC to the RICS, provided you give clear guidance about what you need, keeping in mind that all marks are provisional until after being ratified in various University processes. It is advisable to allow time for such administrative processes to take place, as SSC are dealing with a lot of students and must prioritise and schedule their work.

Students who owe money to the University will not be able to access their results until the clear their debt fully. Please do not ask academic staff to release your results informally to you.

Penalties for late submission

The following penalties will be applied by the module convenor to coursework which is submitted after the deadline for submission:

- Where the piece of work is submitted after the original deadline (or any formally agreed extension to the deadline): 10% of the total marks available for that piece of work will be deducted from the mark for each day up to a total of five working days;
- Where the piece of work is submitted more than five working days after the original deadline (or any formally agreed extension to the deadline): a mark of zero will be recorded.
- In the case of some minor pieces of work, a mark of zero will be recorded for late submission, even if the work is submitted within five working days after the original deadline. You will be informed if a piece of work is subject to this provision.

You are strongly advised to ensure that coursework is submitted by the relevant deadline. You should note that it is better to submit work in an unfinished state rather than failing to submit work. The formal statement on penalties for late submission can be found at:

💻 Penalties for late submission

(Please note that the exclusion for postgraduate flexible programmes mentioned in this policy does **not** apply to the flexible-modular programmes in this School. This is because the exception does not apply for modules that are taught simultaneously with full-time students, as our modules are. In such a situation, the School Director of Teaching and Learning is required to specify which policy applies. In our case, the policy that has been specified is the "standard penalties" policy. This has been confirmed by the School Board for Teaching and Learning.)

Formative assessment

You may be set coursework as a formative assessment, which allows you to benefit from feedback but does not contribute to the mark for the module. If you fail to submit such work by the deadline for submission, you forfeit your right to any feedback; in this case, it is entirely at the discretion of the marker whether to provide feedback.

Sometimes things don't go to plan – where to go for advice

💻 Support and wellbeing pages on Essentials

💻 Support Centres

💻 Academic Tutor

💻 Student Welfare Team

💻 Counselling and Wellbeing

💻 Disability

💻 RUSU Advice

H – Working together: how is my voice heard?

SSLC/School/Course reps

We have a well-established framework for student representation, where student views help to inform the services provided at School and University level.

Every School operates a Student Staff Liaison Committee (SSLC) whose role is to:

- provide a formal channel for students to meet with staff in order to discuss the operation of their degree programme(s)
- keep the aims and objectives of degree programmes under review
- review issues relating to teaching and learning, including assessment and feedback, module evaluation, curriculum development and student support receive and review copies of External Examiners' reports
- consider other matters affecting students, including health and safety and resources such as equipment and library provision.

The University also works closely with the Reading University Students' Union (RUSU), who provide advice and training to student representatives. Course Reps are elected students who represent you and your views on academic issues on your programme. They sit on Student Staff Liaison Committees and may also sit on the programme's Board of Studies.

School Reps give your feedback to the University and sit on the School Board for Teaching & Learning & Student Experience (SBTLSE). School Reps support and lead the team of Course Reps within each school.

Module and programme evaluation

The University actively encourages students to provide feedback on their degree programme and their experiences at Reading, through formal evaluation processes such as module and programme review.

💻 Policy on Student Evaluation of Teaching & Learning

Have your say: student surveys

We are committed to working in partnership with you to ensure you have everything you need to succeed during your time studying at Reading. That's why we take student surveys, such as the National Student Survey (NSS), so seriously. Your feedback helps us to better understand what's working well and where we need to improve. Our Vice-Chancellor, Professor Robert Van de Noort, and Heads of School read your comments to directly inform where we invest our resource to benefit future students.

All undergraduate final year students will be invited to complete the NSS between January and April, with alternative surveys shared with undergraduate non-finalists and postgraduate taught students. Thank you in advance for taking the time to share your thoughts.

💻 Essentials: Have your say

I – Making the most of my time at Reading

We hope that you do more than simply study while you are here. It is important for your development and your wellbeing that you get involved in a wider range of things.

Reading University Students' Union (RUSU)

RUSU is led by five Full-time Officers who are elected to their roles by the student body. The Full-time Officers run for election while studying, then take a sabbatical year from study or start after their graduation. The Student Officers listen to the views of the thousands of students on campus; they represent the student voice on campus, locally and nationally. They're accountable to all students.

Student Officers

Your elected full-time Student Officers are:

Diversity Officer – Zeid Sharif, Welfare Officer – Gemma King, President – Mollie Cleaver, Education Officer – Fifi Bangham, Activities Officer – Daisy O'Connor. Visit RUSU Officers webpage to find out more about your Officers and how to contact them.

As well as Full-time Officers, there is an elected team of 10 Part-time Officers. The Part-time Officers represent and liberate the rights of students who are less represented or discriminated against.

The Part-time Student Officer positions are: International Students' Officer, Mature Students' Officer, LGBQ+ (Lesbian, Gay, Bisexual, Queer and Questioning) Students' Officer, BAME (Black, Asian and Minority Ethnic) Students' Officer, Trans Students' Officer, Women's Officer, Disabled Students' Officer, Postgraduate Taught Students' Officer, Environment & Ethics Officer, Postgraduate Research Students' Officer.

There are a number of representative roles to put yourself forward for whilst at University. If you want to learn more about the different elected roles, or would like to find out how to run in a RUSU election, go to the RUSU Elections webpage.

Societies and sports

RUSU offers students the opportunity to become a member of a society; with over 100 there is plenty to choose from. If there isn't one for you, you can set one up! Joining a society can be a great way to develop your interests and hobbies. You can find out about RUSU societies by going to RUSU Activities webpage.

RUSU also supports the running of student sports clubs on campus. Many of our sports clubs compete on a national level in the BUCS League, but all clubs offer opportunities for those from all levels of experience. There are over 50 different sports to choose from. Many sports clubs even take part in Varsity, an all-sport event which runs every year competing against Oxford Brookes.

Go to RUSU Sport for a full list of teams and groups and find out how to get involved.

Volunteering

Volunteering is a fantastic way to not only give back to the community, but develop your skills, meet new people and improve your career prospects! You can find out more about the huge range of volunteering opportunities by visiting RUSU Volunteering webpage.

For more information, visit the RUSU website or follow us on Twitter @RUSUtweets and Facebook /RUSUnews. You can also drop by and visit us in the RUSU building located on Whiteknights campus.

RED Award

The Reading Experience and Development (RED) Award is the official University of Reading Employability Skills Certificate. It is here to help Reading students make the most of the extra-curricular activities and experiences on offer outside of the academic programme.

💻 RED Award

Partnerships in Learning & Teaching Projects Funding Scheme (PLanT)

PLanT projects involve staff and students working as partners to identify problems, find solutions, and enhance teaching and learning at the University. Projects can demonstrate a clear impact on the student experience.

💻 Partnerships in Learning and Teaching Projects Funding Scheme

STaR Mentors

STaR Mentors are current students that have been trained to help new students with their start at Reading. Mentors contact new students by email before they start and in person during the first term.

💻 STaR Mentors

Volunteering

Volunteering is an excellent way to help you make the most of your University experience. Whether you have a few hours to spare in the week or only have time to give at the weekends, there will always be a wide range of volunteering opportunities available.

💻 Volunteering

Students in Schools

The Students in Schools scheme places student volunteers in local schools, to help school children flourish and university students develop their personal and employability skills.

💻 Students in Schools

J – And finally…

Graduation

The graduation ceremony is an important event for the student and for the university. Some students look upon this as a lot of time wasted for three seconds on the stage and a handshake. If that were all there was to it, then it would indeed be an extravagant occasion for little purpose. But there is much more to this than a three-second handshake. There is a danger that the casual observer may devalue the sense of occasion and the importance of ceremony. We will organize a reception involving the other students and the academic staff of the School. There will be a prize-giving in that reception and a few speeches. The actual ceremony is, like any ceremony, a poignant punctuation mark in one's life. A nexus of events that happens only once and marks and end and a beginning, like most ceremonies. There is more to your graduation than the handshake. We want to make a fuss of you because of your success in your studies. By completing an MSc, you have become a little more exceptional and we want to acknowledge your exceptional qualities. We can do that without you if it is too expensive and time-consuming for you to be there in person, of course, but it is something of an empty gesture without you. But, if you are the winner of a prize connected with your achievement, and if you are travelling or working already and cannot get here for the graduation ceremony, please let us have an address where we can send you anything that we may need to send to you. Maintain your contact details in RISIS, so that the university can send you certificates and anything else that you might have earned.

Prizes

Each year, the teaching staff look at the performance of students from both the summer and the Christmas graduation ceremonies to determine which students have achieved the best results in various categories of performance, such as overall marks and dissertation marks, for example. The top performers are awarded a prize, involving a certificate and (usually) some money. The prizes are awarded at the Christmas graduation ceremony.

Graduations take place in July and December. Invitations to those expected to attend will be sent in early April for the July ceremonies and mid-October for the December ceremonies. All the information you will need for your graduation, including dates, and beyond can be found on Essentials.

💻 Your Graduation and beyond

Careers support after graduation

The Alumni Career Services support our graduates through the transition into work and study. We can help you navigate the tricky road to your dream job, career or any other options you may be considering. Perhaps most importantly, we offer all our graduates individual advice, guidance and support as an alumni of the University for up to 18 months after you finish your course.

💻 Alumni Career Services

Alumni: staying in touch

Your time here as a student is coming to an end, but this isn't goodbye, it's actually hello! That's because you're now part of a strong, supportive and successful alumni network.

💻 Staying in Touch

... or is it?

Continuing your studies at Reading

If you are considering staying at Reading to undertake a Doctorate degree, you can view information about PhD opportunities visit the Graduate School website.

💻 Graduate School

If you haven't found what you are looking for please refer to the following websites or visit your Support Centre:

💻 Essentials website

💻 The Assessment Handbook

💻 CQSD Teaching & Learning policy pages

💻 Support Centre webpages

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