

**MSc in Design and Management of Sustainable Built Environments (full-time)
For students entering in 2013/4**

Awarding Institution:	University of Reading
Teaching Institution:	University of Reading
Relevant QAA subject Benchmarking group(s):	
Faculty:	Science Faculty
Programme length:	12 months
Date of specification:	19/Sep/2013
Programme Director:	Dr Runming Yao
Programme Advisor:	
Board of Studies:	SCME Board of Studies for Postgraduate
Programmes and the Annual Review Panel:	
Accreditation:	CIOB and CIBSE following one graduating co-hort.

Summary of programme aims

The aim of this programme is to provide advanced understanding of the key subjects required for the design and management of modern built environments to meet carbon emission reduction targets. This is covered in six compulsory modules and a selection of optional modules that are offered within the School of Construction Management and Engineering. The compulsory modules will deal with the analysis, synthesis, design and assessment of modern, energy efficient environmental systems (including urban systems, and passive and active building systems), using analytical and computer simulation techniques. The choice of optional modules will offer the student the opportunity to study additional related topics to broaden their knowledge in environmental engineering and urban building design, design management, the application of digital technology, and urban and building sustainability. The targeted candidates will include architects, urban planners, developers, services engineers, building scientists, construction managers and facilities managers who already work in the construction industry and who have had industrial experience.

Because built-environment professions, such as urban planners, architects and engineers, are relatively compartmentalised and because there are differing perceptions of sustainability between policy-makers, built-environment professions, industry stakeholders and end-users, there are real challenges to developing a sustainable built environment. Unfortunately, there is little experience and knowledge of the ways to overcome these challenges and promote collaborative working between these different constituencies. However, this programme provides a range of modules which develop an overview of the reasons for such collaboration and the advantages in adopting them. Through the content of different modules students will be able to assimilate the range of topics necessary to analyse and synthesise solutions in sustainable built environment design.

The overall aim of the programme is to provide a knowledge and understanding of the principles which govern the design and management of the environmental services in sustainable built facilities. This will include the development of:

- A systematic understanding of knowledge, and a critical awareness of current problems and new insights.
- A comprehensive understanding of techniques applicable to their own research or advanced scholarship.
- Applied knowledge with originality, together with a practical understanding of how established techniques of research and enquiry are used to create and interpret knowledge in the discipline.
- A conceptual understanding that will enable the student to:
- evaluate, synthesise and appraise critically current research and advanced scholarship in the discipline
- evaluate methodologies and develop critiques of them and, where appropriate, to propose new hypotheses.

Transferable skills

The University's Strategy for Teaching and Learning has identified a number of generic transferable skills which all students are expected to have developed by the end of their degree programme. In following this programme, students will have had the opportunity to enhance their skills relating to career management, communication (both written and oral), information handling, numeracy, problem-solving, team working, use of information technology and hands-on skills in computer simulations.

The programme will develop the following transferable skills:

1. Critical systems theory skills
2. Systems dynamics and systems evolution analysis skills
3. Environmental management and technology skills
4. Environmental design skills
5. Reflective practitioner skills
6. Scientific, engineering and management skills
7. Inter-professional team working skills

8. Hands-on computer simulation skills

Programme content

The programme consists of 10 compulsory modules and dissertation (180 credits in total).

CEMDUS	Urban Sustainability	10	7
CEMDSDEE	Sustainable Design and Environmental Engineering	20	7
CEMREB2	Energy in Buildings	20	7
CEMDGBA	Green Building Assessment	10	7
CEMDEQ	Environmental Quality and Well-Being	10	7
CEMDUM	Urban Microclimates	10	7
CEMRC1	Carbon Management	10	7
CEMBIMAM	Building Information Modelling	10	7
CEMDICTEM	ICT and Energy Management	10	7
CEMRMR	Mini-projects and Research Methods	10	7
CEMRDP	MSc Research Project and Dissertation	60	7

Progression requirements

The University marking criteria and classification framework for taught postgraduate programmes will be applied to this programme.

The overall grade for the programme will be the aggregate of modules taken weighted by their credit value and classified as below. In general there is a requirement for marks to be $\geq 40\%$ in all taught modules, a mark of 50% for the Dissertation and an overall average of 50% across all the modules.

The programme will use the University's classification scheme which can be seen at www.reading.ac.uk/web/FILES/exams/PGclassification-post-2008.pdf. This currently shows:

- 70 - 100% Distinction standard
- 60 - 69% Merit standard
- 50 - 59% Good standard

Failing categories:

- 40 - 49% Below threshold standard (BTS)
- 0 - 39% Unsatisfactory Standard

Where there is a Below Threshold Standard (BTS), i.e. $< 50\%$, in any taught module a re-sit is permitted in August/September. Further information on resits and resubmissions can be found at : <http://www.reading.ac.uk/web/FILES/exams/PGclassification-post-2008.pdf>

To pass the MSc, students must gain a weighted average mark of 50 or more overall including a mark of 50 or more for the dissertation and a mark of at least 40 in module CEMIB9. In addition the total credit value of all modules marked below 40 must not exceed 30 credits and for all modules marked below 50 must not exceed 55 credits.

Students who gain an average mark of 70 or more overall including a mark of 60 or more for the dissertation and have no mark below 40 will be eligible for a Distinction. Those gaining an average mark of 60 or more overall including a mark of 50 or more for the dissertation and have no mark below 40 will be awarded eligible for a Merit.

Summary of Teaching and Assessment

The full details of teaching and assessment in each module is given in the module description.

Teaching

The general approach is to deliver lectures, seminar, workshops and site-visits during study at the University of Reading. The teaching is supported with guided study through traditional private study and web supported learning.

Assessment

The modules are assessed by different blends of coursework and examination. The detailed assessment regime is shown in the module descriptions.

The overall grade for the programme will be the aggregate of modules taken weighted by their credit value and classified below. In general there is a requirement for marks to be 50% in all taught modules, a mark of 50% for the dissertation and an overall average of 50% across all modules

Admission requirements

Entrants to this programme are normally required to:

- hold a good first degree, normally at least an upper second, or equivalent

- have experience and qualifications commensurate with the requirements for professional recognition by chartered institutions/institutes e.g., CIBSE, IOE.

Applicants who do not hold formal degree level qualifications, but who are able to demonstrate considerable professional experience in a relevant field, may still be accepted.

For applicants whose first language is not English, proof of competency is required. The normal requirements are:

- International English Language Test Score (IELTS): 6.5 with no less than 6 in any component
- Test of English as a Foreign Language (TOEFL) (paper-based version) 590
- Test of English as a Foreign Language (TOEFL) (internet-based) 88

Where the English language ability is below the minimum requirement, applicants may be able to attend a pre-session English programme at the International Study and Language Centre (ISLC) at the University of Reading before beginning their studies.

Admissions Tutor: Runming Yao

Support for students and their learning

University support for students and their learning falls into two categories. Learning support is provided by a wide array of services across the University, including: the University Library, the Careers, Placement and Experience Centre (CPEC), In-session English Support Programme, the Study Advice and Mathematics Support Centre teams, IT Services and the Student Access to Independent Learning (S@il) computer-based teaching and learning facilities. 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. Student guidance and welfare support is provided by Personal Tutors, School Senior Tutors, the Students' Union, the Medical Practice and advisers in the Student Services Centre. The Student Services Centre is housed in the Carrington Building and offers advice on accommodation, careers, disability, finance, and wellbeing, academic issues (eg problems with module selection) and exam related queries. Students can get key information and guidance from the team of Helpdesk Advisers, or make an appointment with a specialist adviser; Student Services also offer drop-in sessions and runs workshops and seminars on a range of topics. For more information see www.reading.ac.uk/student

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SCME support includes, in addition to the lecture programme, access to a web based system providing course material, self-assessment questions and a tutorial discussion forum. An induction programme is provided for all new students.

Career prospects

The specific aim is to develop specialist skills. These arise from the students being exposed to theory, research and methods of critical evaluation, whilst enable career development. Students who successfully complete the programme will be able to:

- operate with increased authority within their area of core expertise
- manage others in a team environment
- enhance their career opportunities

Opportunities for study abroad or for placements

At present there are no requirements, or placement opportunities, for a period abroad. Opportunities may arise in the future, for example through collaboration with China and other countries, and this will be managed by the programme team.

Programme Outcomes

Students completing this award will be able to:

- Deal with complex issues both systematically and creatively, make reasoned judgements in the absence of complete data, and communicate their conclusions clearly to specialist and non-specialist audiences.

- Demonstrate self-direction and originality in tackling and solving problems, and act autonomously in planning and implementing tasks at a professional or equivalent level.
 - Continue to advance their knowledge and understanding, and to develop new high level skills.
 - Possess the qualities and transferable skills necessary in their employment to be capable of exercising initiative and personal responsibility decision making in complex and unpredictable situations independent learning required for continuing professional development.
- Demonstrate competence in the design and management of environmental systems and their performance assessment in the context of sustainability.
- Possess an understanding of conventional and renewable energy requirements in building environmental control, to allow evaluation and synthesis to be undertaken.
 - Possess evaluation skills in the areas of low carbon building and urban design.
 - Possess abilities in the management of sustainable built environment design.
- These outcomes include those detailed outcomes described in specific modules.

Knowledge and Understanding

A. Knowledge and understanding of:

1. Strategic planning, briefing and management at design and management phases
2. Design and performance evaluation of environmental systems
3. Carbon management in urban and building scales
4. Types of energy conversion systems and their environmental impact
5. Building energy management
6. Indoor environment and assessment
7. Urban environment
8. System design methods
9. Management of engineering projects

Relevant modules: all compulsory modules

Teaching/learning methods and strategies

- Lecture presentation of theory reinforced by cases studies, visits and workshops
- Testing of knowledge base is through a combination of unseen written

Assessment

Examination and assessed assignments for core modules and for elected modules.

Skills and other attributes

B. Intellectual skills - *able to*:

1. Analyse and interpret data and design information related to environmental systems;
2. Reason critically the methodologies used in the design and evaluation of environmental systems;
3. Strategic design method
4. Solve problems using scientific, engineering and management skills.
5. Communicate with other members of a building design team

Relevant modules: all compulsory and optional modules

Teaching/learning methods and strategies

Intellectual skills are developed through the teaching programme outlined earlier. Each course involves presentation and discussion of concepts and their application to problem solving. Evaluation of the various decisions made by peers and assessors.

Assessment

The assessment methods described earlier place great emphasis on the student's ability to demonstrate these skills through written assignments and oral presentations to the set problems and tasks.

C. Practical skills - *able to*:

1. Obtain required information from the literature, internet and professionals;
2. Use advanced computer simulation tools in problem solving and design;
3. Plan, undertake and report on a piece of research or design;
4. Knowledge of the interaction between people,

Teaching/learning methods and strategies

Students receive initial training on literature search both in libraries and through the internet. Comprehensive bibliographies are provided for each course at the outset, as are guides on report and dissertation writing. Course material is available on the internet. Computer laboratory classes are scheduled for the relevant modules.

buildings and their environmental systems

Relevant modules all compulsory and optional modules;

D. Transferable skills - able to:

1. Work independently and in a group;
2. Use computer software for the design of environmental systems;
3. Enhance skills relating to career management, communication (both written and oral) and information handling;
4. Solve problem and use information technology
5. Undertake research

Relevant modules: all compulsory and optional modules; CEMSBM, CEMO30, CEMIB3.

Assessment

Skills (1-3) are assessed through coursework. Skill (4) is assessed through examination and coursework.

Teaching/learning methods and strategies

The major content of all courses, including coursework and feedback, are given to the student (1). (3) is learnt through the management of time to meet various deadlines for coursework submission. Skills (2) and (4) are developed in lectures, laboratory classes and private study. Tutorials and laboratory classes have elements of discussion and interaction between the students and lecturer and among the students themselves.

Assessment

Skills (1) and (3) are assessed through oral and written presentation of coursework. The coursework mark reflects both of the oral and written skills. Skills (2) and (4) are assessed through coursework but skill (5) is assessed by dissertation.

Please note - This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each module can be found in the module description and in the programme handbook. The University reserves the right to modify this specification in unforeseen circumstances, or where the process of academic development and feedback from students, quality assurance process or external sources, such as professional bodies, requires a change to be made. In such circumstances, a revised specification will be issued.