

## MSc in Renewable Energy and the Environment

Awarding Institution:	The University of Reading
Teaching Institution:	The University of Reading
Faculty of Science	Programme length: 12 months
For students entering in 2004	Date of specification: 3/2003
Programme Director:	Dr Anne E Wheldon
Board of Studies:	MSc/PGD in Renewable Energy and the Environment
Accreditation:	Accepted towards MPD for CEng by IMechE

### Summary of programme aims

To provide:

- understanding and experience of the technology and application of biomass, solar, wind and hydro energy systems
- experience in evaluating broader energy issues, in particular related to environmental impacts of energy use and carbon management
- experience of individual research, and presentation of research findings
- interaction with companies and other organisations involved in renewable energy in the UK.

### Transferable skills

Report writing; seminar presentation; spreadsheet modelling; use of design software; internet skills; individual research skills; teamwork skills.

### Programme content

Part 1 Compulsory modules

		Credits	Level
CEMRB	Biomass energy systems	10	M
CEMRC	Carbon management	10	M
CEMRE	Energy and the environment	10	M
CEMRH	Hydro energy systems	10	M
CEMRM	Meteorology for renewable energy	10	M
CEMRPP	Research project proposal	10	M
CEMRS	Solar energy systems	10	M
CEMRV	Visits and visiting speakers	10*	M
CEMRW	Wind energy systems	10	M

Part 1 Optional modules: candidates must take 30 further credits, which may include the modules below or other relevant modules\*\*

CEMRAB	Advanced biomass energy systems	10	M
CEMRAS	Advanced solar energy systems	10	M
Part 2 Research project			
CEMRP	Research project, dissertation and seminar	60	M

\* credits in this module are "qualifying not classifying" for assessment. Credits in all other modules are "classifying".

\*\*other relevant modules include Project management, Financial management, Sustainable construction (within the School of Construction Management and Engineering); Geographical information systems; Power Electronics (in other Departments). Note that we cannot guarantee availability of these modules.

### Part-time/Modular arrangements

The programme may be taken over 12 months full-time or 24 months part-time. Individual modules may be taken by outside participants.

### Progression requirements

In order to pass Part 1 of the MSc, a candidate must achieve:

- an overall average mark of 50% or better in the 120-credit Part 1 programme; and
- a mark of 50% or better in each of modules CEMRB, CEMRE, CEMRH, CEMRPP, CEMRS, and CEMRW; and

- ❑ a mark of 40% or better in each module. (Marks below 40% in a total of 20 credits may be condoned, provided that the candidate has pursued the relevant modules with reasonable diligence and has attempted any examinations.)

Candidates who meet all these requirements may progress directly to Part 2 of the MSc. Candidates who fail Part 1 must normally pass at the resit before progressing to Part 2. However, candidates who fail only one of the required modules may be allowed to progress to Part 2, and then resit the failed module.

### Summary of teaching and assessment

The classification system used by the University is:

Grade	Meaning	% mark
A	Distinction	70 and above
B	Merit	60-69
C	Pass	50-59
D	Below threshold standard	40-49
F	Fail	39 and below

In order to complete the MSc degree at Pass level, a candidate must achieve:

- ❑ a Pass in Part 1 (as above); and
- ❑ a mark of 50% or better in Part 2.

In order to complete the MSc degree at Merit level, a candidate must achieve, in addition to the Pass criteria:

- ❑ an overall average of 60% or better; and
- ❑ a mark of 60% or better in Part 2; and
- ❑ a mark of 40% or better in each module. (Marks below 40% cannot be condoned.)

In order to complete the MSc degree at Distinction level, a candidate must achieve, in addition to the Pass criteria:

- ❑ an overall average of 70% or better; and
- ❑ a mark of 70% or better in Part 2; and
- ❑ a mark of 40% or better in each module. (Marks below 40% cannot be condoned.)

### Admission requirements

Entrants to this programme are normally required to have obtained a degree at the equivalent of UK 2.2 honours or better in engineering or a numerate science. However, the subject area is interdisciplinary, and motivated applicants with other degree backgrounds are strongly encouraged to apply. They may be able to gain admission through successful completion of a 10- or 20-week qualifying course. We welcome applicants who have had prior experience in the field of renewable energy, also those who are interested in a career change.

Admissions Tutor: TBA

### Support for students and their learning

University support for students and their learning falls into two categories. Learning support includes IT Services, which has several hundred computers and the University Library, which across its three sites holds over a million volumes, subscribes to around 4,000 current periodicals, has a range of electronic sources of information and houses 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 Programme Directors, the Careers Advisory Service, the University's Special Needs Advisor, Study Advisors, Hall Wardens and the Students' Union.

Departmental support is provided through:

- personal tutor, course administrator and course director, all of whom are actively involved in the running of the course
- a detailed course handbook

- lectures in groups of typically 20 participants
- use of 4-5 person study groups for some coursework, which encourages peer group support.

### **Career prospects**

The programme attracts participants from a wide range of backgrounds and nationalities, and they go into a variety of careers, mainly in renewable energy, also in energy efficiency. Participants are given exposure to relevant UK companies and organisations through the "Visits and visiting speakers" module and some research projects. Employers are invited to the research project seminars.

### **Opportunities for study abroad or for placements**

Participants are encouraged to use their optional modules for study abroad or a placement, although there is no formal provision for this within the programme. Many research projects are undertaken with the involvement of outside organisations, and these may involve placement.

### **Educational aims of the programme**

To provide:

- understanding and experience of the technology and application of biomass, solar, wind and hydro energy systems;
- experience in evaluating broader energy issues, in particular related to environmental impacts of energy use and carbon management.
- experience of individual research in a relevant topic.
- interaction with companies and other organisations involved in renewable energy in the UK.

### **Programme Outcomes**

#### ***Knowledge and Understanding***

<p><b>A. Knowledge and understanding of:</b></p> <ol style="list-style-type: none"> <li>1. <i>Renewable energy resources, technology and applications</i></li> <li>2. <i>Environmental impacts of energy use, and carbon management</i></li> <li>3. <i>Selected related topics in engineering, environment, management etc</i></li> </ol>	→	<p><b><i>Teaching/learning methods and strategies</i></b></p> <ol style="list-style-type: none"> <li>1. <i>Modules CEMRB, CEMRH, CEMRS, CEMRW</i></li> <li>2. <i>Modules CEMRE, CEMRC</i></li> <li>3. <i>Optional modules</i></li> </ol> <p><b><i>Assessment</i></b></p> <ol style="list-style-type: none"> <li>1. <i>Individual assignments, group assignments, examinations</i></li> <li>2. <i>Individual assignments, group assignment, seminar</i></li> <li>3. <i>Will depend on options selected</i></li> </ol>
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#### ***Skills and other attributes***

<p><b>B. Intellectual skills – able to:</b></p> <ol style="list-style-type: none"> <li>1. <i>Present an argument using research data</i></li> <li>2. <i>Present and/or verify a quantitative argument</i></li> </ol>	→	<p><b><i>Teaching/learning methods and strategies</i></b></p> <ol style="list-style-type: none"> <li>1. <i>Seminar on report writing and use of reference information</i></li> <li>2. <i>Emphasis on quantitative reasoning in all modules</i></li> </ol> <p><b><i>Assessment</i></b></p> <ol style="list-style-type: none"> <li>1. <i>Assignments in modules CEMRC and CEMRE, research project</i></li> <li>2. <i>Assignments in modules CEMRC and CEMRE, examinations in modules CEMRB, CEMRC, CEMRH, CEMRS, CEMRW</i></li> </ol>
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<p><b>C. Practical skills – able to:</b></p> <ol style="list-style-type: none"> <li>1. Undertake laboratory experiments</li> <li>2. Use computers for research, analysis and presentation</li> <li>3. Use basic workshop equipment</li> <li>4. Undertake practical work in the field</li> </ol>	→
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<p><b>Teaching/learning methods and strategies</b></p> <ol style="list-style-type: none"> <li>1. Laboratory experiments in modules CEMRB, CEMRH, CEMRW, CEMRAB, CEMRAS</li> <li>2. Introduction to computer facilities, information on ITS courses</li> <li>3. Workshop safety course</li> <li>4. Field trip</li> </ol> <p><b>Assessment</b></p> <ol style="list-style-type: none"> <li>1. Reports on laboratory practicals</li> <li>2. Use of spreadsheets, internet, software packages in assignments</li> <li>3. Observation of workshop use</li> <li>4. Completion of fieldwork</li> </ol>
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<p><b>D. Transferable skills – able to:</b></p> <ol style="list-style-type: none"> <li>1. Write formal reports</li> <li>2. Give seminars using presentation software</li> <li>3. Design and use spreadsheets for modelling</li> <li>4. Use commercial design software</li> <li>5. Use internet as a professional information source</li> <li>6. Undertake individual research.</li> <li>7. Work in small groups</li> </ol>	→
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<p><b>Teaching/learning methods and strategies</b></p> <ol style="list-style-type: none"> <li>1. Seminars on report writing and use of reference information</li> <li>2. Seminar on oral presentation, information about ITS courses</li> <li>3. Introduction to spreadsheets</li> <li>4. Introduction to PVSystem and other design software</li> <li>5. Discussion of internet searching, validity of internet information etc</li> <li>6. Training in research project preparation in module CEMRPP</li> <li>7. Use of small groups for laboratory work and for some assignments</li> </ol> <p><b>Assessment</b></p> <ol style="list-style-type: none"> <li>1. Coursework reports, project dissertation</li> <li>2. Seminars for CEMRC, CEMRE, and research project</li> <li>3. Spreadsheet optimisation of solar water-heater</li> <li>4. PV system design using PVSystem</li> <li>5. CEMRE and other assignments</li> <li>6. Research project</li> <li>7. Group work reports</li> </ol>
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*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 expect 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 module and programme handbooks.