B3C7-RED Master of Science in Renewable Energy and Distributed Generation

PROGRAMME DETAILS
Programme Code: B3C7-RED
Department: Elect Electronic & Comp Eng
Main Award: MSC - Master of Science
Full Award Title: Master of Science in Renewable Energy and Distributed Generation
Level: Postgraduate Taught

LOCATION OF STUDY
Edinburgh  Y  Scottish Borders  N  Orkney  N
Dubai  N  Malaysia  N  Approved Learning Partner  N
Independent Distance Learners  N  Collaborative Learning Partner  N  Other  N

ASSOCIATED AWARDS
Programme Code  Award  Title
B3C0-RED  PGCERT  Postgraduate Certificate in Renewable Energy and Distributed Generation
B3C5-RED  PGDIP  Postgraduate Diploma in Renewable Energy and Distributed Generation
B3C7-RED  MSC  Master of Science in Renewable Energy and Distributed Generation

ACCREDITATION
Course is accredited by Energy Institute.

LEARNING OUTCOMES – SUBJECT MASTERY
Understanding, Knowledge and Cognitive Skills

- Develop a critical understanding of the principal theories, concepts and tools underpinning Engineering technologies and their impact.
- Provide an extensive, detailed and critical knowledge and understanding of at least one specialist area within this domain.
- Understand and be able to use a significant range of the principal skills, techniques and practices required to design or assess components or systems, or to develop new opportunities.
- A broad knowledge of the main areas of Electrical Engineering Sciences and practices.
- Develop application-based knowledge and skills relating to a range of activities.
- Develop and apply skills in critical analysis, evaluation and synthesis in consideration of the range of theories, concepts and techniques, and in the design of projects and experimental models.
- Develop abilities to critically understand and apply relevant theories and technologies to developing analytical and design skills.
- Develop and utilise advanced problem-solving skills and techniques in the development of original and creative solutions to general and specialist issues.
Scholarship, Enquiry and Research (Research Informed Learning)

- Build an overview over techniques and current debates on the basis of independent, research-informed learning.
- Develop advanced skills by transferring and applying knowledge acquired through research-informed learning.

LEARNING OUTCOMES – PERSONAL ABILITIES

Industrial, Commercial and Professional Practice

- Demonstrate critical awareness of the current issues within the discipline, and make informed judgements on the basis of available information and subject knowledge.
- Specialist and critical knowledge, understanding and skills in a number of mainstream and specialist areas within Engineering.

Autonomy, Accountability and Working With Others

- Work autonomously and within teams, as appropriate, demonstrating a capability for both taking and critically reflecting on roles and responsibilities

Communication, Numeracy & Information and Communications Technology

- Enhance skills and techniques in oral and written communication with peers and academic/industrial staff, using a range of appropriate methods to suit different levels of knowledge and expertise within the audience.
- Develop and demonstrate critical knowledge and skills in the planning and usage of industry standard tools, programming languages and numerical techniques
- Extend the ability to identify, formulate and resolve problems.

APPROACHES TO TEACHING AND LEARNING

The programme draws on a broad range of teaching and learning approaches, including

- formal lectures in which essential knowledge and skills are introduced,
- group-based learning where specialist skills are applied and practised as well as team working and communicative skills developed
- individual assignments, some focussing on the application of specialist skills, numeracy and ICT, some on communication (such as oral presentations and written reports), and some on individual responsibility and research-informed learning

EDUCATIONAL AIMS OF THE PROGRAMME
As part of the Electrical, Electronic and Computer Engineering Postgraduate Programme, the aims of this course reflect the aims of the programme as a whole (see the EECE Postgraduate Programme Proposal for more details). Specifically, this course is concerned with the concepts, applications, design, development and deployment of renewable generation and distributed electrical systems. The aims are to enable the students to:

- develop detailed knowledge and critical understanding of the core skills in renewable and distributed generation of electrical energy,
- develop and use a significant range of principal and specialist skills, techniques and practices in both renewable generation and distributed electrical energy systems,
- be able to apply this knowledge directly to complex applications,
- critically review existing practice and develop original and creative solutions to problems within the domain,
- communicate and work effectively with peers and academic staff in a variety of tasks, demonstrating appropriate levels of autonomy and responsibility, and
- plan and execute a significant project of research, investigation or development in a specialist area within renewable and distributed generation systems, demonstrating extensive, detailed and critical understanding of that specialism.
- Foster the development of personal qualities and professional competencies expected of a Chartered Engineer.
- Offer an educational environment which satisfies the academic requirements for Chartered Engineer status and membership of the IET or Energy Institute.

In addition to the subject-specific specialist knowledge and skills, the programme aims to provide a broad range of transferable skills

The students are expected to apply a mature approach to learning, tackling personal projects and organizing their study. They will learn communication skills both written and oral (they are requested to do presentations as part of their coursework and defend their MSc thesis). The mode of assessment of the masters is a mixture of continuous assessment and examination.

**ASSESSMENT POLICIES**

All courses within the programme have a balance of summative and formative assessment, where the major component of the summative assessment will usually be an end-of-course examination for the taught courses and an extensive written report such as the dissertation resulting from the research phase of the programme. The formative assessment of the programme draws from a range of methods, including specified exercises, the compilation of a portfolio, a research-informed report, or an oral presentation.
In common with the other postgraduate taught programmes in Mechanical Engineering, the programme consists of two phases:

- A taught phase, consisting of a set of 8 mandatory taught courses, which the students will normally complete over two semesters.

1. Assessment of the taught phase is through a variety of methods including coursework and/or examination.
2. Students are normally required to submit all elements of assessment before being permitted to progress to the next stage.
3. The examinations are at the end of the semester during which the course is taught.
4. In exceptional personal or medical circumstances students may be granted leave by the examiners to resit part or all of the assessment on one occasion only and at a date decided by the examiners, as stated in university regulations 4 and 5. This provision is in addition to the provision that students may retake assessment for courses in which they have achieved a grade D or less.
5. Consistent with PGCAPS, students will be able to retake the assessment of up to a maximum of 3 taught courses at the next opportunity, subject to payment of the appropriate fees to the University, and may be required to do so to obtain the necessary credits for completion of their programme or for progression. Students may only resit courses for which their examination grade is D, E or F. The method of reassessment for each course is specified in the appropriate course descriptor.

Students will normally complete the taught phase and the first stage of the dissertation phase, at which point progression to the last two stages of the dissertation phase is dependent on assessed performance. To progress, students must meet the criteria stipulated in the Programme Notes (Form P9). Students meeting the required standards for Masters in the taught phase will be permitted to progress to the second stage of the dissertation phase.

Students meeting the required standards for Postgraduate Diploma and Postgraduate Certificate (set out in Form P9) in the taught phase, but not meeting the Masters standard, will not be permitted to progress to the second stage of the dissertation phase.

Students failing to meet the required standards for Postgraduate Diploma and Postgraduate Certificate (set out in Form P9) in the taught phase will not be permitted to progress to the dissertation phase, nor will they be eligible for any award.
A dissertation phase, consisting of two stages:

1. A taught course, Critical Analysis and Research Preparation, in semester 2, during which the student identifies the project, carries out a literature review, and plans the research. The assessment of this work is in the form of a portfolio submission, which will be graded separately from the dissertation itself.

2. The second stage consists of an appropriate technical research project, during the Summer Semester where the student carries out the bulk of the research, leading to the preparation of a substantial project dissertation report, and an oral presentation towards the end of the programme.

   1. Dissertations must be submitted by the publicised submission date; dissertations submitted after that date and without the prior consent of the Programme Director may be assessed at a penalty.

   2. Dissertations will be marked by the supervisor and at least one independent internal marker as described in detail in the Programme Notes. All dissertations and marking sheets will be made available to the external examiner prior to the Exam Board.

Assessment policies affecting Award decisions

1. The specific Award requirements are detailed in the Programme Notes (Form P9)
2. In exceptional circumstances the Exam Board has the discretion to permit student progress or award, subject to appropriate justification provided by the Board.
3. Allowance for poor performance in or non-submission of a component on medical grounds is normally made only where supported by written testimony from a professional health practitioner. Such testimony must be lodged with the Programme Director prior to the Examination Board meeting.

PROGRAMME STRUCTURE

<table>
<thead>
<tr>
<th>Mandatory Courses</th>
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<tbody>
<tr>
<td>Course Code</td>
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<tr>
<td>X 1 1</td>
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<td>X 1 1</td>
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<td>X 1 2</td>
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### COMPOSITION NOTES (PG)

8 taught courses (8 mandatory + 0 optional) plus a dissertation

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>SCQF Cr</th>
<th>SCQF Lvl</th>
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<tbody>
<tr>
<td>B31GC</td>
<td>Renewable Generation and Conversion</td>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td>B51GK</td>
<td>Demand Management and Energy Storage</td>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td>B81EZ</td>
<td>Critical Analysis and Research Preparation</td>
<td>15</td>
<td>11</td>
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<tr>
<td>B31VZ</td>
<td>MSc Project</td>
<td>60</td>
<td>11</td>
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### AWARDS, CREDITS AND CRITERIA (PG)

**Awards, Credits and Levels**

<table>
<thead>
<tr>
<th>Award</th>
<th>Overall Credits</th>
<th>Specific Requirements</th>
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<tbody>
<tr>
<td>Masters Degree</td>
<td>180</td>
<td>180 SCQF credits including a minimum of 150 credit at Level 11</td>
</tr>
<tr>
<td>Postgraduate Diploma</td>
<td>120</td>
<td>120 SCQF credits including a minimum of 90 credit at Level 11</td>
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<tr>
<td>Postgraduate Certificate</td>
<td>60</td>
<td>60 SCQF credits including a minimum of 40 credit at Level 11</td>
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**Award Requirements**

<table>
<thead>
<tr>
<th>Award</th>
<th>Total Course Passes</th>
<th>Overall Mark</th>
<th>Overall Grade</th>
<th>Basis of Overall Mark/Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master (Distinction)</td>
<td>8+Dissertation</td>
<td>70</td>
<td>A</td>
<td>Credit Weighted Average greater than or equal 70% over 8 courses at grades A-C plus a Dissertation at grade A.</td>
</tr>
<tr>
<td>Master</td>
<td>8+Dissertation</td>
<td>50</td>
<td>C</td>
<td>Credit Weighted Average greater than or equal 50% over 8 courses at grades A-D plus a Dissertation at minimum grade C.</td>
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<tr>
<td>Diploma (Distinction)</td>
<td>8</td>
<td>70</td>
<td>A</td>
<td>Credit Weighted Average greater than or equal 70% over 8 courses at grades A-C</td>
</tr>
<tr>
<td>Diploma</td>
<td>8</td>
<td>40</td>
<td>D</td>
<td>Credit Weighted Average greater than or equal 40% over 8 courses at grades A-E</td>
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<tr>
<td>Certificate</td>
<td>4</td>
<td>40</td>
<td>D</td>
<td>Credit Weighted Average greater than or equal 40% over 4 courses at grades A-E</td>
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</tbody>
</table>

### DURATION OF STUDY

<table>
<thead>
<tr>
<th>IN MONTHS</th>
<th>Full-time</th>
<th>Part-time</th>
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</thead>
<tbody>
<tr>
<td>Masters</td>
<td>12</td>
<td>24</td>
</tr>
</tbody>
</table>
RE-ASSESSMENT (PG)

1. A student who has been awarded a Grade E or F in a course may be re-assessed in that course. A student who has been awarded a Grade D in a course may be re-assessed in that course in order to proceed to or be eligible to receive the award of Masters.
2. A student shall be permitted only one re-assessment opportunity in a maximum of three taught courses. The opportunity for re-assessment in four or more taught courses shall be at the discretion of the Progression Board.
3. Any further re-assessment opportunities in a course will require the approval of the Postgraduate Studies Committee.
4. A student may be permitted, at the discretion of the Progression Board, to be re-assessed in the dissertation, project or other supervised research component of the course of study.

PROGRESSION TO DISSERTATION/PROJECT

In accordance with University Regulations, to progress to Masters level a minimum of Grade C is required.