

Template C4



Programme Specification

Title of Course: *MSc Renewable Energy Engineering*

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Version number	4
Faculty	Faculty of Engineering, Computing and the Environment
School	School of Engineering
Department	Department of Mechanical Engineering
Delivery Institution	

This Programme Specification is designed for prospective students, current students, academic staff and employers. It provides a concise summary of the main features of the programme and the intended learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if they take full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes and content of each modules can be found in the course VLE site and in individual Module Descriptors.

SECTION 1: GENERAL INFORMATION

Award(s) and Title(s): <i>Up to 10 pathways</i>	MSc Renewable Energy Engineering
Intermediate Awards(s) and Title(s): <i>There are 4 Intermediate awards for each pathway</i>	
Course Code <i>For each pathway and mode of delivery</i>	PFREE1REE03 PFREE1REE03
UCAS code <i>For each pathway</i>	

RQF Level for the Final Award:	
Awarding Institution:	Kingston University
Teaching Institution:	
Location:	Kingston University
Language of Delivery:	English
Modes of Delivery:	Full-time Part-time
Available as:	Full field
Minimum period of registration:	Full-time - Part-time -
Maximum period of registration:	Full-time - Part-time -
Entry Requirements:	Applicants for this course are normally required to have a good honours degree in a relevant engineering discipline. Exceptionally applicants with substantial relevant industrial experience who do not have an honours degree may be considered. Such applicants must demonstrate strong motivation to complete the course and the ability to work at this level. International applicants are required to satisfy the Admissions Officer that they have reached an equivalent academic standard as those required for home students. Each application is assessed on an individual basis and may be subject to additional requirements, such as undertaking short course(s), work experience and/or English language qualification(s). Meeting minimum entry requirements does not automatically guarantee a place English language requirements IELTS – minimum 6.5 overall, including a minimum of 6.0 in writing, and a minimum of 5.5 in reading, listening, and

	speaking. TOEFL IBT – overall score of 88, incl. min score of 20/30 Writing, 20/30 Reading, 17/30 Listening and 20/30 Speaking. Kingston University also approved the following mapping as equivalent alternatives to IELTS requirements for entry into franchised programmes to be delivered at ESOF in Sri Lanka. I. Local GCE O Level English language: Credit, Distinction or Very good pass II. ESOF English for Academic Purposes modules in reading, writing, listening, and speaking results which equate to our normal entry conditions in the following ways (*NB: The overall grade to be an average of the four skills module results.) IELTS ESOF 6.5 58+ 6.0 50-57 5.5 42-49
Programme Accredited by:	Non-accredited programme
QAA Subject Benchmark Statements:	All subject benchmark statements can be found here : https://www.qaa.ac.uk/the-quality-code/subject-benchmark-statements . For PG provision where there is no QAA subject benchmark make reference to the QAA Master's Degree Characteristics here: https://www.qaa.ac.uk/the-quality-code .
Approved Variants:	n/a
Is this Higher or Degree Apprenticeship course?	

For Higher or Degree Apprenticeship proposals only

Higher or Degree Apprenticeship standard:	n/a
Recruitment, Selection and Admission process:	n/a
End Point Assessment Organisation(s):	n/a

SECTION 2: THE COURSE

A. Aims of the Course

The main aims of the MSc in Renewable Energy Engineering are to:

- Provide a “period of further learning” which is a requirement of the Institution of Mechanical Engineers for Chartered Engineer status for students with an accredited BEng.
- Provide students with an in-depth knowledge and critical understanding of the theoretical principles and practical approaches used in renewable energy engineering.
- Develop the skills in research, analysis, creativity, and critical thinking needed to successfully plan and execute a renewable engineering project.
- Develop the skills required to work in a multi-disciplinary team within an engineering organisation with real industrial constraints and good understanding of the environmental, economic, social, and legal implications of professional practice and professional codes of conduct.
- Equip students with the professional attitudes and wide range of transferable skills in engineering and project management which would enable them to develop and exploit their knowledge and technical expertise in the furtherance of their career and employability.
- Provide students with a strategic overview of management issues in engineering, particularly in the sustainable energy sector.

B. Intended Learning Outcomes

The course provides opportunities for students to develop and demonstrate knowledge and understanding specific to the subject, key skills, and graduate attributes in the following areas. The programme outcomes are referenced to the QAA subject benchmarks for Master’s level Engineering (2015) and the Framework for Higher Education Qualifications in England, Wales, and Northern Ireland (2008), and relate to the typical student.

The programme learning outcomes are the high-level learning outcomes that will have been achieved by all students receiving this award. They must align to the levels set out in the [‘Sector Recognised Standards in England’](#) (OFS 2022).

Programme Learning Outcomes					
	Knowledge and Understanding		Intellectual Skills		Subject Practical Skills
	On completion of the course students will be able to:		On completion of the course students will be able to		On completion of the course students will be able to
A1	Demonstrate advanced knowledge and understanding of the principles governing renewable energy engineering in the context of design and development of the renewable technologies and systems.	B1	Learn independently, and be able to critically evaluate, analyse and communicate research and data collection/analysis.	C1	Select and apply computer-based and other advanced technologies to a wide range of renewable energy engineering applications.
A2	Show knowledge and understanding in the use of computer aided technologies such as CAD, CFD, FEA, Wind-Pro, ECLIPSE, POLYSUN for modelling, simulation and prototyping renewable energy systems.	B2	Analyse problems and issues, taking due account of any incompleteness of data or information, and arrive at well-reasoned and supportable conclusions.	C2	Select and use appropriate software tools for the design and analysis of mechanical components and renewable energy management and control systems.
A3	Demonstrate a critical awareness of the current developments in the renewable energy sector.	B3	Carry out independent data collection and synthesise it to enable the problems and issues to be successfully resolved.	C3	Select modern materials and manufacturing processes for mechanical components associated with renewable energy engineering systems.
A4	Comprehend and evaluate renewable project finance including the management and techniques needed for pricing and cost control of projects in respect to time, cost and the risks inherent in engineering.	B4	Identify current issues and trends in the field of Renewable Energy Engineering.	C4	Select and apply appropriate tools and techniques for the improvement of quality in renewable energy engineering systems products and processes.
A5	Demonstrate comprehensive knowledge of the principles and detailed requirements for the	B5	Carry out a focused critical literature review.		

	management of safety and quality issues with respect to renewable engineering projects.				
A6	Display an in-depth knowledge of the nature, scope and objectives of the varying organisations and inter-firm relationships that are present in engineering, particularly relating to efficient outcomes.	B6	Develop original thought.		
A7	Demonstrate good awareness of the impact of renewable technology and related projects at social, environmental, economic, and political level.				
A8	Demonstrate an in-depth understanding of the renewable energy engineering business environment, including legal aspects, and apply modern operations and financial management techniques and good practices in a range of contexts.				

In addition to the programme learning outcomes, the programme of study defined in this programme specification will allow students to develop the following range of Graduate Attributes:

1. Creative Problem Solving
2. Digital Competency
3. Enterprise
4. Questioning Mindset
5. Adaptability
6. Empathy
7. Collaboration
8. Resilience
9. Self-Awareness

C. Outline Programme Structure

This programme is part of the University Postgraduate Regulations (PR). Programmes in the PR are made up of modules which are designated at level 7. Single modules in the framework are valued at 30 credits and the programme consists of 4 subject specific single modules (3 core & 1 optional) and the capstone project module valued as 2 single modules (60 credits). A Postgraduate Certificate (PgCert) or Postgraduate Diploma (PgDip) may be offered as an exit award, with the minimum requirement for a PgCert of 60 credits and PgDip of 120 credits. The MSc award is achieved with 180 credits completed of (all modules and the final individual project).

The programme is offered as non-accredited.

The course offers the PG Certificate, PG Diploma and MSc Renewable Energy Studies only as an exit award. All students will be provided with the University regulations and specific additions that are sometimes required for accreditation by outside bodies (e.g., professional, or statutory bodies that confer professional accreditation).

Full details of each module will be provided in module descriptors and student module guides.

Duration and academic year structure

- The maximum duration of the MSc is one year full-time and two-four years part-time.
- Students may commence in September, or January.
- The taught modules will normally run from September to May each year.
- Part-time students will normally complete their taught modules over two years and then complete their project.

To successfully complete the MSc, students must pass three core modules, one option module, and an individual project which is normally industry/research related with distinctive emphasis on industrial applications.

[MSc Renewable Energy Engineering](#)

Progression to Level 5

N/A

Progression to Level 6

N/A

Level 6 requires the completion of

N/A

Level 7							
MSc Renewable Energy Engineering							
Core modules	Module code	Credit Value	Level	Teaching Block	Pre-requisites	Full Time	Part Time
Biomass and fuel Cells Renewable Technology	AE7202	30	7	1		1	1
Engineering Individual Project	ME7761	60	7	2		1	2
Solar Power Engineering	AE7203	30	7	2		1	1
Wind Power Engineering	AE7201	30	7	2		1	1
Optional Modules							
Computational Fluid Dynamics for Engineering Applications	ME7724	30	7	1		1	2
Engineering Project and Risk Management	ME7712	30	7	1 and 2		1	2
ENGINEERING RESEARCH TECHNIQUES, ENTREPRENEURSHIP AND QUALITY MANAGEMENT	ME7711	30	7	1 and 2		1	2

Level 7 information

To successfully complete the MSc, is normally industry/research related with distinctive emphasis on industrial applications. students must pass three core modules, one option module, and an individual project which

D. Principles of Teaching, Learning and Assessment

The principles of teaching, learning and assessment are in line with the University's strategy. The fields are designed to give students a balanced portfolio of theoretical and practical experience, embracing diversity and individuality.

Industry specialists in the various renewable energy fields allied with lecturers and guest speakers from relevant industries contribute to the delivery of the programme, reinforcing the theoretical aspects and providing an informed insight into industry. The external lecturers in particular promote innovation and creativity whilst offering an insight into entrepreneurial culture, all driven by the latest research and the use of cutting-edge technology to enrich content on the taught modules in the spirit of Kingston University's; "research informed teaching" ethos. Furthermore, the practical workshops, open forums, company visits, and group presentations introduced into the modules provide students with a detailed understanding of the approaches taken in industry.

Taught materials, knowledge gained from the practical and case studies embedded within each module give students specialised knowledge, tools, and techniques. It will equip them with skills and methods for extracting and synthesising the information. These activities promote rigour, curiosity, excellence, originality, and breadth of knowledge. They must then further explore and exploit the information given, research and define outcomes accurately to produce detailed solutions and innovative work for each module and project dissertation.

It is recognised that teamwork is a very important aspect in industry, and this is implemented in the modules. The course ensures that the students are exposed to team working through group presentations, joint report writing, joint research and lab work, promoting consideration, courtesy, and collegiality.

The course teams are aware of the need for effective communication, both written and verbal, and take pride in the fact that the courses provide, in this regard, a means of preparing the students for their longer-term career plans and CPD. Apart from the project itself, each student has to give verbal presentations during the modules, normally to the student's peer group and module leader. Students are also helped with verbal communication skills through seminars, tutorials, and discussion groups. Most modules are assessed by written assignments which are designed to improve students' research and evaluation skills.

Research active teaching staff use their research expertise and findings to enhance students understanding and appreciation of major engineering issues such as noise and vibration, structural tower stability in the case of wind turbines, influence of feed stock on the environment and power out of CHP biomass plant and other related topics.

The individual project provides a challenge to the candidate to undertake a real-world problem because most projects are industry orientated. Students will be given close guidance to select a project which is relevant to the chosen field. During the project, the student will be expected to apply the knowledge learnt during the course to achieve agreed deliverables, whilst satisfying any given constraints. Key skills in communication, presentation, literature search, problem analysis, project planning, report writing, and solution justification are all part of the learning objectives defined in the field. The project work is normally aligned with the research field of the staff involved and often leads to students publishing joint papers with their project supervisor.

Students also have a range of opportunities to participate in extra-curricular activities based around clubs and learning societies as they arise, which offer further opportunities to develop their communication skills, teamwork, and ability to apply their theoretical knowledge to hands-on activities.

A combination of assessment methods will be used throughout the course. These elements include module assignments, module examinations, in-class tests, experiment reports, industrial visit reports, seminars, verbal presentations, and the project dissertation. Each module leader is responsible for ensuring that the method of assessment reflects the aims and learning objectives of the module, is demanding, and stimulating and is at the appropriate masters level.

Formative assessments are embedded into the delivery pattern of all the modules and are designed to help students learn more effectively by giving them feedback to improve their performance and feedforward towards summative assessments. Reflective practice by students and feedback from designated Personal Tutors will also form part of the formative assessments. Group activities are an important part of the course teaching and assessment strategy where students learn and improve through peer feedback.

The programme embraces the use of Technology Enhanced Learning (TEL) to engage students actively. Some of the most widely used technologies in problem-solving activities are computer simulations and modelling which encompass solar, wind power and biomass technologies in the curriculum. Digital tools such as a team's work file syncs DropBox, VLE assessment and YouTube videos are used to enhance the quality of student learning experience.

E. Support for Students and their Learning

A Personal Tutor will be assigned to each student to personalise their learning experience and support their academic and professional development from the first induction day at the university all the way to graduation and their career destination. The personal tutors will help their tutees with issues of transition from UG to Masters and understand how to use feedback on the postgraduate course. They will play an important role in supporting the large community of international students to settle down and take advantage of the university wide support system. They will also encourage students to be proactive in making links between their course and their professional and/or academic aspirations and explore their research interests as well as being part of a wider disciplinary and/or professional community in support of their career choices.

Additionally, Students are supported by a range of other course and/or university level systems, including:

- A Module Leader for each module
- A Course Director to help students understand the programme structure.
- Technical support on use of IT and workshop/lab facilities.
- A designated programme administrator.
- A dedicated employability consultant practitioner.
- An induction programme at the beginning of each new academic session.
- Series of research seminars delivered by internal and external speakers informing students about latest advances in research.
- Invited guest lecturers informing students about latest developments in technology and professional practise.
- Student Voice Committee.
- Canvas - a versatile on-line interactive Virtual Learning Environment (VLE).
- ESOF student support facilities that provide advice on issues such as finance, regulations, legal matters, accommodation, etc.
- ECET student support counselling services.

F. Ensuring and Enhancing the Quality of the Course

The University has several methods for evaluating and improving the quality and standards of its provision. These include:

- External examiners
- School Education Committee
- Annual Monitoring and Enhancement
- Periodic review undertaken at subject level
- Student evaluation including Module Evaluation Questionnaire (MEQs), level surveys
- Moderation policies
- Feedback from employers
- Industrial Advisory Board- to be established on commencement of the programme
- Professional body reaccreditation is required every four years

In addition to the University quality systems, the course currency and quality is continuously supported and evaluated by the Industrial Advisory Board. The module content and delivery methods are informed by the research and enterprise activities of academic staff.

G. Employability and work-based learning

The course is designed with close consultation with the local ECET Industrial Board at KU, hence taking on board the latest requirements of industry for graduates. Employability skills are developed throughout the delivery of the modules, particularly as part of capstone individual project. Furthermore, students are equipped with business, management, and entrepreneurial skills to enhance their employability potential globally. Delivery of many modules involves industrial speakers, who introduce students to latest industrial requirements.

Throughout the course students have access to a dedicated employment coordinator; attend specially arranged employer seminars, university career workshops and research seminars, to prepare them for the world of work once graduated.

Work-based learning, including sandwich courses and higher or degree apprenticeships

Students who successfully complete the MSc will have acquired significant research and analytical skills in the broader engineering disciplines allied to renewable energy engineering and will have substantially enhanced prospects of gaining employment or career progression in the renewable energy engineering industry. The skills acquired include computational fluid flow dynamics and simulations, economic and NPV calculations, 3D system design and modelling, operational performance and field characteristics evaluation using Polysun and Wind-Pro advanced software simulation and analysis.

Typical examples of the graduated student destination so far are as follows:

- Business Analyst, full time employee of Smartest Energy Plc.
- CFD analyst, worked on internship programme with Nuclear Institute in Netherland.
- Inspection Engineer, full time employee of Garrad Hassan Plc.
- Project Cost Controller, full time employee of Vattenfall Wind Power Ltd specializing in offshore wind farm installation.

- PV Design Engineer, full time employee of Renewable Resources Ltd, specializing in commercial PV installation.

H. Other sources of information that you may wish to consult

Engineering Council UK-SPEC
<https://www.engc.org.uk/ukspec>

Institution of Mechanical Engineers IMechE
<http://www.imeche.org/Home>

Kingston University Web site:
<https://www.kingston.ac.uk/postgraduate-course/renewable-energy-engineering-msc/>

I. Development of Course Learning Outcomes in Modules

This table maps where course learning outcomes are **summatively** assessed across the modules for this course. It provides an aid to academic staff in understanding how individual modules contribute to the course aims, a means to help students monitor their own learning, personal and professional development as the course progresses and a checklist for quality assurance purposes.

Module Code		Level 7						
		AE7202	AE7201	ME7711	AE7203	ME7761	ME7724	ME7712
Knowledge & Understanding	A1							
	A2							
	A3							
	A4							
	A5							
	A6							
	A7							
	A8							
Intellectual Skills	B1							
	B2							
	B3							
	B4							
	B5							
	B6							
Practical Skills	C1							
	C2							
	C3							

	C4							
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Students will be provided with formative assessment opportunities throughout the course to practise and develop their proficiency in the range of assessment methods utilised.