

Renewable and Sustainable Energy MSc

Programme Specification

Academic Year:	2026/27
Degree Awarding Body:	The University of Bradford
Main Location:	City Campus
Subject Benchmarks:	Engineering (Quality Assurance Agency 2023)
Qualifications Framework:	HE Qualifications of UK Degree Awarding Bodies (FHEQ: QAA 2014)
Target Degree Award:	Master of Science (MSc) Renewable and Sustainable Energy [FHEQ Level 7]
Intermediate/exit awards:	Postgraduate Diploma (PGD) or Postgraduate Certificate (PGC) [FHEQ Level 7]
Programme Admissions:	UK and international students
Programme Start Dates:	September, January
Programme Modes of Study:	12 months full-time (September start) 12 months full-time (January start)

Please note: The University has a set of terms and conditions for all students accepting an offer to study on a course here at Bradford. This is called the Student Contract. This document sets out the Terms and Conditions which apply when you accept an offer of a place on a programme of study at the University of Bradford. [View our Student Contract for further details](#). Information about this programme and its modules has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but changes may occur given the interval between publishing and commencement of teaching. Any change which impacts the terms and conditions of an applicant's offer will be communicated to them.

Minor Modification Schedule

1. July 2025: Annual changes for 2025/26 academic year including change to academic regulations.
2. April 2026: Annual changes for 2026/27 academic year, including reformat for improved accessibility.

Introduction

By 2050, renewable energy will dominate the world's energy generation. To achieve the net-zero target for greenhouse gas emissions and, in accordance with the Paris Agreement, to limit the global temperature rise to 1.5°C above pre-industrial levels, over 90% of global electricity will come from renewable energy. Particular emphasis lies upon sustainable energy production technologies such as Wind Power and Solar Photovoltaics, in conjunction with required downstream transmission and storage utilities, through the development of multiple battery systems. A "global green deal" requires collaborative measures including labour market interventions, educational and skills development with a strong focus on sustainable energy.

Over the past decade, we have witnessed a gradual shift in the workforce in the energy sector towards renewable energy and clean energy technologies. The total number of people employed in this sector reached 13.7 million in 2022 and this figure is expected to increase significantly to 42 million by 2050 (IRENA, 2023).

The MSc programme in Renewable and Sustainable Energy addresses the global workforce needs for energy transformation and shaping our energy future. It offers recent graduates from engineering-related disciplines and current engineers who are passionate about renewable and sustainable energy the opportunity to further develop and become future leaders in this fast-growing sector.

The design of this MSc programme focuses on providing technical knowledge, advanced methods and tools to address energy and sustainability challenges, and on developing professional and interpersonal skills so that graduates can solve real-world problems in the renewable and sustainable energy sector. The context of the future energy sector is embedded in the programme design and topics to be covered, e.g. sustainable energy system design, future energy mix problem, energy industrial big data, sustainability and innovation. Students will also gain experience of interlinked broader themes in innovation, design, manufacturing, operations and maintenance, economics, modelling, optimisation and energy industry big data.

This MSc programme includes a research project with an emphasis on real-world application, experiential learning and high-quality research engagement. This will make a major contribution to the student's skill set, in the skills and attributes for enhanced employability. Our students can also participate in several future-focused extracurricular activities such as employability workshops, career fairs, and focused sessions by the Career and Employability Services to support student progression to the next stage in their future careers.

The University and Faculty of Management, Sciences and Engineering

The MSc programme is delivered by an interdisciplinary programme team with contributions from external industrial partners who provide research expertise in sustainable energy-related areas, linked to the Institute of Digital and Sustainable Futures at the University with well-known research areas and centres such as Smart Industrial Systems, Sustainable Energy, Centre for Sustainable Environment, and Polymer MNT Centre. Throughout the programme, students will engage with cutting-edge research methodologies in sustainable energy technologies from design, operation and maintenance to decommission and recycling.

Lecturers at the University of Bradford are active researchers in their fields of expertise, developing new knowledge, contributing to peer-reviewed journals and books. This research permeates to their teaching practice giving students access to world leading professionals, equipment and ideas within the University's academic themes of Innovative Engineering, Advanced Healthcare and Sustainable Societies. Each year students will engage in enquiry-based projects allowing learning through practical research. The programmes of study include research with an emphasis on application, experiential learning and real-world engagement. This will make a major contribution to students' skill sets, in the skills and attributes for enhanced employability.

[The Faculty of Management, Sciences and Engineering](#) welcomes and celebrates the diverse cultural and national backgrounds of our students. We are committed to an educational experience that is inclusive of the diversity of the students and staff, and that addresses attainment gaps within our student body, particularly those between BME and white students. The University of Bradford holds Bronze [Athena Swan Charter](#) and [Race Equality Charter](#) accreditations from [AdvanceHE](#), recognising our commitment to advancing the careers of everyone in STEM.

We also recognise that the future for engineers is one where they will be working in interdisciplinary teams to solve new, complex and evolving problems that will require innovative solutions. Students' ability to work across engineering disciplines and collaboratively with experts in other specialist fields will be crucial to creating the solutions of tomorrow. We have designed our programmes to encourage and experience interdisciplinary working, to develop breadth as well as depth of skills and knowledge, and in this way, we believe students will be ideally equipped to be successful and employable.

Programme Aims

The programme is intended to:

- A1. Train the next generation of engineers to drive the global energy transformation to a sustainable future.
- A2. Provide advanced theoretical knowledge and critical and innovative thinking skills in renewable energy technologies and sustainability.
- A3. Offer technical advances, recent methods and tools to address the global sustainability challenges in relation to energy.
- A4. Equip students with interpersonal and professional skills to adapt to the changing needs of the energy industry and society.
- A5. Enable students to carry out, independently and collaboratively, projects related to sustainable energy.

Programme Learning Outcomes

On successful completion of the programme, holders of a Master of Science degree award will be able to demonstrate all of the following outcomes:

- 1. Demonstrate comprehensive knowledge at the forefront of renewable and sustainable energy.
- 2. Critically evaluate technical literature and be aware of current problems and new insights in the field of renewable energy and sustainability.
- 3. Apply fundamental mathematics, statistics, natural science and engineering principles to model and formulate complex sustainable energy-related problems.

4. Apply analytical and computational techniques to solve complex problems in renewable and sustainable energy.
5. Work effectively in a team to meet shared objectives.
6. Design and develop solutions for complex engineering problems that meet the requirements of the users and businesses in the energy sector.
7. Apply problem-solving skills and advanced data analysis techniques and use IT facilities and specialised software packages to formulate and solve energy and sustainability-related problems.
8. Deal with complex issues both systematically and creatively, make sound judgements in the absence of complete data and uncertainty and communicate their analyses and conclusions clearly to specialist and non-specialist audiences.
9. Evaluate the environmental and societal impact of solutions to complex problems (to include the entire lifecycle of a product or process) and minimise adverse impacts.
10. Plan, implement, monitor and adjust on an on-going basis, a self-directed individual research programme of work, evidencing collection and critical analysis of research data, use or adaptation of appropriate analysis tools to tackle unfamiliar problems, innovation, and application of relevant skills, reflection, and research methodologies in the production of an advanced dissertation.

Curriculum

The curriculum map shows the core and optional units for this programme, which extends over 12 months. It is made up of a taught element of 120 credits and an individual research project element of 60 credits. Please note that the curriculum may change, subject to the University's programme approval, monitoring and review procedures, as improvements are made each year. More detail, including learning outcomes, is available for each unit in the module handbooks.

The taught element is structured in the form of 20 credit modules over the 2 semesters forming the "Academic Year" of September-May. The programme has two entry points: September and January. The programme will provide flexibility with a balanced approach and optional modules in both semesters and intakes. Each student will take two core modules plus one optional module per September/January semester. Students who start in January study Spring modules first.

Table 1: Renewable and Sustainable Energy Autumn taught modules (FHEQ Level 7)

Module Code	Module Title	Credit	Study Period	Selection
ENM7005-B	Modelling and Optimisation	20	Autumn (Sem1)	Core
ENG7014-B	Advanced Sustainable Energy	20	Autumn (Sem1)	Core
COS7049-B	Statistical Applications of Industrial Big Data	20	Autumn (Sem1)	Option 1
CSE7016-B	Sustainability in the Built Environment	20	Autumn (Sem1)	Option 2

Table 2: Renewable and Sustainable Energy Spring taught modules (FHEQ Level 7)

Module Code	Module Title	Credit	Study Period	Selection
ENG7015-B	Wind and Solar Energy Systems	20	Spring (Sem2)	Core
ENG7016-B	Low-carbon Industry Energy and Materials	20	Spring (Sem2)	Core
ENB7011-B	Sustainability and Innovation for Engineers	20	Spring (Sem2)	Option 3
CPE7012-B	Polymer and Materials Engineering	20	Spring (Sem2)	Option 4

The 60 credits MSc research project is carried out throughout the year and over the summer - September to September or January to January.

Table 3: Advanced Biomedical Engineering research project (FHEQ Level 7)

Module Code	Module Title	Credit	Study Period	Selection
ENG7002-E	MSc Project	60	Full Year (123)	September Start Core
ENG7002-E	MSc Project	60	NS Year (231)	January Start Core

Learning and Teaching Strategy

The programme's teaching and learning strategy takes into consideration the learning outcomes, the nature of the subject and the student intake, and the need for students to take greater responsibility for their own learning as they progress through the programme.

Our strategy begins with the end in mind. We want students to become great engineers; that means great problem solvers and great team workers with inquisitive and curious minds. This should mean that by the end of their study with us, they can move seamlessly into the world of work, academic research, or other occupation such as an entrepreneurial/start-up venture.

The teaching and learning methods have been selected to engage students in developing their knowledge and understanding of fundamentals in the area of renewable and sustainable energy through formal learning opportunities such as lectures and tutorials, experiential learning through practical classes and lab sessions, industrial site visits and informal and social learning through team-working in projects and competitions. Studying with us will include interactive lectures, as well as smaller seminars and open discussions, and students will be encouraged to present their ideas to their cohort at multiple stages, encouraging dissemination and increasing confidence in communicating ideas, while also allowing differing points of view to be explored.

We want to develop student's understanding of the vast array of opportunities open to today's professional engineers and therefore we look to incorporate aspects of real-world engineering problems and solutions wherever possible. To this end, we also include external speakers from industry and research institutes and make use of real-world case studies, practical demonstrations, and provide lots of opportunities for students to design their own solutions. The programme is developed and delivered by a strong academic team with research focused on renewable and sustainable energy. Invited lectures and cutting-edge research are incorporated. We provide opportunities for high-quality MSc projects to be submitted to academic journals and conferences and inspire students to achieve the highest research quality.

Assessment Strategy

Our assessment strategy incorporates a wide range of different methods designed to meet the needs and expectations of industry as well as to prepare students for a potential academic research career.

In this programme, assessments aim to solve real-life energy and sustainability challenges, the tasks will be interactive and authentic, to allow the students to apply their knowledge to current problems the field faces. Assessment is a key part of the learning process and students on this programme will undertake a variety of assessments to evaluate their knowledge, practical and interpersonal skills development throughout the course. Tutors will play an active role in providing regular and constructive feedback to support and reinforce student learning.

There are two forms of assessment. Formative assessment provides an opportunity for our staff to give students feedback during their learning. This feedback is designed to help and guide learning. All the modules will have some formative assessment, and this may be in various forms including discussions or questioning from the supervisor, self-paced tutorials, online Canvas quizzes, practical activities, etc. These formative activities are crucial if students are to make the best use of their learning experience and they are designed to prepare students for their summative assessment. Summative assessment is how we grade the work on a module and the details of this assessment will be available from the beginning of the module so that students understand how the grade will be determined.

Each assessment on the programme is tailored to the specific module learning outcomes and is structured to ensure that the learning is embedded by the application of knowledge to real-world examples. Practical skills are often assessed via individual and group technical reports with the laboratory work linked with the taught modules. The methods of assessment of transferable skills are built into the structure of the examinations, case studies, laboratory demonstrations and project work.

Assessment, Continuation and Award Regulations

This programme follows the Assessment, Continuation and Award regulations published on the University's website for postgraduate courses ([Regulation 9](#)).

Award of the Masters degree requires 180 FHEQ Level 7 credits and achievement of the award learning outcomes. Students who exit the programme with 120 or 60 credits completed may be eligible for an intermediate award in line with the regulations.

Admission Requirements

We are proud to be [one of the most inclusive universities in the UK](#). All our students have potential, and we believe that as many people as possible should have the chance to benefit from higher education, no matter what their background or circumstances.

We take the time to understand the background of our applicants, understand their journey to education, and make decisions based on an applicant's potential to thrive at university and beyond.

In addition to satisfying the general admissions requirements of the University of Bradford, the typical applicant profile for this programme is to have at least a second-class Honours degree or equivalent in an engineering or science discipline (e.g. mechanical, manufacturing, industrial, chemical, electrical, electronics, computer, biomedical, environmental, civil, mathematics, physics, chemistry, etc.) from an accredited degree-awarding body. International students are welcome to apply and should [check the entry requirements page for their country on our website](#) details of equivalent qualifications.

For international students, the level of English required is listed on the [University of Bradford English language requirements website](#). Exceptionally, holders of a UK degree awarded within 2 years prior to entry to the Bradford programme may be exempt from these English test requirements. International applicants who do not meet the IELTS requirement can take a [University of Bradford pre-sessional English course](#).

Applications are welcome from students with non-traditional qualifications, and/or significant personal/professional experience. Candidates who do not fulfil the normal entry requirements but have extensive industrial experience (minimum two years) in an engineering area/position are considered on an individual basis.

If applicants have prior certificated learning or professional experience which may be equivalent to parts of this programme, the University of Bradford has procedures to evaluate and recognise this learning to provide applicants with exemptions from specified modules or parts of the programme. Find more information about [recognition of prior learning decisions](#) on the University website.

People thinking of studying with the University of Bradford don't need to wait for the start of the year to contact our Disability Service. The University can arrange for anyone to talk to this team about what support is on offer at Bradford including an invitation to our Get Set Day. To contact the Disability Service please complete the [request support form](#).

Information in this document is for the contemporary recruitment cycle and was accurate at time of publication. The current tariff and accepted qualifications for entry onto the programme is published at the online course page:

<https://www.bradford.ac.uk/courses/pg/renewable-and-sustainable-energy/>