Programme Specification

A statement of the knowledge, understanding and skills that underpin a taught programme of study leading to an award from The University of Sheffield

1	**Programme Title**	Energy Engineering with Industrial Management
2	**Programme Code**	CPET40
3	**JACS Code**	H800 (2/3), N200 (1/3)
4	**Level of Study**	Postgraduate
5a	**Final Qualification**	Master of Science (MSc)
5b	**QAA FHEQ Level**	Masters – 7
6a	**Intermediate Qualification(s)**	Postgraduate Certificate (PGCert), Postgraduate Diploma (PGDip)
6b	**QAA FHEQ Level**	Masters - 7
7	**Teaching Institution** (if not Sheffield)	Not applicable
8	**Faculty**	Engineering
9	**Department**	Chemical and Biological Engineering
10	**Other Departments involved in teaching the programme**	Mechanical Engineering
11	**Mode(s) of Attendance**	Full-time
12	**Duration of the Programme**	1 year
13	**Accrediting Professional or Statutory Body**	Not applicable
14	**Date of production/revision**	March 2019

15. Background to the programme and subject area

In a world of finite resources and witnessing a population explosion, much effort is being made to change the way in which developed societies consume energy. The MSc in Energy Engineering with Industrial Management (EEM) meets the need for the next generation of engineers and managers to be aware of the issues surrounding this very sensitive and often controversial field. The practical engineering issues surrounding energy and the often neglected underlying factors governing energy conservation and maximised efficiency are outlined throughout the programme. This course is aimed at graduates and professionals who want to take up a role with energy management responsibilities in the industry and require an advanced knowledge to the subject. All material is taught by staff who are actively involved with and working in this field.

This Masters programme provides students with a thorough understanding of energy engineering and management by combining theoretical aspects of the discipline with hands-on practical experience which ensures that our graduates are well-equipped to enter and succeed in a wide range of career areas and to meet the challenge of working within an ever-changing discipline. This course aims to create engineering professionals with strong technical and leadership skills and is intended for engineering students interested in pursuing a management career. The programme provides an increased breadth and depth of study beyond that of the BEng level, with additional emphasis on industrial relevance, team/group working, an increase in the use of industrially-relevant applications of engineering analysis, and an enhanced capability for independent learning and work.

The Department of Chemical and Biological Engineering at Sheffield is internationally well-known in energy engineering with world-class capabilities. We have a core team of inherently multidisciplinary academic staff with primary research interests and expertise in energy. This Master's programme harnesses this combined knowledge to provide a uniquely multidisciplinary learning experience relevant to the emerging discipline of energy engineering and careers in a wide range of industries including renewables, oil & gas and power generation.

16. Programme aims

The University's Mission is to provide students from a wide variety of educational and social backgrounds with high-quality education in a research-led environment using staff working at the frontiers of academic enquiry. The Department of Chemical and Biological Engineering implements this through its strong commitment to both teaching and research. It also aims to engender in its students a commitment to future self-learning and social responsibility.

The specific aims of the MSc in Energy Engineering with Industrial Management programme are to:

1. Provide access to an engineering degree to students from a range of academic and social backgrounds;
2. Provide an appreciation of business management and its application in the commercial setting;
3. Prepare students for a professional career in industry, education, public and commercial sectors;
4. Develop interpersonal skills appropriate to a professional person;
5. Encourage students to think for themselves, work effectively on their own initiative, and develop a social awareness;
6. Provide experience in conducting extended individual projects;
7. Develop the students' ability to make technical decisions;
8. Provide students with an education through a firm understanding and practical knowledge in energy engineering.

17. Programme learning outcomes

Knowledge and understanding:	
K1	Knowledge of the principles and practice of energy engineering in the industries and energy sector;
K2	Understand strategy design and development, techniques and frameworks for crafting strategic options, competitive challenges of a global market environment, implementation of strategy and change;
K3	Professional and ethical responsibilities including the regulatory framework and the global and social context of energy engineering;
K4	The impact of design on energy issues.

Skills and other attributes:	
S1	Use scientific principles: in the development of engineering solutions to practical problems; in the modelling and analysis of energy systems, processes and products;
S2	Hands-on experience of the creation of a business plan;
S3	Assimilate data from a wide range of sources, extract that which is pertinent to an unfamiliar problem, and apply this to a particular problem;
S4	Produce solutions to problems through the application of energy engineering knowledge and understanding.

18. Teaching, learning and assessment

Development of the learning outcomes is promoted through the following teaching and learning methods:

Lecturing – formal teaching to larger audiences for dissemination of broader concepts and outcomes.

Group learning – smaller groups where group participation and question and answer sessions are preferred.

Individual tuition – one on one learning especially required for personal tuition and for the dissertation.

Site visits – experience actual power plants and talk to staff involved in this industry sector.

Independent learning – learn how to complement formal teaching using finding, assessing and using data and knowledge to build skills that will assist the student long after the completion of this course.

Opportunities to demonstrate achievement of the learning outcomes are provided through the following assessment methods:

Written examinations – unseen examinations.

Coursework submission – designed to test knowledge and communication skills; these include technical design studies, computational assessments and extended analytical essays.

Class tests – tests conducted in a lecture theatre during the main teaching periods to assess progress.

Oral presentations – The research projects and some taught modules include an oral presentation.

Individual project reports – these include intermediate and final individual enquiry.

19. Reference points

The learning outcomes have been developed to reflect the following points of reference:

Subject Benchmark Statements
http://www.qaa.ac.uk/assuring-standards-and-quality/the-quality-code/subject-benchmark-statements

Framework for Higher Education Qualifications
http://www.qaa.ac.uk/publications

University Strategic Plan
https://www.sheffield.ac.uk/ourplan/

Learning and Teaching Strategy (2016-2021)
https://www.sheffield.ac.uk/staff/learning-teaching/our-approach/strategy2016-21

'Academic Standards – Engineering', Subject Benchmark Statement, Quality Assurance Agency for Higher Education, 2015 (as far as this pertains to postgraduate masters' programmes).

Informed feedback from external industrial referees on research project design and assessment.

In assessing students' achievement of the learning outcomes, the level of performance, e.g. the extent of knowledge and depth of understanding, will be compliant with guidance given in the above references.

20. Programme structure and regulations

In common with most degrees at the University of Sheffield, the programme of study is modular in nature allowing students a certain level of flexibility in the design of their degrees. Postgraduate taught modules offered are usually 15 credits, which is nominally equivalent to 150 hours of work by a student. Of this between 30 and 40 hours are usually contact time and the remainder directed/private study. Credits are accumulated by obtaining a mark of at least 50 in the assessment for the module.

Students studying for the award of Masters are required to take modules to the value of 180 credits, comprising two compulsory 15-credit modules in energy engineering, three management modules to the value of 45 credits, a choice of three optional modules of 15 credits each in energy engineering, and a 60-credit supervised dissertation. The credits will be divided evenly between both semesters.

Detailed information about the structure of programmes, regulations concerning assessment and progression and descriptions of individual modules are published in the University Calendar available on-line at http://www.sheffield.ac.uk/calendar.

21. Student development over the course of study

The student will gain a practical understanding of energy engineering and its application to the industries.

The student will also gain an understanding of elements of business management including Human Resource Management (HRM), strategic management with the option of also gaining financial management and supply chain management skills.

They will carry out an individual research project and demonstrate an ability to carry out independent research and critically evaluate the results. They will display levels of creativity, originality and judgement expected of Masters' degree graduates and, upon successful completion of the programme, will have developed and demonstrated achievement of the overall programme outcomes outlined in Section 17 and met the aims given in section 16.

22. Criteria for admission to the programme

Detailed information regarding admission to programmes is available from the University's On-Line Prospectus at http://www.sheffield.ac.uk/study/.

At least a 2.2 degree or equivalent is acceptable to the University, in a suitable subject. International students are also required to offer a suitable language qualification, such as IELTS (minimum overall score 6.5 with no individual score less than 5.5). Successful candidates may be required to attend an English Language course in the University before or during the programme.

The Department expects "Matching Section" accreditation only to apply to those students who have a first degree or equivalent acceptable to Energy Institute and IChemE who should be consulted as to eligibility.

23. Additional information

Please see programme regulations for breakdown of modules.

This specification represents a concise statement about the main features of the programme and should be considered alongside other sources of information provided by the teaching department(s) and the University. In addition to programme specific information, further information about studying at The University of Sheffield can be accessed via our Student Services web site at http://www.shef.ac.uk/ssid.