

PROGRAMME SPECIFICATION



1	Awarding Institution	Newcastle University
2	Teaching Institution	Newcastle University
3	Final Award	Master of Research
4	Programme Title	MRes Urban Energy Technology and Policy
5	Programme Code	4856F
6	Programme Accreditation	Not Applicable
7	QAA Subject Benchmark(s)	Not Applicable
8	FHEQ Level	7
9	Last updated	July 2021

10 Programme Aims

The aim of the programme is to provide a wide, cross-scale and integral understanding of energy in cities. The programme has a focus on UK policy environment whilst being well-situated within international energy challenges. The course is designed for highflying graduates from engineering, planning, architecture, science and relevant business management backgrounds intending to play a high-profile role in planning, designing, managing and policy making for the next generation of Urban Energy infrastructure. The course builds on the latest scholarship and professional practice and a large part of it will be appropriate to prospective employers in the private sector such as energy consultancies, engineering and architectural firms, energy companies and in the public sector such as local authorities.

It is intended that the course will provide a firm basis for the professional development of graduates intending to follow a career in industry by following one of two routes.

- The first is to complete the course, qualify with an MRes, and move from there into industry.
- The second route is to follow the MRes by a further period of research, in an area defined by experience and contacts established during the course and leading to a doctorate.

It is envisaged that they would then move into industry to implement, for instance, state of the art modelling techniques, tailored to industrial requirements, developed over the previous four years. Whilst the emphasis of the course is on the former route, experience of the Department in collaboration with industry has shown the second route to be a very effective vehicle for technology transfer for carefully targeted projects.

Degree Programme Objectives

The course aims to provide its students with the basic skills and knowledge of the tools required to carry out a research project in an industrial context. In order to achieve this objective, it is necessary for them to understand the environment in which they will operate, and to appreciate the techniques that will enable them to do so effectively. They will learn:

- the basic tools for managing any project;
- to study the specialised techniques for undertaking projects with a strong research bias;
- to analyse and define the objectives of a project;
- to design and to plan it according to rational methodologies;
- to carry it out in accordance with practicable and efficient procedures;
- to analyse and interpret the results and to present them in a meaningful manner.

During the course they will participate in project work that, in addition to achieving certain technical and educational objectives, will be designed to develop interpersonal and transferable skills.

The programme is designed to satisfy the requirements of the Framework for Higher Education Qualifications for a level 7 award and to comply with University policies and the QAA Quality Code for Higher Education.

11 Learning Outcomes

The programme comprises four main elements; Research Techniques, Advanced Knowledge, Advanced Skills, and Transferable and Personal Skills. It is designed to provide opportunities for students to develop and demonstrate knowledge and understanding, skills, qualities and other attributes in the following areas. The codes in parentheses following the programme outcomes refer to the QAA benchmark statements for Engineering. The typical (modal) student will have. Learning outcomes are supported by the latest scholarship and professional practice.

Knowledge and Understanding

On completing the programme students should have:

- A1 Detailed knowledge and understanding of facts, concepts, principles and theories relevant to the student's chosen area of specialisation within Urban Energy;
- A2 Detailed knowledge and understanding of qualitative, quantitative or creative practice methods and processes in the student's chosen area of specialisation within Urban Energy;
- A3 Knowledge of IT applications to the selected fields of study;
- A4 A good understanding of the conceptual and detailed design of artefacts appropriate to their area of specialisation;
- A5 Where appropriate, an understanding of management principles and business practices, including professional and ethical responsibilities;
- A6 An understanding of the role of energy specialists in society and the constraints within which their judgement will be exercised;
- A7 An understanding of production practice, regulatory and legislative framework;

Teaching and Learning Methods

Acquisition of A.1 and A.2 is through a combination of lectures, tutorials, example classes, and coursework.

Outcome A.3 is initially achieved by lectures, tutorials and, where appropriate, hands-on computer exercises. A.3 can also be pursued via students individual course work, research and creative projects.

Acquisition of A.4 and A.5 is through lectures, tutorials, case studies, creative project and student investigations and presentations.

The broader professional outcomes, A.6 and A.7, are taught by lectures and coursework studies.

Assessment Strategy

For some engineering based modules (SPG), the primary means of assessing factual knowledge is the closed book examination. For the rest of modules, coursework is the primary means of assessing achievement of intended learning outcomes. Both type of modules formative assessment occurs through tutorial examples, coursework and

presentations. In depth individual learning frequently forms part of the project, which is assessed by dissertation and viva voce examination.

Intellectual Skills

On completing the programme students should be able to:

- B1 Select and apply appropriate quantitative (e.g. mathematical methods for modelling), qualitative or creative project practice for analysing relevant problems;
- B2 Use scientific principles in the development of urban energy solutions to practical problems;
- B3 Use scientific principles in the modelling and analysis of urban energy systems, processes and products
- B4 Select and apply appropriate quantitative (e.g. computer based methods for modelling), qualitative or creative project practice for analysing problems in selected fields;
- B5 Be creative in the solution of problems and in the development of designs;
- B6 Integrate and evaluate information and data from a variety of sources;
- B7 Take an holistic approach to solving problems and designing systems, applying professional judgements to balance risks, costs, benefits, safety, reliability, aesthetics and environmental impact.

Teaching and Learning Methods

The skills associated with B1-B3 are acquired principally through experience gained in coursework and the project. IT skills (B4) are developed initially through lectures and through hands-on exercises and assignments. Further individual learning may also form a significant part of the project. Skill in designing products or processes is acquired through lectures, and developed through case studies and/or the project. Case studies provide initial opportunities for developing the skills associated with B5, B6 and B7, but the project forms the principal vehicle for their acquisition. The skills required for B7 are acquired initially through lectures and developed by case studies. Some projects may require further individual learning in this area. Effective project management is learnt through course works and the project.

Assessment Strategy

Formal examinations are most commonly used to assess intellectual abilities. Assessed coursework provides further opportunities to demonstrate intellect and ability. The project, which is assessed by dissertation and viva voce examination, provides final evidence of the levels attained.

Practical Skills

On completing the programme students should be able to:

- C1 Use appropriate methods for modelling and analysing problems in urban energy;
- C2 Select appropriate research set-up and procedures;
- C3 Carry out fieldwork, case study, experiments, or creative practice in a professional manner.
- C4 Write computer software and use it, or commercial packages, for appropriate tasks;
- C5 Design a system, component or process in selected fields;
- C6 Test design ideas practically through design work, social science methods or software

simulation with adequate analysis so as to evaluate the results critically;

C7 Search for information for the further development of ideas;

C8 Apply qualitative, quantitative or creative practice techniques taking account of industrial and commercial constraints;

C9 Manage projects effectively.

Teaching and Learning Methods

Where appropriate, C1 is reinforced in lectures, but learning is principally in tutorials and assignments. The abilities characterised by C2 – C4 are initially encountered in lectures, practical classes and case studies, but are developed principally during the research project. Acquisition of C5 occurs through lectures and case studies and may form a major part of the project. Experimental, research and design skills are further developed through coursework activities, fieldwork, and research and design projects. Individual feedback is given to students on all work produced. Creative and design skills are developed through design and project work. These activities develop the abilities listed in C6-C9.

Assessment Strategy

Practical skills are assessed through, field studies, creative project write-ups, coursework reports, project reports and presentations.

Transferable/Key Skills

On completing the programme students should be able to:

D1 Manipulate and present data in a variety of ways;

D2 Use scientific, social science or creative evidence based methods in the solution of problems;

D3 Use general IT skills;

D4 Show creativity and innovation in problem solving;

D5 Work with limited or contradictory information;

D6 practise effective communication;

D7 Employ qualitative/quantitative/creative design approach to the solution of problems;

D8 Demonstrate time and resource management.

Teaching and Learning Methods

D2-D8 transferable skills are present in the taught modules. D1 is mainly present in engineering based modules, urban energy and research related methods which use data. The MRes research project also provides an opportunity for students to advance their knowledge in selected transferable skills (i.e. the majority of them).

Assessment Strategy

D2, D3, and D4-D8 are assessed in taught based modules. D1 and D3 are assessed in the majority of engineering modules and those research methods modules related to quantitative methods.

12 Programme Curriculum, Structure and Features
Basic structure of the programme
The one-year course is a modular one integrated with the university semester system but continuing for a period of a further three months beyond the end of the second semester. The course has a component involving formally taught modules and a component in which students exercise and develop the skills they have acquired in carrying out a research project. The course comprises of two compulsory modules (140 credits) and a choice of 40 credits from eight additional modules. The research project will start in the second semester. The Research Project, which receives a weighting of 120 credits, lasts throughout the calendar year, beginning in earnest at the beginning of the second semester. It is carried out in collaboration with the academic supervisor and, preferably, an industrial partner. Both academic supervisor and potential industrial partner participate in the definition of the project specification and the supervision of the project. The structure of the course differs from conventional MEng and MPhil courses, or the first year of a PhD course, in that the taught part explicitly comprises four components that might be described under the headings Research Techniques, Advanced Knowledge, Advanced Skills, and Transferable and Personal Skills. This structure follows the original EPSRC guidelines on developing MRes courses. The module options offered are designed to take into account student aspirations (whether they wish to continue to study for a PhD, or enter directly into industry) and the subject area of their research project.
Key features of the programme (including what makes the programme distinctive)
This is a distinctive programme which is generic in nature and aims to develop the skills and knowledge of graduates from a wide range of engineering, science, built environment professionals, and relevant business management backgrounds. It enables students to carry out research-related project work in the multidisciplinary Urban Energy field. The programme offers high-quality training in research methods and practice; practical and subject specific skills; and transferable and personal skills. It is also a highly desirable qualification for further studies at PhD level or a career in research and development or industry.
Programme regulations (link to on-line version)
4856 Programme Regulations 21-22

13 Support for Student Learning
Generic information regarding University provision is available at the following link. https://www.ncl.ac.uk/ltids/assets/documents/qsh_progspec_generic_info.pdf

15 Methods for evaluating and improving the quality and standards of teaching and learning
Generic information regarding University provision is available at the following link. https://www.ncl.ac.uk/ltids/assets/documents/qsh_progspec_generic_info.pdf

16 Regulation of assessment

Generic information regarding University provision is available at the following link.

https://www.ncl.ac.uk/ltds/assets/documents/qsh_progspec_generic_info.pdf

In addition, information relating to the programme is provided in:

The University Prospectus: <http://www.ncl.ac.uk/postgraduate/>

Degree Programme and University Regulations: <http://www.ncl.ac.uk/regulations/docs/>

Please note. This specification provides a concise summary of the main features of the programme and of the learning outcomes that a typical student might reasonably be expected to achieve if she/he takes full advantage of the learning opportunities provided. The accuracy of the information contained is reviewed by the University and may be checked by the Quality Assurance Agency for Higher Education.