Programme Specification[1]

1. Programme Title(s) and Code(s):

Programme Title	*UCAS Code*	*GU Code*
MEng Civil Engineering	H200	H200-2204

2. Academic Session:

2018-19

3. SCQF Level (see Scottish Credit and Qualifications Framework Levels):

11

4. Credits:

600

5. Entrance Requirements:

Please refer to the current undergraduate prospectus at: http://www.gla.ac.uk/undergraduate/prospectus/

6. ATAS Certificate Requirement (see Academic Technology Approval Scheme):

ATAS Certificate not required

7. Attendance Type:

Full Time

8. Programme Aims:

MEng in Civil Engineering

Civil Engineering involves the design and construction of the physical infrastructure that all of us depend upon throughout our daily lives. This includes major buildings, transportation infrastructure (roads, railways, bridges, tunnels, airports and harbours), energy generation infrastructure (conventional power stations, renewable energy sources, oil and gas platforms), water resource infrastructure (dams and reservoirs, distribution networks, treatment plants, irrigation projects), waste treatment facilities and flood protection measures. The

[1] This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if full advantage is taken of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each course can be found in course handbooks and other programme documentation and online at www.gla.ac.uk/

The accuracy of the information in this document is reviewed periodically by the University and may be checked by the Quality Assurance Agency for Higher Education.

MEng degree in Civil Engineering at the University of Glasgow provides a thorough grounding in the fundamentals underpinning civil engineering (including mathematics, statics, dynamics, materials, structural mechanics, fluid mechanics, hydrology, environmental processes and soil mechanics), followed by the broad range of disciplines which together make up Civil Engineering (including structures, geotechnics, water and environmental engineering, transportation engineering, construction management and surveying). A key feature of the degree is strong emphasis on design, with major design projects in every year and a substantial and continuous thread of design-based learning. These encourage students to take a holistic approach to their learning and help them to apply the principles and methods of analysis and design to develop integrated solutions to practical civil engineering problems.

The MEng programme is an integrated Masters programme in Civil Engineering, designed as a preparation for professional practice. It provides an extended and enhanced programme of study beyond the BEng and is not simply a one year extension to the BEng. It is designed for the more able student. The programme of study is both broader and deeper than the corresponding BEng (Hons).

This degree programme aims to:

- present an integrated in depth multidisciplinary programme of study which will provide the student with knowledge and understanding of Civil Engineering;
- provide opportunities for the student to study in depth a choice of specialist topics within the field of Civil Engineering, including advanced level options in the final year;
- provide an opportunity for students to develop transferable problem solving skills in Civil Engineering in group and large scale individual project work;
- provide a strong education and practice in civil engineering design, through highly realistic design project activities, including major design projects in later years;
- develop the student's mathematical rigour, accuracy and numerate skills appropriate for professional engineering;
- present and develop professional, ethical, economic and management issues relevant to the Civil Engineering industry, including Health & Safety, risk assessment, environmental impact assessment and sustainability issues.

9. Intended Learning Outcomes of Programme:

The programme provides opportunities for students to develop and demonstrate knowledge, understanding, skills, qualities and other attributes in the following areas.

Knowledge and Understanding:

Graduates will be able to:

- Use their knowledge and understanding of the appropriate mathematical, scientific and computational tools that underpin Civil Engineering to solve, in depth, analytical, design or theoretical problems in the field of Civil Engineering;
- Apply their knowledge and understanding of physical laws, mathematics, numerical analysis and other relevant information in order to model Civil Engineering and similar systems;
- Draw on materials from a range of courses and wider reading in Civil Engineering principles and in related disciplines in order to solve problems in Civil Engineering including demonstrating depth and breadth to their learning;
- Apply business and management techniques that are relevant to Civil Engineering and Civil Engineers;
- Explain the role of Civil Engineers in society and the constraints within which their engineering judgement will be exercised;
- Explain the professional and ethical responsibilities of Civil Engineers;
- Consider the national and international role of the Civil Engineer and the impact of engineering solutions in a global context.

Skills and Other Attributes:

Graduates will be able to:

Subject-specific/practical skills

- Plan and execute safely a series of experiments in Civil Engineering;
- Design, from requirement or specification, a Civil Engineering project, including both conceptual and detailed design, and present this design via a series of poster, written and oral presentations from both group and individual work;
- Use laboratory and workshop equipment to generate data from Civil Engineering systems with

appropriate rigour;
- Analyse experimental results in depth and determine their strength and validity;
- Assess the safety of a design or construction process;
- Prepare technical drawings and technical reports;
- Give in depth technical presentations in oral form, as posters or in written form;
- Write up experimental methods, results and conclusions, and carefully and clearly plot experimental or computational results and interpret experimental data by the use of regression, curve fitting and filtering, applying appropriate statistical analysis;
- Use scientific literature effectively and by drawing on their knowledge from lectures and wider reading around the subject be able to solve Civil Engineering problems;
- Develop and update a research plan and adjust a work programme in order to conduct a major research project;
- Undertake a large scale supervised research project and present the results of this work in a written report and oral presentation to peers and staff;
- Work effectively in both individual and group design projects;
- Explain in depth the managerial and economic factors facing a professional engineer;
- Document their solutions to Civil Engineering problems so that others can follow and validate their work;
- Apply professional engineering practice and judgement in project work;
- Write computer programs and use computational tools and packages, selecting the appropriate "state of the art" tools to solve Civil Engineering problems.

Intellectual skills

Graduates will be able to:

- Apply appropriate quantitative mathematical, scientific and engineering tools to the analysis of problems;
- Apply rigour in mathematics;
- Plan, conduct and report a programme of original research;
- Analyse and solve engineering problems;
- Design a Civil Engineering project or system to meet a need;
- Be creative in the solution of problems and in the development of designs;
- Integrate knowledge and understanding of other scientific, mathematical, computational or engineering disciplines in order to support their engineering specialisation;
- Formulate and test hypotheses modifying the hypotheses depending on the data obtained;
- Evaluate designs, processes and products and make improvements;
- Integrate and evaluate information and data from a variety of sources;
- Take a holistic approach in solving problems and designing systems, applying professional judgements to balance risks, costs, benefits, safety, reliability, aesthetics and environmental impact.

Transferable/key skills

The skill set of the Civil Engineer graduating from the MEng programme will be of use in a wide range of applications because of the multi-disciplinary nature of the subject. Their skills will be, by definition, transferable.

Graduates will be able to:

- Apply in depth problem solving and analytical thinking to a diverse range of problems;
- Use appropriate multi-disciplinary skills to solve Civil Engineering problems, combining the breadth of knowledge gained through the degree;
- Demonstrate numeracy and literacy in written reports, project work and examinations;
- Work in a group project environment and contribute effectively to the group project, including working as a member of an interdisciplinary team;
- Work on an individual project involving self-directed research;
- Communicate effectively (in writing, verbally and through drawings);
- Apply mathematical skills (algebra, geometry, modelling, analysis);
- Transfer techniques and solutions from one field of engineering to another and to the Civil field from appropriate other disciplines;
- Use information and communications technology;
- Manage resources and time effectively;
- Exercise team leadership;
- Learn independently in familiar and unfamiliar surroundings with open-mindedness and in the spirit of

critical enquiry;
- Learn effectively for the purpose of continuing professional development and in a wider context throughout their career.

10. Typical Learning and Teaching Approaches:

Staff involved in the degree programme utilise a wide range of teaching methods that they deem the most appropriate for a particular course. These include:

- Lectures;
- External lectures from industry;
- Feedback given to students during tutorials;
- Small group and large group tutorial sessions (including group design projects);
- Question and answer sessions during lectures or staff Office Hours;
- Guided reading of texts, journal articles etc., for individual and group projects;
- Completion of web-based exercises or computer based laboratory sessions;
- Laboratory sessions.

11. Typical Assessment Methods:

Assessment Methods to be used are:

- Written examinations (Summative assessment);
- Oral presentations of individual and group work;
- Individual written project report(s) of both individual and group projects;
- Group written project report(s) of group projects;
- Interview of group project manager and assessment of group project minutes;
- Poster presentation of group project work;
- Practical skills will be assessed through laboratory experiments, write-ups, coursework reports, project reports and presentations;
- Experimental, research and design skills will be assessed through laboratory experiments write-ups, coursework reports, project reports and presentations;
- Presentation skills through group presentations and poster presentations.

12. Programme Structure and Features:

MEng H200-2204

MEng Year 1

Compulsory Courses

Course Code	Course	Credits	Semester
ENG1003	Analogue Electronics 1	10	1
ENG1026	Engineering Skills 1	10	1 & 2
ENG1027	Environmental Engineering 1	10	2
ENG1033	Materials 1	10	1
ENG1061	Civil Engineering 1	10	1 & 2
ENG1062	Dynamics 1	10	2
ENG1063	Engineering Mathematics 1	40	1 & 2
ENG1065	Statics 1	10	1
ENG1066	Thermodynamics 1	10	2
		120	

MEng Year 2

Compulsory Courses

Course Code	Course	Credits	Semester
ENG2047	Soil Mechanics 2	10	2
ENG2048	Structural Design 2	20	1
ENG2071	Structural Design Project 2	10	2

ENG2078	Environmental Processes 2	10	2
ENG2079	Civil Engineering Skills 2	10	2
ENG2080	Geology & Surveying for Civil Engineers 2	10	2
ENG2081	Mechanics of Structures 2A	10	1
ENG2082	Mechanics of Structures 2B	10	2
ENG2085	Fluid Mechanics 2	10	1
ENG2086	Engineering Mathematics 2	20	1
		120	

MEng Year 3

Compulsory Courses

Course Code	Course	Credits	Semester
ENG3046	Structural Design 3	10	1
ENG3047	Structural Mechanics 3	20	1 & 2
ENG3073	Geotechnical Engineering 3	20	1 & 2
ENG3037	Mechanics of Solids 3	10	1
ENG3075	Structural Design Project 3	10	2
ENG3076	Civil Design Projects 3	10	2
ENG3080	Environmental Process Engineering 3	10	2
ENG3082	Construction Management 3	10	2
ENG3085	Engineering Hydraulics 3	10	1
ENG3086	Highway Engineering 3	10	1
		120	

MEng Year 4

Compulsory Courses

Course Code	Course	Credits	Semester
ENG4025	Finite Element Analysis 4	10	1
ENG4070	Geotechnical Engineering 4	10	1
ENG4085	Integrated System Design Project 4	20	1 & 2
ENG4122	Structural Analysis 4	10	2
ENG4124	Advanced Steel & Concrete Design 4	10	1
ENG4188	Geotechnical Design Project 4	20	2
ENG4192	Hydraulics & Hydrology 4	10	2
		90	

Optional Courses (choose 30 credits)

Course Code	Course	Credits	Semester
ENG4072	Ground Engineering 4	10	2
ENG4079	Industrial Aerodynamics 4	10	2
ENG4152	Environmental Biotechnology 4	10	2
ENG4173	Renewable & Sustainable Energy 4	10	1
ENG4183	Transportation Systems Engineering 4	10	1
GEOG4057	Managing River Catchments	10	2 (Alt Years)
GEOG4060	Coastal Environments and Management	10	1 (Alt Years)
GEOG4061	Coastal Processes	10	1 (Alt Years)

MEng Year 5

Compulsory Courses

Course Code	Course	Credits	Semester
ENG5273	Structural Design Project 5	20	2
ENG5295P	Individual Project C5	40	1
		60	

Optional Courses (choose 60 credits)

Course Code	Course	Credits	Semester
ENG5048	Introduction to Wind Engineering	10	2
ENG5224	Advanced Concrete Performance	10	2
ENG5227	Computational Modelling of Nonlinear Problems 5	10	2
ENG5274	Advanced Structural Analysis and Dynamics 5	10	2
ENG5275	Reclamation of Contaminated Land	10	2
ENG5293	Water & Environmental Design 5	10	2
ENG5284	Advanced Soil Mechanics 5	10	1
ENG5304	Transport Network Optimisation 5	10	2
GEOG4057	Managing River Catchments	10	2
GEOG5019	Principles of GIS	10	1

Regulations

This programme will be governed by the relevant regulations published in the University Calendar. These regulations include the requirements in relation to:

(a) Award of the degree
(b) Progress
(c) Early exit awards

http://www.gla.ac.uk/services/senateoffice/calendar/

13. Programme Accredited By:

Accredited by the Joint Board of Moderators (JBM), representing the Institution of Civil Engineers (ICE), the Institution of Structural Engineers (IStructE), the Chartered Institution of Highways and Transportation (CIHT) and the Institute of Highway Engineers (IHE), as fully satisfying the academic base for a Chartered Engineer.

14. Location(s):

Glasgow

15. College:

College of Science and Engineering

16. Lead School/Institute:

Engineering [REG30300000]

17. Is this programme collaborative with another institution:

No

18. Awarding Institution(s):

University of Glasgow

19. Teaching Institution(s):

University of Glasgow

20. Language of Instruction:

English

21. Language of Assessment:

English

22. Relevant QAA Subject Benchmark Statements (see Quality Assurance Agency for Higher Education) and Other External or Internal Reference Points:

This Programme Specification is informed by the QAA Benchmark Statement for Engineering http://www.qaa.ac.uk/en/Publications/Documents/Subject-benchmark-statement-Engineering-.pdf It is also informed by the Engineering Council Publication "UK Standard for Professional Engineering Competence (UK-SPEC)" http://www.engc.org.uk/engcdocuments/internet/Website/UK-SPEC third edition (1).pdf and the requirements of the Joint Board of Moderators (http://www.jbm.org.uk/)

23. Additional Relevant Information (if applicable):

Support for students is provided by the Postgraduate/Undergraduate Adviser(s) of Studies supported by University resources such LEADS (www.gla.ac.uk/myglasgow/leads/), Counselling & Psychological Services (www.gla.ac.uk/services/counselling/), the Disability Service (www.gla.ac.uk/services/studentdisability/) and the Careers Service (www.gla.ac.uk/services/careers/).

24. Online Learning:

No

25. Date of approval:	25/09/2018