

Programme Specification for Postgraduate Programme Leading to: MSc Structural Integrity



Applicable for all postgraduate students starting in September 2017

Version No.	Date	Notes - Q&S USE ONLY	QSO Initials
2016.17 v1	11 August 2016	Programme specification updated for postgraduate entrants in 2016.	SMck
2016.17 v2	5 January 2017	Programme accredited by the Institution of Mechanical Engineers (IMechE) and the Institute of Materials, Minerals and Mining (IOM3). Accreditation back dated to the 2014.15 intake.	JP
2017.18 v1	27 June 2017	Rename of ME5603 Codes of practice with Principles and Application to ME5628 Codes and Standards in Structural Integrity	JP

Postgraduate Taught Programme	
1. Awarding institution	Brunel University London
2. Teaching institution(s)	Brunel University London
3. Home college/department/division	College of Engineering, Design and Physical Sciences/ Dept of Mechanical, and Aerospace Engineering
4. Contributing college/department/division /associated institution	National Structural Integrity Research Centre (NSIRC) and TWI (The Welding Institute)
5. Programme accredited by	The programme has been accredited by the Institution of Mechanical Engineers (IMechE) and by the Institute of Materials, Minerals and Mining (IOM3).
6. Final award(s) and FHEQ Level of Award	MSc Structural Integrity FHEQ Level 7
7. Programme title	MSc Structural Integrity
8. Programme type (Single honours/joint)	N/A
9. Normal length of programme (in months) for each mode of study	Full time 12 months
10. Maximum period of registration for each mode of study	The normal length of programme plus two years up to a maximum of five years
11. Variation(s) to September start	None
12. Modes of study	Full time
13. Modes of delivery	Off Campus; Block teaching
14. Intermediate awards, titles and FHEQ level of award	PGDip in Structural Integrity - FHEQ Level 7 PGCert in Structural Integrity - FHEQ Level 7
15. UCAS Code	N/A
16. JACS Code	H100, H300
17. Route Code	H100PSTRUCIN
18. Relevant subject benchmark statements and other external and internal reference points used to inform programme design	QAA UK Quality Code for Higher Education which includes the English Framework for Higher Education Qualifications within Part A on Setting and Maintaining Academic Standards QAA Subject Benchmark Statement (Engineering) Brunel 2030 Brunel Placement Learning Policy, as published under the 'Placements' section of the Managing Higher Education Provision with Others page.
19. Admission Requirements	Details of entry requirements are provided on the University's and College website. Levels of English for non-native speakers are outlined on Brunel International's language requirements pages
20. Other relevant information (e.g. study abroad, additional information on placements)	The programme will be delivered off-campus at NSIRC, Granta Park, Cambridge.

21. Programme regulations not specified in Senate Regulation 3. Any departure from regulations specified in Senate Regulation 3 must be stated here and approved by Senate.	None
22. Further information about the programme is available from:	http://www.brunel.ac.uk/courses/postgraduate/structural-integrity-msc

23. EDUCATIONAL AIMS OF THE PROGRAMME

The overall objective for the MSc programme is to produce engineering graduates with sound understanding of the specialist knowledge and science underpinning the inspection and evaluation of engineering components and structures with defects and flaws.

The programme specifically aims to produce engineers with in-depth knowledge in the theory and practice of the science and technology of structural integrity, including state-of-the-art methodologies and techniques in inspection.

24. PROGRAMME AND INTERMEDIATE LEARNING OUTCOMES

The programme provides opportunities for students to develop and demonstrate knowledge and understanding (K) cognitive (thinking) skills (C) and other skills and attributes (S) in the following areas:

Level	Category (K = knowledge and understanding, C = cognitive (thinking) skills, S = other skills and attributes)	Learning Outcome	Masters Only	Associated Assessment Blocks Code(s)	Associated Study Blocks Code(s)	Associated Modular Blocks Code(s)
5	K	1. Advanced knowledge and understanding of principles, concepts and theories of underpinning the study of structural integrity. (PGDip, PGCert)				All
5	K	2. Knowledge and understanding of experimental and inspection techniques relevant to structural integrity. (PGDip)				ME5602, ME5628, ME5604, ME5605, ME5611 ME5612
5	K	3. Comprehensive understanding of methods and techniques for modelling, optimisation and analysis of structural integrity. (PGDip)				ME5605 ME5624 ME5612,
5	K	4. Advanced knowledge and understanding of strategic context and importance of project management, and the appropriateness of management techniques				ME5628 ME5604, ME5612

5	K	5. In-depth understanding on the principles and theories of numerical analysis for stress and structural analysis.				ME5600 ME5604 ME5624
5	C	6. Systematically evaluate the appropriate techniques for the solution of engineering problems in structural integrity (PGCert, PGDip)				All
5	C	7. Critical evaluation and awareness of appropriate advanced techniques (PGDip) and current research in a structural integrity area .				ME5600 ME5624 ME5611 ME5612
5	C	8. Analysis, identification, and evaluation of appropriate investigative techniques in structural and stress analysis. (PGCert, PGDip)				ME5600 ME5601 ME5602 ME5628 ME5604 ME5611
5	C	9. Advanced ability to synthesize, analyse, design (PGDip) and provide critical evaluation of how key technologies and architectures can be best exploited in a given application.				ME5600 ME5628 ME5604 ME5605 ME5611
5	C	10. In-depth assembly and critical analysis of data (PGDip)				ME5600 ME5601 ME5628 ME5604 ME5624 ME5611
5	C	11. Analysis and application of appropriate means of personal and resource management techniques.	X			ME5612
5	C	12. Assemble and critically analyse innovative primary, secondary and incomplete data.	X			ME5612
5	C	13. Critically evaluate and apply investigative techniques that are appropriate to the project	X			ME5612
5	C	14. Evaluate critically current research to develop a thesis by presenting a coherent argument	X			ME5612
5	S	15. Design and development skills relevant to structural integrity engineering				All
5	S	16. Effective communication and presentation skills using a variety of methods. (PGCert, PGDip)				All
5	S	17. Management of time and resources for effective learning (PGCert, PGDip)				All

5	S	18. Define and organise a substantial investigation that is informed by the field of study through advanced study	X			ME5612
5	S	19. Ability to define and successfully carry out independent investigations to determine the state of knowledge and research in a specific subject area				ME5628 ME5612
5	S	20. Good coordination and effective management as a member of a team				ME5600 ME5601 ME5628 ME5611

Learning/teaching strategies and methods to enable learning outcomes to be achieved, including formative assessments

Knowledge-and-understanding learning outcomes

The fundamental principles of the learning outcomes are taught through lectures and seminars. Laboratory experiments support learning outcome 2 allowing students to demonstrate and apply key approaches. Learning outcomes 1, 3, 4 and 5 are acquired through summative coursework. Self-study and research will underpin the teaching and learning objectives.

Material will be delivered to allow students to both broaden and deepen their engineering knowledge. This will provide students with fundamental principles covering the breadth of material relevant to this programme which will then be applied to design and project work.

Cognitive skills

Skills 6-11 are taught in lectures, and acquired through a combination of projects and assignments: other skills are acquired through coursework assignments design based project work. Skills 11-14 are acquired through the development of an individual dissertation.

Other skills and attributes

Skills 16, 18 and 19 are acquired through the undertaking of project based work both individually and in teams, as well as the oral presentations.

Many of the skills are acquired through the dissertation project. Namely, skills 17 and 19 through a literature search and review, and skill 18 through the preparation of the dissertation. Skill 20 is acquired through group project based work. Again, self-study and research will underpin the teaching and learning objectives.

Summative assessment strategies and methods to enable learning outcomes to be demonstrated.

Knowledge-and-understanding learning outcomes

These outcomes are assessed using a range of methods that allow students to demonstrate their knowledge and understanding of the subject area through a combination of written assignments and unseen written exams as specified in the module details. Written work and examinations will provide students with the opportunity to demonstrate their ability to apply knowledge and understanding.

Cognitive skills

Skills are assessed using written coursework, essays, project work and unseen written examinations that include problem solving tasks.

Laboratory reports are used to develop skills in the interpretation of experimental and theoretical findings and skills in communication.

Skills 11-14 are assessed through the dissertation project.

Other skills and attributes

Others skills are assessed using oral presentations and technical project reports. The individual dissertation is used to assess a wide range of skills and competences, and to draw together the knowledge and skills developed through the taught part of the programme.

25. Programme Structure, progression and award requirements

Programme structures and features: levels, assessment blocks, credit and progression and award requirements

- **Compulsory block:** one which all students registered for the award are required to take as part of their programme of study. These will be listed in the left hand column;
- **Optional block:** one which students choose from an 'option range'. These will be listed in the right hand column;
- A **core assessment** is an assessment identified within an assessment block or modular block (either compulsory or optional) which must be passed (at grade C- or better) in order to be eligible to progress and to be eligible for the final award. All core assessments must be specified on the programme specification next to the appropriate assessment or modular block:

Where students are expected to pass the block at C- or better, but not necessarily all elements, then the block itself is core.

e.g. AB5500 Project (40)

Core: Block

Where only some elements of assessments are required to be passed at C- or better, these will be identified by listing each element that is core

e.g. ABXXX1 Title (XX credits)

Core: 1 & 4

Where students are expected to pass all assessments in a block then this will be identified. By setting the assessment this way, students are also required to pass the block by default. This will be identified thus:

e.g. ABXXXX Title (XX credits)

Core: All, Block

- A **non-core assessment** does not have to be passed at grade C- or better, but must be D- or better in order to be eligible for the final award.

Level 5

Compulsory assessment block codes, titles and credit	Optional assessment block codes, titles and credits
Compulsory study block codes, titles and credit volume	Optional Study block codes, titles and credit volume
<p>Compulsory modular block codes, titles and credits</p> <p>All modules are 15 credits unless otherwise specified</p> <p>ME5600 Fracture Mechanics and Fatigue Analysis (15) ME5601 Materials – Metallurgy and Materials (15) ME5602 NDT Inspection Methodology (15) ME5628 Codes and Standards in Structural Integrity (15) ME5604 Stress Analysis and Plant Inspection (15) ME5605 Reliability Engineering (15) ME5624 Numerical Modelling of Solids and Structures (15) ME5611 Structural Health Monitoring (15) ME5612 Dissertation (60) for MSc only</p> <p>Core: Block</p>	Optional modular block codes, titles and credits

Level 5 Progression and Award Requirements

[As per Senate Regulation 3](#)

PGDip may not be awarded by substitution of the dissertation (ME5612) for modular/assessment blocks in the taught part of the programme.

Please note: this specification provides a concise summary of the main features of the programme and the learning outcomes that a student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods can be found in the modular block, assessment and study block outlines and other programme and block information. The accuracy of the information contained in this document is reviewed by the University from time to time and whenever a modification occurs.