Programme Specification for Postgraduate Programme Leading to:
MSc Structural Integrity (Asset Reliability Management)

Applicable for all postgraduate students starting in January 2021

Version No.	Date	Notes – QA USE ONLY	QA Initials
2020-21 v1	*7 October 2020*	*Programme Specification updated for 2020/21 entrants. Senate approved that a PGDip may be awarded by substitution of the dissertation for up to 30 credits of modular/assessment blocks in the taught part of the programme, provided the learning outcomes have been met.*	*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	Institution of Mechanical Engineers (IMechE) Institute of Materials, Minerals and Mining (IOM3)
6. Final award(s) and FHEQ Level of Award	MSc Structural Integrity (Asset Reliability Management) FHEQ Level 7
7. Programme title	MSc Structural Integrity (Asset Reliability Management)
8. Programme type (Single honours/joint)	N/A
9. Normal length of programme (in months) for each mode of study	Full time – 12 months – taught off-campus Part time – 24 months– taught off-campus
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	January from 2021
12. Modes of study	Full-Time – taught off-campus and applicable to all award types Part-Time– taught off-campus and applicable to all award types
13. Modes of delivery	Block Mode – taught off-campus
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. HECoS code	100184 100190
17. Route Code	H100PSTINARM
18. Relevant subject benchmark statements and other external and internal reference points used to inform programme design	UK Quality Code for Higher Education 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)
7	K [SM7m]	1. A comprehensive synthesis and understanding of the principles, concepts and theories underpinning the study of structural integrity.				ALL
7	K, C [SM8m]	2. Review and appraise the state of the art in numerical, experimental and / or inspection techniques relevant to structural integrity				ME5601 ME5602 ME5640 ME5612 ME5628 ME5624
7	K, C [SM9m]	3. Critically evaluate and employ appropriate concepts to support the solution of engineering problems in a specific subject area				ME5600 ME5601 ME5640 ME5605 ME5611 ME5612 ME5628 ME5624
7	K, C [EA6m]	4. Systematically evaluate and employ appropriate engineering analysis methods for solving complex structural integrity related problems				ALL
7	K, C [EA5m]	5. Relate fundamental principles, concepts and theories to investigate current research in a structural integrity related area				ME5601 ME5612
7	C [EA7m]	6. Assemble and critically analyse primary, secondary and incomplete data to support your engineering approach in analysing an unfamiliar problem				ME5600 ME5602 ME5640 ME5611 ME5612 ME5628
7	C [D9m]	7. Identify and apply relevant statistical, analytical or testing techniques to minimise				ME5602 ME5605 ME5612 ME5628

		uncertainties in information and quantify its effect on the design				ME5624
7	K [D10m]	8. In-depth knowledge, application and exploitation of current design and certification practices relevant to structural integrity.				ME5602 ME5612 ME5628
7	K, C, S [D11m]	9. Through analysis (or experimental) led design, propose, develop and validate design solutions to address an engineering problem	X			ME5612
7	C [EL8m]	10. Relate the strategic context and importance of professional conduct in engineering				ME5601 ME5602 ME5612 ME5628 ME5624
7	C [EL9m]	11. Classify the commercial and social contexts relevant to structural integrity				ME5611 ME5612 ME5628
7	C, S [EL10m]	12. Systematically evaluate appropriate techniques to manage time and resources to achieve required objectives	X			ME5612
7	K [EL11m]	13. Relate the importance of sustainable development within engineering activities				ME5601
7	K, C [EL12m]	14. Critical evaluation of the regulatory requirements and their importance to structural integrity				ME5600 ME5602 ME5640 ME5612 ME5628
7	C, S [EL13m]	15. Judge evaluations of risk for health and safety, environment and commercial aspects for asset integrity management				ME5602 ME5628
7	K [P12m]	16. In depth analysis of common engineering materials, related to material characterisation, surface engineering techniques and / or engineering failure analyses.				ME5600 ME5601 ME5602 ME5640 ME5612 ME5628 ME5624
7	S [P9m]	17. Develop an independent learning ability to investigate the state of knowledge and research in a specific subject area				ME5601 ME5602 ME5640 ME5605 ME5612 ME5628 ME5624
7	K, C [P10m]	18. Systematically evaluate and apply appropriate engineering techniques, taking into account				ME5602 ME5612 ME5628 ME5624

		commercial and industrial constraints				
7	S [P11m]	19. Successfully plan and manage time and resources to achieve required objectives either individually, or as part of collaborating and /or leading a team				ME5602
7	S [G1]	20. Develop effective problem solving, communication and presentation skills using a variety of methods and resources				ALL
7	C, S [G2]	21. Analysis, reflection and continual adaption of appropriate personal and resource management techniques for effective learning	X			ME5612
7	S [G3m]	22. Plan and execute a substantial individual programme of work to successful completion, through regular monitoring and adaption where necessary	X			ME5612
7	S [G4]	23. Develop initiative and personal responsibility, which may be as a team member, or leader				ME5600 ME5602 ME5612

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, seminars and lab based activities.
- Learning outcomes 1-5, 8-9, 13-14, 16 and 18 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 2-7, 9-12, 14-15, 18 and 21 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 9, 12 and 21 are acquired through the development of an individual dissertation.

Other skills and attributes

- Skill 19 and 23 are acquired through the undertaking of project based work both individually and in teams
- Many skills are acquired through the dissertation project (20-23). 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 9, 12 and 21 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 asses 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 7

Compulsory assessment block codes, titles and credit	**Optional assessment block codes, titles and credits**
Compulsory study block codes, titles and credit volume **FULL TIME (12 Months)** ME5702 Plant Inspection CPD (5) **PART TIME (24 Months)** ME5702 Plant Inspection CPD (5) Either take in Year 1, or Year 2	**Optional Study block codes, titles and credit volume**

Compulsory modular block codes, titles and credits	Optional modular block codes, titles and credits
All modules are 15 credits unless otherwise specified. **FULL TIME (12 Months)** **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) **ME5640** Stress Analysis (15) **ME5605** Reliability Engineering (15) **ME5624** Numerical Modelling of Solids and Structures (15) **ME5611** Structural Health Monitoring (15) **ME5612** Dissertation (60) for MSc only Core: Block **PART TIME (24 Months)** **YEAR 1:** **ME5640** Stress Analysis (15) **ME5600** Fracture Mechanics and Fatigue Analysis (15) **ME5605** Reliability Engineering (15) **ME5628** Codes and Standards in Structural Integrity (15) **YEAR 2:** **ME5601** Materials – Metallurgy and Materials (15) **ME5624** Numerical Modelling of Solids and Structures (15) **ME5611** Structural Health Monitoring (15) **ME5602** NDT Inspection Methodology (15) **YEAR 2 - TERM 3** **ME5612** Dissertation (60) for MSc only Core: Block	

Level 7 Progression and Award Requirements

As per Senate Regulation 3

A PGDip may be awarded by substitution of the dissertation (ME5612) for up to 30 credits of modular/assessment blocks in the taught part of the programme, provided the learning outcomes have been met.