Programme Specification for Programme Leading to:
MSc Oil and Gas Engineering

Applicable for all postgraduate students starting in September 2021

Version No.	Date	Notes – QA USE ONLY	AO
2021-22 v1	*13 August 2021*	*Programme Specification updated for 2021/22 entrants.*	*JP*

Postgraduate Taught Programme	
1. Awarding institution	Brunel University London
2. Teaching institution(s)	Brunel University London (delivered at NSIRC, Granta Park, Cambridge)
3. Home college/department/division	College of Engineering, Design and Physical Sciences/ Department of Mechanical and Aerospace Engineering
4. Contributing college/department/division /associated institution	Structural Integrity Theme/ The National Structural Integrity Research Centre (NSIRC)
5. Programme accredited by	The programme is accredited by IOM3, the IMechE and The Welding Institute
6. Final award(s) and FHEQ Level of Award	Master of Science in Oil and Gas Engineering (FHEQ 7)
7. Programme title	MSc Oil and Gas Engineering
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	Normal length plus two years up to a maximum of 5 years
11. Variation(s) to September start	None.
12. Modes of study	Full-Time – taught off-campus/ Part-Time– taught off-campus and applicable to all award types
13. Modes of delivery	Block Mode – taught off-campus
14. Intermediate awards and titles and FHEQ Level of Award	Postgraduate Diploma in Oil and Gas Engineering (FHEQ 7) Postgraduate Certificate in Oil and Gas Engineering (FHEQ 7)
15. UCAS Code	N/A
16.HECoS Code	100178; 100184; 100190;
17. Route Code	H850POILGAS
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. Engineering Council, UK-SPEC document "Chartered Engineer and Incorporated Engineer Standard"
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)	N/A
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.	N/A
22. Further information about the programme is available from:	Course webpage

23. EDUCATIONAL AIMS OF THE PROGRAMME

The main aim of the programme is to train specialist engineers in the design of oilfield structures, their fabrication and installation. A key feature that distinguishes this programme is its overall ambition to instil systems thinking to specialist engineers by treating those structures and their operating environment holistically as a system and provide the ability and skills to address a wide range of complex engineering problems rapidly. As the industry now seeks the rapid drilling and commissioning of thousands of new wells and, to particularly those for heavy oils and shale oil and gas to meet energy demands, skilled engineers who can rapidly design and commission oilfield installations will be the backbone for growth in this industry. It is precisely these engineers the programme will develop.

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 7	**Category** (K = knowledge and understanding, C = cognitive (thinking) skills, S = other skills and attributes)	**Learning Outcome**	**Masters Award Only**	**Associated Assessment Blocks Code(s)**	**Associated Study Blocks Code(s)**	**Associated Modular Blocks Code(s)**
7	K [SM7M]	Comprehensive understanding of oil and gas engineering including production, off-shore and on-shore structural integrity and multiphase flows;				ME5621, ME5622, ME5623, ME5634, ME5635, ME5638, ME5639, ME5637;
7	K, C [SM8M]	Critical review analysis of, design and assessment of offshore, onshore structures and pipelines;				ME5622, ME5623, ME5634, ME5635, ME5638
7	K, C [SM9M, EL13M]	A systematic understanding and knowledge of technical and functional safety, safety and environmental legislations, and critical awareness of risk				ME5634, ME5635, ME5636, ME5638, ME5637;

		management in the context of the oil and gas industry;				
7						
7	K [EA6M]	Comprehensive knowledge of analytical techniques for whole systems design and optimisation of oil and gas structures;				ME5621, ME5622, ME5623, ME5635, ME5636, ME5638, ME5639, ME5637;
7	K, C [EA5m]	Relate fundamental principles, concepts and theories to investigate current research in oil and gas industry;				ME5622, ME5623, ME5634, ME5635, ME5638, ME5639, ME5637;
7	K, S [SM9M]	Practical and systematic understanding of engineering mathematics, analytical and computational methods for the design and engineering of petroleum structures;				ME5621, ME5623, ME5635, ME5638, ME5639, ME5637;
7	C, S [EA7M, D9M]	Evaluate and critically analyse surface engineering problems using a multidisciplinary systems approach, considering the trade-offs between uncertainty, incomplete data, cost, safety and delivery time;				ME5621, ME5622, ME5623, ME5635, ME5636, ME5638, ME5637;
7	S [D10M]	Critically evaluate different methodologies in the design, specification and operation of oil and gas facilities, including surface production facilities by applying holistic, systems approaches;				ME5622, ME5623, ME5636, ME5638;
7	K, C, S [D11M]	Through analysis (or experimental) led design,				ME5622, ME5636, ME5638;

		propose, develop and validate design solutions to address an engineering problem;				
7	C, S	A comprehensive understanding of professional and ethical responsibility in engineering, adhering to quality and health and safety standards;				ME5634, ME5636, ME5638, ME5637;
7	C, S [EL10M]	Systematically evaluate appropriate techniques to manage time and resources to achieve required objectives;				ME5638, ME5637;
7	K [EL11M]	Relate the importance of sustainable development within engineering activities;				ME5634, ME5636, ME5637;
7	K, C [EL12M]	Critical evaluation of the regulatory requirements and their importance IN oil and gas engineering sector;				ME5621, ME5623, ME5634, ME5635, ME5636, ME5637;
7	K, C [P12M]	In depth analysis of common engineering materials, related to material characterisation, surface engineering techniques and / or engineering failure analyses;				ME5621, ME5622, ME5623, ME5635, ME5638;
7	S [P9m]	Develop an independent learning ability to investigate the state of knowledge and research in a specific subject area;				ME5622, ME5634, ME5635, ME5636, ME5638, ME5639, ME5637;

7	K, C [P10m]	Systematically evaluate and apply appropriate engineering techniques, taking into account commercial and industrial constraints;				ME5622, ME5623 ME5634, ME5635, ME5636, ME5638;
7	S [P11m]	Successfully plan and manage time and resources to achieve required objectives either individually, or as part of collaborating and/or leading a team;				ME5636, ME5638, ME5637;

7	C [G1]	Communicate clearly and effectively original solutions to the engineering problems to specialist and non-specialist audiences;				ME5638, ME5623, ME5636;
	C [EA7M]	Develop originality and skills in the design of experiments including the systematic analysis and interpretation of data.				ME5622, ME5623, ME5635, ME5636; ME5638; ME5637
7	S [G1]	Develop effective problem solving, communication and presentation skills using a variety of methods and resources				ME5621, ME5622, ME5623, ME5635, ME5636, ME5638, ME5639, ME5637;
7	C, S [G2]	Analysis, reflection and continual adaption of appropriate personal and resource management techniques for effective learning; Work independently and demonstrate self-direction but also be constructive and active				ME5622, ME5638;

		contributor to a multi-disciplinary team;				
7	S [G3m]	Plan and execute a substantial individual programme of work to successful completion, through regular monitoring and adaption where necessary				ME5636, ME5638;
	C, S [G4]	Apply effective interpersonal skills and develop leadership potential to drive growth in fast moving and capital-intensive environments				ME5621, ME5634, ME5636,ME5638;

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

Teaching and learning methods are developed in detail within the documentation for each module. The aim of the degree programme is to provide students with effective training in the skills required for a master degree, and subsequently for the work place when they finish their studies, and to empower them with support, to take independent learning for continuing their professional development.

Teaching methods reflect the aim of modules and the demands of subject materials. All modules will be delivered in a block taught mode with a three-week turnaround arrangement. Typically, the first week will be for full time direct contact delivery, including timed lectures, lab and computing sessions appropriate to the individual module. The following two weeks will be for instructed self-study with supplementary tutorials and meeting sessions specific to individual modules. Modules will be delivered at NSIRC site, for the sake of students preparation for industrial environment, including the work on industry driven dissertation projects.

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

The programme employs the traditional assessment methods to test students' ability in applying their knowledge and skills and to measure the achievement of the learning outcomes by individual students. These include exams, course work and assignments. Module leaders are encouraged to make use of formative assessment where appropriate.
The forms of assessment and the assessment criteria will be carefully selected to reflect the defined intended learning outcomes for each module. Our strategy throughout the course is to form a strong, coherent connection between learning outcomes, teaching and learning activities and assessment. This constructive alignment between assessment tasks, learning activities and learning outcomes encourages the right approach to learning by students and ensures that learning outcomes are achieved.

More specifically, the programme will include a variety of methods ranging from formal written examinations, individual and group coursework assignments, oral presentations and structured debates. Presenting the students with a variety of assessment tasks will ensure that the diversity of subject material is appropriately covered. Moreover, considering the specific challenges of an assessment that might put some students at a disadvantage, using several assessment types provides a better chance for successful completion of a module and entire course.
In addition to summative assessment, all modules will include forms of self, peer and formative assessment, which will allow both teachers and learners to monitor the learners' progress and identify gaps in skills and knowledge.

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 D- or better in order to be eligible for the final award.

FHEQ Level 7	
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**
Compulsory modular block codes, titles and credits **FULL TIME (12 Months)** **TERM 1** ME5634 Petroleum Production Fundamentals (15 credits) ME5639 Applied Engineering Mathematics (15 credits) ME5621 Structural Materials (15 credits) ME5622 Structural Integrity and FEA (15 credits) **TERM 2** ME5623 Multiphase Flow Fundamentals and Flow Assurance (15 credits) ME5635 Dynamics of Petroleum Structures (15 credits) ME5636 Design and Construction of Installations (15 credits) ME5637 Reliability Engineering and Risk Management (15 credits) **TERM 3** ME5638 Dissertation (60 credits) **PART-TIME (24 Months)** **YEAR 1** **TERM 1** ME5634 Petroleum Production Fundamentals (15 credits) ME5639 Applied Engineering Mathematics (15 credits) **TERM 2** ME5623 Multiphase Flow Fundamentals and Flow Assurance (15 credits) ME5637 Reliability Engineering and Risk Management (15 credits) **YEAR 2** **TERM 1** ME5621 Structural Materials (15 credits) ME5622 Structural Integrity and Response Analysis (15 credits) **TERM 2** ME5635 Dynamics of Petroleum Structures (15 credits) ME5636 Design and Construction of Installations (15 credits) **TERM 3** ME5638 Dissertation (60 credits)	**Optional modular block codes, titles and credits**
FHEQ Level 7 Progression and Award Requirements As per Senate Regulation 3 A PGDip may be awarded by substitution of the dissertation (ME5638) for up to 30 credits of modular/assessment blocks in the taught part of the programme, provided the learning outcomes have been met.	
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 module outlines and other programme and module information. The accuracy of the information contained in this document is reviewed by the University from time to time and whenever a major modification occurs, and may be checked by the Quality Assurance Agency for Higher Education.	