



Course Specification

Part A

MSc Oil and Gas Engineering EECT058

Faculty of Engineering, Environment and Computing School of Energy, Construction and Environment Academic Year: 2021/22

Please note: This specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities that are provided.

We regularly review our course content, to make it relevant and current for the benefit of our students. For these reasons, course modules may be updated.

More detailed information on the learning outcomes, content, and teaching, learning and assessment methods of each module can be found in the Module Information Directory (MID), student module guide(s) and the course handbook.

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

Coventry University's accreditation with CMI is currently ongoing for the relevant modules and is regularly reviewed and monitored by the CMI through their quality systems. Whilst Coventry University anticipates that these reviews will continue to be successful, if they were to be unsuccessful, the relevant module in this course would no longer be accredited and we would notify applicants and students of this change as soon as possible.

PART A Course Specification (Published Document)

MSc Oil and Gas Engineering

1. Introduction

The oil and gas industry is continuously developing. With oil and gas reservoirs becoming more complex, and the production and processing conditions becoming more challenging globally, there is need to train and prepare engineers in the theory and technical practice of all workflow operations of the industry.

Expected to remain as a major contributor to the economy of many developed and developing regions, the oil and gas industry continues to be driven not only by new discoveries, but also by a constant demand to find newer, safer, more efficient and cost-effective methods of exploring, producing and processing the resources.

Whilst exploration continues to identify major new finds across the world, these are increasingly less accessible and require complex engineering solutions to deliver effective operations and supply. Additionally, the significant and rising operating costs of mature fields and existing installations are driving the sector to seek suitably qualified engineers who are able to support operations and initiate improvements within the main strands of oil and gas exploration, production and processing in challenging offshore, onshore and sub-sea environments.

The MSc Oil & Gas Engineering course has been designed to offer prospective students the opportunity to enhance their engineering knowledge and broaden their operational knowledge with a high focus on employability, developing skills required in the oil and gas engineering environment. It will equip students with the advanced sector-specific knowledge and skills required to succeed in the competitive, ever-evolving energy industry. Students will study the engineering theory, technology, systems and practice associated with the full oil and gas life-cycle, examining upstream, midstream and downstream operations.

From an international perspective the oil and gas industry is recognised as a major component of the economy for many developed and developing regions. Within the continuation of major oil and gas finds globally this sector has a continuously growing life cycle. Suitably qualified engineers will therefore be required to evaluate and initiate improvements within the four main strands of oil and gas facilities (offshore, onshore, sub-sea and pipelines) to help achieve continuation of operations and supply. (With operating costs running at millions of pounds an hour continuation of supply is critical).

This course aims to equip students with sector specific oil and gas engineering, technology and operational skills to succeed in this competitive industry.

This course complements the existing oil and gas courses currently offered at Coventry University. These courses, MSc Petroleum and Environmental Technology and MSc Oil and Gas Management, are centred on environmental issues in the oil and gas industry, and corporate strategic level of oil and gas management, respectively. This MSc Oil and Gas Engineering course presents a supporting engineering element to the oil and gas arena, and course complements the remaining more technical postgraduate sector focused course within Coventry University. While providing some synergy and a very strong engineering route, the MSc Oil and Gas Engineering is heavily focused on the skills and disciplines needed to ensure the effective/efficient operation of an engineering reliant facility and operations.

This course and the new modules it incorporates will be significantly enhanced by the professorial level expertise and associated research active staff the fluid dynamics research team at Coventry University. Coventry University is currently forming collaborations with external facilities as part of the move towards the Coventry University Flow Measurement Research Centre. Currently Coventry University has forged a link with the National Engineering Laboratory (NEL) and it is expected that this collaborations will enhance the course providing the opportunity for potential industrial visits and project topics.

Some of the main distinctive features of the course include:

- Oil and Gas Engineering Sector specific.
- The development of sector focused modules in Materials for Oil and Gas; Durability, Reliability and Sustainability; Fluid Flow Systems and Control Systems and Instrumentation will feature; product knowledge, expert visiting lectures, group work, workshops and sector focused assignments. It is hoped that these modules will have a practical approach to the Oil and Gas industry and create a 'collegiate' feel for the cohort as the students meet up each week in both lectures and tutorials.

- Collaboration between different parts of the School of Energy, Construction and Environment and to capture the wealth of knowledge from two expansive knowledge bases.
- Globally experienced members of staff, with industrial experience, delivering the material.
- High level of industry input into course content and delivery.
- Some existing modules will consist of a one hour generic lecture which will be supported by a 2 hours sector focused tutorial groups where appropriate.
- Delivered of some modules in new EC building which is designed to facilitate small tutorial classes and activity led learning.
- Access to Global Leaders course through the University's Graduate Centre.
- Focus on practical engineering and computing skills.

To increase employability and students experience, all students enrolled in the programme are offered free complementary certification in Institution of Occupational Safety and Health (IOSH) Managing Safely after passing the IOSH Board examination. IOSH is the world's leading chartered professional body and largest membership organisation for professionals responsible for safety and health in the workplace.

As a part of the programme, students are required to undertake an international field trips to observe the activities and operations of key oil and gas equipment and technologies in real world. Evaluation of drilling facilities/operations, petroleum and gas processing plant, control rooms operations, key safety software and best practices reinforces the importance of safe working practices in the oil and gas industry.

As part of this course you will undertake a professional development module which is currently accredited by the Chartered Management Institute (CMI). Upon successful completion of the module, you will gain the CMI Level 7 Certificate in Strategic Management and Leadership Practice at no additional cost.

Work Placement

For students in today's competitive employment markets having work experience can significantly enhance employment prospects. For this reason, the course offers students the opportunity to undertake a work placement, extending the main provision to a two-year course. The work placement could be International or UK with a focus which may be industry or research. Following a selection process within the first semester and subject to securing an approved placement opportunity, students would move onto the two-year course. International students who are interested in a work placement will be supported in completing an application for extending their Student visa by international student support services. Upon completion of their placement, students will return to complete the course and the final project for the full award.

2 Available Award(s) and Modes of Study

Title of Award	Mode of attendance	UCAS Code	FHEQ Level
MSc Oil and Gas Engineering	Full-Time: 1 year;		7
	Part-Time: 2 years		7
	2 years with Work Placement		7
Fallback and/or Alternative Awards:			
PgD Oil and Gas Engineering			
PgC Oil and Gas Engineering			

3 Awarding Institution/ Body

Coventry University

4 Collaboration	N/A
5 Teaching Institution and Location of delivery	Coventry University
6 Internal Approval/Review Dates	Date of approval/latest review: 2018/2019 Date for next review: (Academic year 2024/2025)
7 Course Accredited by	
8 Accreditation Date and Duration	
9 QAA Subject Benchmark Statement(s) and/or other external factors	Although, there is no QAA benchmark statement for MSc in Oil and Gas Engineering, the course is designed to prepare highly skilled engineers and operators for the international oil and gas industry. However, the course has been aligned to the Energy Institute (Chartered Professional Membership: https://www.energyinst.org/membership-and-careers/membership) learning outcomes.
10 Date of Course Specification	Jan 2021
11 Course Director	Dr Enobong Bassey

12 Outline and Educational Aims of the Course

The MSc Oil & Gas Engineering course has been designed explicitly to meet the needs of a highly specialised market tailored to the requirements of an integrated upstream sector. The course provides an educational experience in which students can achieve an integrated understanding of the engineering, technology and environmental strategies within the context of the petroleum industry, while also developing appropriate intellectual and personal skills. In this regard, the educational aims are to:

The course aims are:

- To provide an educational experience that meets students' needs and expectations and those of the oil and gas sectors' employers;
- To provide an up to date curriculum that articulates the current challenges and good practice in the energy industry
- To enhance the student's ability to design appropriate components, systems or processes with an aim to improve the quality and functionality of equipment and plant within individual and complex environments/circumstances focused in the oil and gas arena.
- To evaluate the importance of equipment and plant within an oil and gas facility. The ability to understand concepts surrounding corrosion, life cycle, mechanical principles, control and fluid flow and its combined importance in the continuation of an operational facility.
- To develop the student's practical experience of a wide range of engineering and technology disciplines in order to enable holistic problem solving.
- To prepare the student for tackling complex engineering problems with shifting baselines, and varying degrees of resources and information.

- To enable the student to work in a global engineering industry. This global industry includes large geographically distributed teams, multinational companies and operations, global customer bases, intense markets and international standards.
- To develop a student's ability to communicate clearly in various media, and to argue rationally and draw appropriate conclusions based on a rigorous, analytical and critical approach to data.
- To develop the study skills needed to support the effective written, oral and group working aspects of assignments and individual projects.
- To assess the impact of current engineering forces and technological change upon the effectiveness and efficiency of equipment and plant within the oil and gas industry.

13 Course Learning Outcomes

On successful completion of the course a student will be able to:

1. Apply theories, concepts and processes in oil and gas engineering and processing operations,
2. Analyse methods and global best practices in managing reservoir conditions, fluid flow behaviour and operational concerns in exploration, production and processing of oil and gas,
3. Evaluate fluid flow processes and technologies including surface and subsurface facilities, plan and development of oil and gas resources, and maintenance considerations,
4. Demonstrate effective leadership, technical and problem solving skills in the field of oil and gas engineering within a changing operational and legislative context,
5. Analyse limitations of and apply a range of research methods/techniques, both qualitative and quantitative for providing information and evaluating options in an uncertain and dynamic global oil and gas industry,
6. Conduct research in an ethical manner, and analyse data using appropriate methods, and communicate the output effectively, and
7. Critically evaluate the principles for leading and developing people and equality, diversity and inclusion at a strategic level.

14 Course Structure and Requirements, Levels, Modules, Credits and Awards

The course is designed for those who are interested in a career - or already working - in the energy and hydrocarbon industry. Modules in the course focus on theoretical, policy, design, scientific, technological and operational aspects of oil and gas engineering.

All students will have the Chartered Management Institute (CMI) accredited module, 7049CRB Leading Diverse Workforces. Students who successfully complete the module and meet the CMI learning outcomes will gain a Level 7 Certificate in Strategic Management and Leadership Practice based on the following CMI units: Leading and developing people to optimise performance (unit 702); Strategic approaches to diversity and Inclusion (unit 715).

Students who successfully complete this module will be awarded Foundation Chartered Manager status and be able to use the designation 'fCMgr' after their name.

Work Placement

During semester 1, students who have expressed an interest in undertaking a work placement should begin the application process for placement opportunities. Students have the responsibility for securing a placement, but they will be supported throughout the application process by a specialist employer engagement team. The university will work with employers to identify opportunities. Subject to securing a placement, the International Student Support team will work with international students to obtain UK study visa extensions. Visas required to work in other countries will be the responsibility of the student.

The course is structured so that students complete two semesters of taught modules and then spend three semesters on placement. During this time students would be enrolled onto modules 7102CEM Extended Masters Work Placement A, 7103CEM Extended Masters Work Placement B and 7104CEM Extended Masters Work Placement C. The modules are zero credit and do not contribute to the classification or name of the award but must be passed to complete the placement. Upon completion of the work placement, students are expected to return to Coventry to complete the final semester during which time they undertake their project module. Successful completion of the Work Placement is reflected in the final student transcript.

Credit level	Module Code	Title	Credit Value	Mandatory/ Optional	Course Learning Outcomes
Subject to securing an appropriate placement opportunity and fulfilling the selection requirements, students will be transferred to the two-year course and the Work Placement modules listed below are to be taken.					
7	7102CEM	Extended Masters Work Placement A	0	Optional	
7	7103CEM	Extended Masters Work Placement B	0	Optional	
7	7104CEM	Extended Masters Work Placement C	0	Optional	

The work placement is to be taken over three semesters and prior to the final semester of the course.

14.1 Patterns and modes of attendance

This course is available for study on either a part-time or full-time basis. A student normally begins their studies at the commencement of semester 1 in September.

14.2 Requirements for progression and awards

Awards:

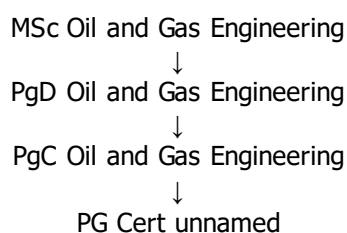
For the award of an MSc in Oil and Gas Engineering a student must have 180 credits from the course and these must include passes in all the modules.

For the award of a PgD in Oil and Gas Engineering a student must have 120 credits from the course and these must include passes in all the modules, except 7049CRB, 7074EXQ, 7165EXQ Research Project.

For the award of a PgC in Oil and Gas Engineering a student must have 60 credits from the course and these must include passes in 7132EXQ, 7133EXQ, 7137EXQ and 7163EXQ.

For the award of an unnamed PgC a student must have any 60 credits from the course.

14.3 Cascade of Awards:



14.4 Course Structure

The course structure of modules is detailed below:

Students studying for a Masters in Oil and Gas Engineering will take eight mandatory modules, along with a CMI (10 credit), and two zero credit tutorial modules and the research project /dissertation module.

The course may accept three intakes per year (September, January and May), the primary intake is in September. To accommodate three starts per year the order in which a student undertakes their taught modules may change as modules are taught in a rolling pattern of delivery. However the dissertation will always be undertaken in the Students' 3rd semester.

Table 1: MSc Oil and Gas Engineering modules, levels of study, pre-co requisites and their credit values
The delivery pattern below is an indication and can be subject to change.

Module Code	Module Title	Credit Value	Semester*	Course Learning Outcomes	MSc
7163EXQ	Process Safety Concepts and Practical Approaches	15	1	1,4	M
7133EXQ	Drilling Engineering	15	1	1,2,3	M
7135EXQ	Petroleum Geosciences	15	1	1,5	M
7136EXQ	Engineering Materials & Corrosion Management in the Energy Industry	15	1	1,2,3	M
7137EXQ	Flow Assurance and Subsea Control Systems	15	2	1,2,3	M
7132EXQ	Petroleum Processing & Gas Technologies	15	2	1,2,3	M
7085EXQ	Reservoir Engineering	15	2	1,2,3	M
7149EXQ	Reservoir Simulation	15	2	1,2,3,4	M
7084EXQ	Supporting Transition to Postgraduate Transition	0	2	4-7	M
7074EXQ	Preparing to Research	0	2	2,5,6	M
7049CRB	Leading Diverse Workforces	10	3	7	M
7165EXQ	Research Project	50	3	1-6	M

Key: M – Mandatory; N/A – Not Applicable; * – indicative only

15 Criteria for Admission and Selection Procedure

A good UK honours degree or an international equivalent (a 2.1 is most preferred but 2.2 may be considered) in engineering or numerate physical sciences, geosciences and mathematics. HND holders (Upper) with at least five years working experience in the oil and gas industry may also be considered. Applicants whose first language is not English or who have not completed a first degree in which English was the main language of tuition must provide evidence of English language ability. An IELTS score of 6.5 or higher (and at least 5.5 in each component) or equivalent qualification is the accepted criterion for admission.

For students entering with advanced standing, the RP(E)L procedure should be outlined. This is a standard university defined process.

16 Academic Regulations and Regulations of Assessment

This Course conforms to the standard [University Academic Regulations](#) Postgraduate Mode R

17 Indicators of Quality Enhancement

The course is managed by the School of Energy, Construction & Environment Board of Study of the Faculty of Engineering, Environment & Computing.

The Programme Assessment Board (PAB) for Energy, Construction & Environment is responsible for considering the progress of all students and making awards in accordance with both the University and course-specific regulations.

The assurance of the quality of modules is the responsibility of the Boards of Study which contribute modules to the course.

External Examiners have the opportunity to moderate all assessment tasks and a sample of assessed work for each module. They will report annually on the course and/or constituent modules and their views are considered as part of the Course Quality Enhancement Monitoring (CQEM). Details of the CQEM process can be found on the Registry's web site. Students are represented on the Student Forum, Board of Study and Faculty/School Board, all of which normally meet two or three times per year. Student views are also sought through module and course evaluation questionnaires.

There is a strong and regular industry input to the subject-base. This is achieved in many ways, for example through the long-standing industry advisory boards, industry-focused collaborative research initiatives and use of guest speakers from industry.

The teaching team includes staff with research experience in Petroleum Engineering, Numerical Simulation of CO₂ Storage; Hydrocarbon Extraction, Geology, Reservoir Simulation and Engineering; Formation Evaluation; Drilling, Well Testing, Completion, Workover and Cementation; Sustainability; Oil Spill Science, Response & Remediation; Reliability Engineering & Process Safety; Produced and Industrial Waste Water treatment; Environmental Impact Assessment; Improved Oil and Gas Recovery; Oilfield Chemistry; Materials Engineering and so on. Staff working experience cuts across international oil companies, national oil companies, and oil & gas service providers etc. in Europe, the Americas, Africa, Asia and New Zealand.

QAA

The report of QAA's Institutional Audit undertaken in 2015 confirmed that

1. The maintenance of the threshold academic standards of awards offered on behalf of degree-awarding bodies and/or other awarding organisations meets UK expectations.
2. The quality of student learning opportunities at the provider meets UK expectations
3. The quality of the information produced by the provider about its provision meets UK expectations.
4. The enhancement of student learning opportunities at the provider meets UK expectations.

18 Additional Information

Enrolled students have access to additional, key sources of information about the course and student support including:

- Faculty/School Handbook
- Student Handbook
- Module Guides
- Module Information Directory
- Study Support information