

## MODULE DESCRIPTOR

### Module Title

Wells

Reference	ENM201	Version	12
Created	March 2023	SCQF Level	SCQF 11
Approved	May 2006	SCQF Points	15
Amended	July 2023	ECTS Points	7.5

### Aims of Module

The module provides a broad understanding of the principles of well construction required to develop a basis for design and an operational plan for drilling and completions, specifically from the perspective of well integrity.

### Learning Outcomes for Module

On completion of this module, students are expected to be able to:

- 1 Critically evaluate rig types, rig systems, and drilling components to be utilised for drilling a designated well, including the functions of the equipment.
- 2 Evaluate cement and drilling fluids functions and properties.
- 3 Evaluate drilling problems and measures to mitigate them.
- 4 Design the drilling bit hydraulics for specific well operations.
- 5 Evaluate the concepts of fluid flow in porous media and conduits and application to the analysis of inflow performance and vertical lift performance.

### Indicative Module Content

1. Introduction, History, People, Well Lifecycle, Rig Components. 2. Drilling Process & Design, Drilling Process, Casing String. 3. Well Control, Barriers, Pressures. 4. Fluids (Muds & Cements), Drilling Fluids, Cements & Cementing. 5. Drill string & Ancillaries, BHA & Tool string, Introduction to Rock Bits, Rock Stresses & Pressures, Cement Basics & Chemistry. 6. Completion Essentials, Completion Function, Operations & Design Process, Completion Architecture & Equipment Selection, Tubing Specification & Equipment Material Selection, Safety Systems and Life of Well Integrity Management, Perforation and Sand Control, Well production performance & nodal systems analysis, Well Inflow Performance and Skin, Multiphase Flow & Vertical Lift Performance, Artificial Lift Options.

### Module Delivery

The module will be delivered by means of face to face and blended learning including seminars, lectures, site visits (full-time) and part-time (online learning part-time) lectures, tutorials, student-centred learning activities, and self-guided study. Emphasis is placed on an integrative approach to communication, engagement and learning, with student involvement fostered through discussion and group work.

### Indicative Student Workload

	Full Time	Part Time
Contact Hours	35	35
Non-Contact Hours	115	115
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	150	150
<i>Actual Placement hours for professional, statutory or regulatory body</i>		

### ASSESSMENT PLAN

*If a major/minor model is used and box is ticked, % weightings below are indicative only.*

#### Component 1

Type:	Examination	Weighting:	100%	Outcomes Assessed:	1, 2, 3, 4, 5
Description:	Closed book examination.				

### MODULE PERFORMANCE DESCRIPTOR

#### Explanatory Text

Component 1 comprises 100% of the module grade. To pass the module, a D grade is required.

Module Grade	Minimum Requirements to achieve Module Grade:
<b>A</b>	A
<b>B</b>	B
<b>C</b>	C
<b>D</b>	D
<b>E</b>	E
<b>F</b>	F
<b>NS</b>	Non-submission of work by published deadline or non-attendance for examination

### Module Requirements

Prerequisites for Module	Normally a 2.2 UK honours degree in Engineering or a related discipline, and proficiency in English language for academic purposes (or IELTS score of 6.5 or equivalent).
Corequisites for module	None.
Precluded Modules	This module is not suitable for students following an MSc in Professional Studies programme unless they meet the entry qualifications stipulated in the University Regulations on admission and the prerequisites above.

**ADDITIONAL NOTES**

Part Time refers to Online Learning Part Time.

**INDICATIVE BIBLIOGRAPHY**

- 1 AADNOY, B.S., 2010. Modern well design. CRC Press
- 2 BOURGOYNE, A.T., MILLHEIM, K.K., CHENEVERT, M.E. and YOUNG, F.S., 1986. Applied drilling engineering. Richardson, Texas: Society of Petroleum Engineers.
- 3 CAENN, R., DARLEY, HCH., and GRAY, GR. 2017. Composition and Properties of Drilling and Completion Fluids. Elsevier, Gulf Professional Publishing.
- 4 GEFEI, L. 2021. Applied Well Cementing Engineering. Gulf Professional Publishing.
- 5 JONATHAN, B. 2009. Well completion design. Elsevier Science & Technology.
- 6 RABIA, H. 1985. Oilwell Drilling Engineering. Graham and Trotman.
- 7 ROBINSON, H. and GARCIA, J. 2015. Drillers knowledge book: creative solutions for today's drilling challenges. Houston, Texas: International Association of Drilling Contractors.
- 8 Journal articles, conference proceedings, and appropriate websites. Example OnePetro, Knovel, ASME.