

MODULE DESCRIPTOR

Module Title

Subsurface

Reference	ENM200	Version	14
Created	March 2023	SCQF Level	SCQF 11
Approved	April 2006	SCQF Points	15
Amended	July 2023	ECTS Points	7.5

Aims of Module

The aim of the module is to integrate knowledge of petroleum geology and the properties of petroleum fluids to develop an understanding of reservoir engineering and formation evaluation and demonstrate how the value of a hydrocarbon accumulation is created.

Learning Outcomes for Module

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

- 1 Appraise the geological processes of hydrocarbon formation and accumulations including application to carbon capture and storage in underground systems (CCUS).
- 2 Critically evaluate the essential tools available for finding, characterising, quantifying and appraising hydrocarbon reserves throughout the field lifecycle.
- 3 Analyse reservoir and fluid properties from surface and down-hole measurements for the purpose of estimation of initial and remaining reserves.
- 4 Critically evaluate the principles of formation evaluation and their application in oilfield development.

Indicative Module Content

Principles of geology and their application to the origin, entrapment, exploration and extraction of hydrocarbons. Concepts of reservoir engineering; properties of reservoir rock, fluid distribution and properties, porosity systems and permeability and production chemistry. Dynamics of fluid flow in reservoirs, static pressure and well-test analysis and PVT analysis. Determination of hydrocarbon volumes, estimation/classification of reserves and essentials of recovery methods. Concepts of formation evaluation and geophysical prospecting methods. Energy Transition: Application of Carbon capture and storage in underground systems (CCUS)

Module Delivery

The module will be delivered through blended learning including lectures, tutorials, site visits and guided self-study.

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
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:
A	A
B	B
C	C
D	D
E	E
F	F
NS	Non-submission of work by published deadline or non-attendance for examination

Module Requirements

Prerequisites for Module	Normally a UK 2.2 honours degree or above, in Engineering or a related discipline. Proficiency in English language for academic purposes, or IELTS score of 6.5 or above.
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.

INDICATIVE BIBLIOGRAPHY

- | | |
|---|---|
| 1 | STONELEY, R., Introduction to Petroleum Exploration for Non-Geologists (OUP,1995,ISBN 0198548567); 1995 |
| 2 | ARCHER, J.S., WALL, C.G., Petroleum Engineering: Principles and Practice (Graham & Trotman,1986,ISBN 0860106659); 1986 |
| 3 | JAHN, F., COOK, M., GRAHAM, M., Hydrocarbon Exploration and Production (Elsevier,1998,ISBN 0444829210) (2nd Edition); 2008 |
| 4 | DAKE, L.P.,The Practice of Reservoir Engineering (Revised Edition); Elsevier,2013 |
| 5 | LI, Yaoguo., KRAHENBUHL, Richard., Gravity and Magnetic Methods in Mineral and Oil & Gas Exploration and Production (EAGE,2015) |
| 6 | SIMM, R., BACON, M., Seismic Amplitude: An Interpreter's Handbook (Cambridge University Press,2014) |
| 7 | ASQUITH, George B., KRYGOWSKI, Daniel., Basic Well Log Analysis (American Association of Petroleum Geologists,2004) |
| 8 | SKINNER, Brian J., PORTER, Stephen C., PARK, Jeffrey., The Dynamic Earth: An Introduction to Physical Geology (Wiley,2004) |