Module Title **Oil And Gas Engineering B** **Keywords** Petroleum Geology, Reservoir Drive Mechanisms	Reference EN4581 SCQF SCQF Level 10 SCQF Points 15 ECTS Points 7.5 Created May 2002 Approved March 2004 Amended August 2011 Version No. 2

This Version is No Longer Current

The latest version of this module is available here

Prerequisites for Module

Offshore Engineering (EN3581)

Corequisite Modules

None.

Precluded Modules

None.

Aims of Module

To provide the student with the ability to apply the principles of petroleum geology, the properties of petroleum fluids and basic reservoir engineering.

Learning Outcomes for Module

Indicative Student Workload

Contact Hours	Full Time	Part Time
Assessment	10	10
Lectures	40	40
Tutorials	10	10
Directed Study		
Directed Study	20	20
Private Study		
Private Study	70	70

Mode of Delivery

This is a lecture based module supplemented by tutorials, coursework and student-centred learning.

Assessment Plan

Learning Outcomes Assessed

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

1. Apply geological knowledge to the interpretation of exploration data.
2. Relate fluid and reservoir properties to drive mechanisms.
3. Relate the phase behaviour of the reservoir fluids to the production characteristics of the reservoir.
4. Apply material balance methods to predict production behaviour.
5. Predict reservoir and wellbore flow regimes, select and apply well completion and sub surface equipment.

Indicative Module Content

Principles of geology and their application to the origins of petroleum and its entrapment; geophysical survey methods and sub-surface mapping. Composition of oil and gas; properties of hydrocarbon gases and liquids; behaviour of real gases, compressibility factors, equations of state; phase behaviour of hydrocarbon systems. Production facilities. Oil and gas reservoirs; properties of reservoir rocks, fluid distributions, formation

Component 1	1
Component 2	1,2,3,4,5

Component 2 is a closed book examination. (70% weighting)

Component 1 is coursework based on a single case study. (30% weighting)

Indicative Bibliography

1. Lyons, William, Plisga Gary J. and Lorenz Michael, 3rd edition 2015. Standard Handbook of Petroleum and Natural Gas Engineering. Houston, Texas: Gulf Publishing.
2. Selley, Richard C., Third edition 2015. Elements of Petroleum Geology. San Diego, CA : Academic Press, [2015]
3. DAKE, L. 2001. The Practice of Reservoir Engineering. Amsterdam: Elsevier.
4. JAHN, F., COOK, M. AND GRAHAM, M., 2nd ed. M. 2008. Hydrocarbon Exploration and Production. Amsterdam: Elsevier.
5. ECONOMIDIES, M. J., HILL, A. D and EHLIG--ECONOMIDIES, C., 2nd edition 2013. Petroleum Production Systems. Upper Saddle River, NJ : Prentice Hall, c2013.

volume factors, drive mechanisms, primary, secondary and enhanced recovery; evaluation of reserves; application of material balance methods. Flow dynamics of reservoirs. Steady-state and unsteady-state flow, pressure distributions, formation damage, stimulation. Completion methods and their selection and application, perforating, sub-surface packers and safety valves. Field processing, vapour-liquid equilibria. Flash calculations, separator systems, hydrate formation and prevention, dehydration and sweetening.