MODULE DESCRIPTOR

Module Title

Well Completions and Subsea Systems

Reference	ENM206	Version	11
Created	March 2024	SCQF Level	SCQF 11
Approved	April 2006	SCQF Points	15
Amended	May 2024	ECTS Points	7.5

Aims of Module

The module imparts a comprehensive understanding of applying completion technologies to address specific challenges in petroleum production. It also aims to develop an ability to integrate these technologies in the complex system represented by the subsea environment, in terms of stress analysis, well intervention interfaces, hydrodynamic forces and the design and operation attributes of subsea flowlines and multiphase pump.

Learning Outcomes for Module

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

1	Critically analyse the fundamental principles governing fluid flow in porous media and conduits, considering their impact on inflow performance and vertical lift performance, with the ultimate goal of optimizing well production.
2	Critically appraise a variety of conceptual solutions for the design of lower and upper completions with their associated rewards and limitations.
3	Evaluate well tubing string design by conducting stress analysis calculations with appropriate design safety factors.
4	Critically evaluate and recommend functional capability of well intervention techniques for a variety of situations.
5	Prepare a plan for commissioning subsea well production, with the potential impact of flow assurance considerations and transient multi-phase flow phenomenon while mitigating the impact of hydrodynamic phenomena on marine risers and flowlines.

Indicative Module Content

Well production performance (Infow - Outflow), Skin, Productivity Index, Nodal system analysis, Sand Control, Completion Design (Lower - Upper), Completion Essentials, Packers, Wellheads, Christmas tree, Well Integrity Managment, Tubing Stress Analysis, Tubing Mechanical Properties, Tubing Material Selection, Perforating, Coiled Tubing Intervention, Coiled Tubing Forces, API / ISO Specs, Deepwater, Subsea Controls, Combined Operations, Transient Flow & Terrain Slugging, Hydrodynamics, Multiphase Boosting, Flowlines,

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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 collaborative 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
Actual Placement hours for professional, statutory or regulatory body		

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:
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	None.
Corequisites for module	None.
Precluded Modules	None.

ADDITIONAL NOTES

Part Time refers to Online Learning Part Time.

INDICATIVE BIBLIOGRAPHY

1	AMERICAN PETROLEUM INSTITUTE, Miscellaneous Recommended Practices, Specifications & Bulletins from Series 5 "Tubular Goods" and Series 17 "Subsea Production Systems". Washington: API/ISO.
2	BELLARBY, J. 2009. Well Completion Design. Oxford. Elsevier.
3	CLEGG, J.D., 2007. Petroleum Engineering Handbook, Vol IV Production Operations Engineering. Richardson, TX: SPE.
4	ECONOMIDES, M.J., ed. 1998. Petroleum Well Construction. Chichester: John Wiley & Sons.
5	CRUMPTON, H., 2018. Well Control for Completions and Interventions. Scotland: Gulf Professional Publishing.
6	GUO, B., et al 2007. Petroleum Production Engineering: A Computer Assisted Approach. Burlington, MA: Gulf Professional Publishing.
7	Journal articles, conference proceedings, and appropriate websites. Example OnePetro, Knovel, ASME.
8	KING, G. E., 1998. An Introduction to the Basics of Well Completions, Stimulations and Workovers. Tulsa, OK: George E. King.