

COURSE TITLE	OFFSHORE AND SURFACE OPERATION
COURSE CODE	01CH0613
COURSE CREDITS	3

Objective:

- 1 Student will be able to gain knowledge of various process and structures involved in offshore and surface operations.

Course Outcomes: After completion of this course, student will be able to:

- 1 Demonstrate the understanding of different types phase separator.
- 2 Apply the fundamental principles of operation of demulsification, dehydration and desalting of oil.
- 3 Differentiate and correlate various offshore and surface operation
- 4 Evaluate the selection and application of various types of platforms used in offshore operations.

Pre-requisite of course:Drilling Engineering, Reservoir Engineering

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
3	0	0	50	30	20	0	0

Contents : Unit	Topics	Contact Hours
1	Surface facilities for Production System Group Gathering Station, Central Tank farm, Feeder and Trunk pipeline system,, Fire protection systems for tank farm pumping /compressor stations,, transportation modes & dispatch.	6
2	Separation and Treatment of produced fluid Two phase oil and gas separation: Functional sections of a gas-liquid separator, Inlet diverter section, Liquid collection section, Gravity settling section, Mist extractor section, Equipment description of different separators, Scrubbers, Slug catchers, Selection considerations., Three phase oil and water separation: Equipment description, Horizontal separators, Free-water knockout, Flow splitter, Horizontal three-phase separator with a liquid “Boot”, Vertical separator, Crude oil treatment: Dehydration & Desalting of oil, Demulsification, Effluent Treatment, Scale & Paraffin Deposition and their Mitigation.	12

Contents : Unit	Topics	Contact Hours
3	Overview of offshore structures Introduction, Deepwater challenges, Functions of offshore structures, Offshore structure configurations, , Types and classification of Offshore Platforms. Offshore logistics, Drilling and completing in shallow water and its associated problems, systems for offshore operations, Oil Processing in Offshore and Comparison with onshore.	12
4	Offshore Platforms Fixed offshore platform design: Field development and concept selection activities, Basic and detailed design of a fixed jacket, Tower-type offshore platform., Floating offshore platform design: Introduction, Floating platform types, Design of floaters, Floating production storage and offloading systems, mooring and anchoring systems, Fundamental aspects of the design of FPSO., Semi submersibles: Tension leg platforms, Spar design, Hull structure, Construction and Installation.	10
Total Hours		40

Textbook :

- 1 Surface operations in petroleum production, I and II, Chilingarian, G. V., Robertson, J. O., & Kumar, S. , Elsevier, 1987
- 2 Handbook of Offshore Engineering (2-volume set), Chakrabarti, S., Elsevier, 2005

References:

- 1 Hydrodynamics of offshore structures, Hydrodynamics of offshore structures, Chakrabarti, S. K., WIT press, 1987
- 2 Offshore Operations and Engineering, Offshore Operations and Engineering, Singh, S. S. P., Agarwal, J., & Mani, N. , CRC Press, 2019

Suggested Theory Distribution:

The suggested theory distribution as per Bloom’s taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery					
Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking / Creative
10.00	20.00	25.00	25.00	10.00	10.00

Instructional Method:

- 1 The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

Instructional Method:

- 2 The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.
- 3 Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.
- 4 Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory

Supplementary Resources:

- 1 https://onlinecourses.nptel.ac.in/noc24_oe03/preview