

Health, Safety and Environmental Management in Petroleum and Offshore Engineering - Web course

COURSE OUTLINE

Course objectives:

The course will give an overview of the safety and environmental issues in the petroleum industry.

It will provide detailed understanding of the methods and techniques to resolve these key issues for making petroleum production and processing, cleaner and safer.

This course would educate students to identify and assess hazards in any stage of operation, to quantify and manage them as well.

This course will also highlight lessons learnt from the past accidents.

Course contents:

Introduction to safety, health and environmental management- Basic terms and their definitions- Importance of safety- safety assurance and assessment- safety in design and operation- organizing for safety.

Hazard classification and assessment- hazard evaluation and hazard control.

Environmental issues and Management- atmospheric pollution- flaring and fugitive release- water pollution- drilling waste, produced water, oil spills, cooling water, processed water- soil waste- rock cutting.

Oil sludge, drilling solid waste, production waste- Environmental monitoring- environmental impact and decommissioning- environmental management.

Accidents modeling- release modeling- fire and explosion modeling- toxic release and dispersion modeling- accident investigation and reporting- concepts of HAZOP and PHA.

Safety measures in design and process operations- inerting, explosion, fire prevention, sprinkler systems

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Ocean Engineering

Coordinators:

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Risk assessment and management- Risk picture- definition and characteristics- risk acceptance criteria- quantified risk assessment- hazard assessment- fatality risk assessment.

Marine systems risk modeling- risk management principles and methods and concept optimization for offshore petroleum industry.

Analysis of case studies from offshore and petroleum industry.

COURSE DETAIL

Module No	Topic/s	No.of Lectures
1st Module	Introduction to safety,health and environmental management. Basic terms and their definitions. Importance of safety in petroleum and offshore industry. Safety assurance and assessment. Safety in design and operation. Organizing for safety. Hazard classification and assessment. Hazard evaluation and hazard control.	10
2nd Module	Environmental issues and Management. Atmospheric pollution. Flaring and fugitive release. Water pollution- drilling waste, produced water, oil spills, cooling water, processed water- soil waste- rock cutting, oil sludge, drilling solid waste, production waste. Environmental monitoring. Environmental impact and decommissioning . Environmental management.	10
3rd Module	Accidents modeling- release modeling. Fire and explosion modeling. Toxic release and dispersion modeling. Accident investigation and reporting.	15

	<p>Concepts of HAZOP and PHA. Risk assessment and management. Risk picture- definition and characteristics. Risk acceptance criteria. Quantified risk assessment. Hazard assessment. Fatality risk assessment. Marine systems risk modeling. Risk management.</p>	
4th Module	<p>Safety measures in design and process operations- inerting, explosion, fire prevention, sprinkler systems. Principles and methods and concept optimization for offshore petroleum industry. Analysis of case studies from offshore and petroleum industry.</p>	5
	Total	40

References:

1. Skelton, B. (1997). *Process safety analysis*, Gulf Publishing Company, Houston, 210pp.
2. Jan Erik Vinnem (2007). *Offshore Risk Assessment: Principles, Modeling and Applications of QRA studies*. Springer, 577pp.
3. Terje Aven and Jan Erik Vinnem. (2007). *Risk Management with applications from Offshore Petroleum Industry*. Springer, 200pp.
4. Jorg Schneider. (1997). *Introduction to Safety and Reliability of Structures*. Structural Engineering Documents Vol. 5, International Association for Bridge and Structural Engineering (IABSE), 138pp.
5. Lees, F.P. (1996). *Loss Prevention in Process Industries: Hazard identification, Assessment and Control*, Vol. 1-3, Butterworth-Heinemann, Oxford, 1245pp.
6. Patin, Stanislav. (1999). *Environmental Impact of the Offshore Oil and Gas Industry*. Eco Monitor Publishing, USA, 425pp.
7. William J. Cairns (Ed), 1992. *North Sea Oil and the Environment: Development Oil and Gas Resources, Environmental Impacts and Responses*, International

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