Course Code	Course Title	ECTS Credits
OGEE-400	Safety & Reliability Engineering	6
Department	**Semester**	**Prerequisites**
Engineering	Fall, Spring	OGEE-290
Type of Course	**Field**	**Language of Instruction**
Required	Oil & Gas Engineering	English
Level of Course	**Year of Study**	**Lecturer(s)**
1st Cycle	4th	Prof Ioannis Bakouros
Mode of Delivery	**Work Placement**	**Co-requisites**
Face-to-face	N/A	None

Objectives of the Course:

The main objectives of the course are to:
- Familiarize students with the fundamental principles of safety and reliability that must be addressed throughout the life cycle of engineering systems
- Discuss the fundamental requirements for the reliability, safety, health and environment in Petroleum Industry
- Develop and discuss measures for reliability and safety
- Transfer knowledge on formal safety assessment hazard identification, performance standards and acceptance criteria, hazard or consequence analysis, risk analysis.
- Discuss methods to identify failure distribution and associated reliability functions, calculate industry-relevant metrics and build simple models.
- Familiarize students with simple system techniques and processes including probability plotting, failure data analysis, confidence limits and hypothesis testing, reliability-centered maintenance and reliability block diagram

Learning Outcomes:

After completion of the course students will be able to:
- Demonstrate an understanding of professional and ethical responsibility
- Define and develop measures for reliability and safety
- Design a system, component, or process to meet desired reliability needs – design for reliability
- Model reliability by various life distributions
- Compute system reliability
- Estimate reliability by product testing
- Understand design and management of reliability programs
- Relate reliability and safety factor
- Assess formal safety; identify hazard, performance standards and acceptance criteria and perform hazard and risk analysis.

Course Contents:

- Introduction to Reliability Engineering
- Reliability Mathematical concepts in Engineering
- Life Data Analysis and Probability Plotting
- Monte Carlo Simulation
- Load–Strength Interference
- Effect of Safety Margin and Loading Roughness on Reliability
- Identification, design, analysis, verification and validation for Reliability Process
- Reliability Testing
- Design of Experiments and Analysis of Variance. Engineering Interpretation of Results
- Maintainability, Maintenance and Availability
- Failure Interactions.
- System Safety Analysis.
- Safety and Product Liability
- Probabilistic Safety Assessment
- Applications of Probabilistic Safety Assessment
- Standards for Reliability, Quality and Safety

Learning Activities and Teaching Methods:

Lectures, in-class examples, exercises

Assessment Methods/Reading:

Homework, tests, final exam

Required Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
Patric O'Connor, Andre Kleyner	Practical Reliability Engineering	Wiley	2012	9780470979815

Recommended Textbooks/Reading:

Authors	Title	Publisher	Year	ISBN
Verma Ajit Kumar, Ajit Srividya, Karanki Durga Rao	Reliability and Safety Engineering	Springer	2010	9781849962322