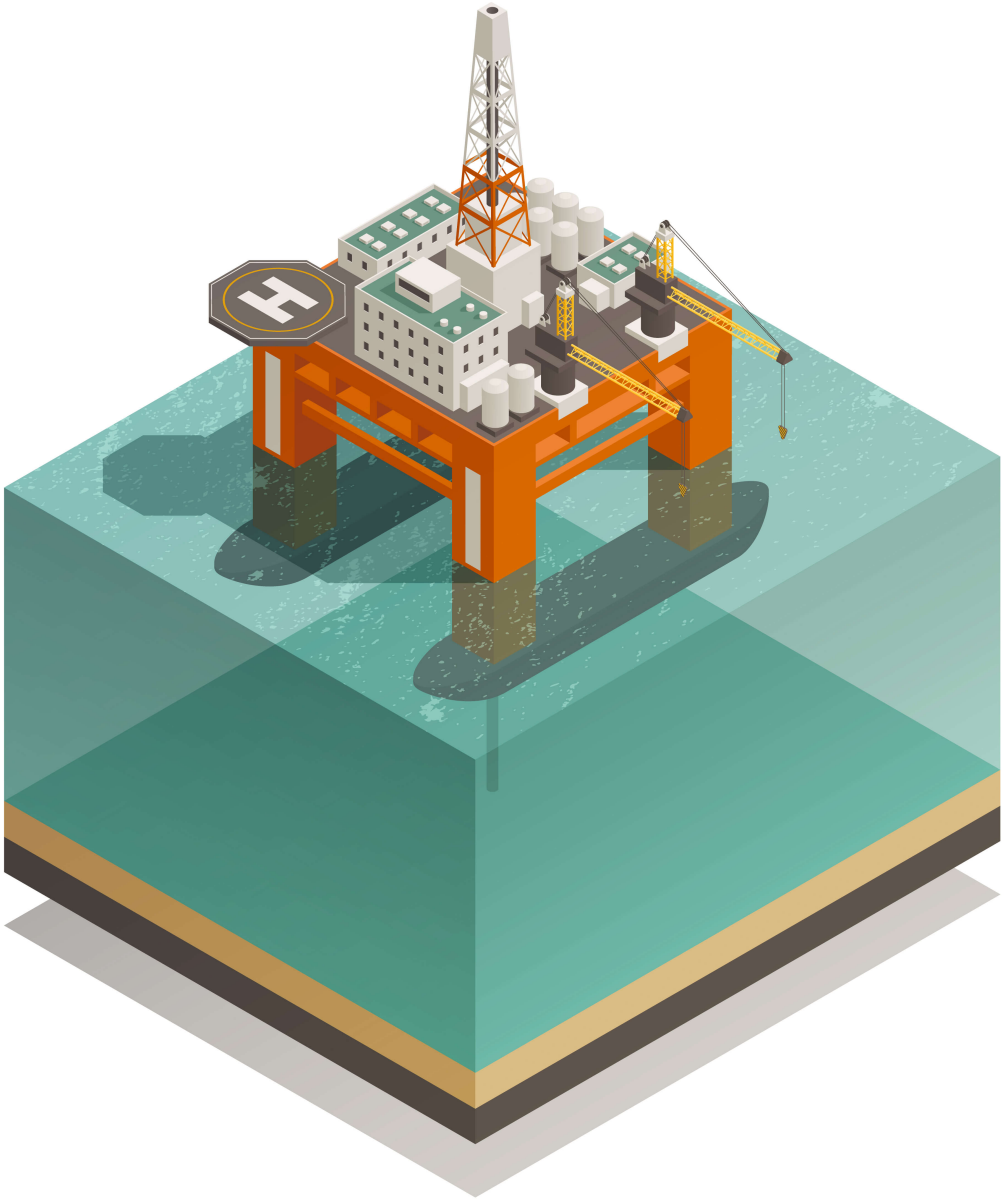


# Foundation of Marine Engineering and Stability

**Duration:** 5 Days

**Language:** en

**Course Code:** IND22-101

## Objective

Upon completing this course, participants will be able to:

1. Understand the principles of buoyancy and stability in marine vessels.
2. Perform stability calculations for various load and operational conditions.
3. Analyse structural strength to ensure vessel integrity under normal and extreme conditions.
4. Apply marine engineering principles to enhance safety and operational efficiency.
5. Address Safety Challenges in Marine Environments
6. Participate in practical exercises to apply theoretical knowledge, including stability calculations, structural evaluations, and scenario-based problem-solving.

## Audience

This course is designed for:

- Marine engineers and naval architects.
- Ship operators and safety officers.
- Offshore operations personnel.
- Professionals involved in ship design, construction, and maintenance.
- Individuals seeking foundational knowledge of marine engineering and ship stability.

## Training Methodology

The course employs a combination of lectures, case studies, and hands-on activities to ensure participants gain both theoretical and practical insights. Lectures cover the core principles of marine engineering and stability, while case studies highlight real-world challenges and solutions in ship operations. Practical workshops and calculations enhance understanding, and group discussions encourage collaborative problem-solving. Assessments and quizzes ensure participants can apply key concepts effectively.

## Summary

This course offers a foundational understanding of marine engineering principles and ship stability. Participants will explore the fundamentals of buoyancy, stability, and structural strength, learning how these principles are applied in ship design, operation, and safety. The course emphasises real-world applications, including stability calculations, structural analysis, and addressing challenges in marine environments.

## Course Content & Outline

**Section 1: Introduction to Marine Engineering and Stability**

- Explore the fundamentals of buoyancy and Archimedes' principle.
- Understand the concept of displacement and its relevance to vessel design.
- Define stability and its significance in ship operations.

**Section 2: Principles of Buoyancy and Stability**

- Learn about hydrostatics and the calculation of centre of gravity and buoyancy.
- Analyse factors affecting stability, including load distribution and free surface effect.
- Explore the impacts of ship motion and wave interactions on stability.

**Section 3: Stability Calculations and Analysis**

- Perform intact stability calculations, including metacentric height (GM).
- Evaluate damaged stability scenarios and their implications on safety.
- Analyse loading conditions and develop stability curves to ensure compliance with safety regulations.

**Section 4: Structural Strength Fundamentals**

- Understand stress and strain in ship structures under static and dynamic loads.
- Explore material properties and their applications in marine engineering.
- Analyse hull girder strength, including bending moments and shear forces.

**Section 5: Safety Considerations in Marine Environments**

- Discuss international safety standards and regulations, including SOLAS.
- Address challenges in extreme marine conditions, such as storms and collisions.
- Explore technological advancements in ship stability and safety monitoring.

**Section 6: Practical Workshops and Case Studies**

- Hands-on activities, including stability calculations and structural analysis.
- Review real-world examples of stability challenges and structural failures.
- Develop strategies to mitigate risks and enhance vessel performance.

## Certificate Description

Upon successful completion of this training course, delegates will be awarded a Holistique Training Certificate of Completion. For those who attend and complete the online training course, a Holistique Training e-Certificate will be provided.

Holistique Training Certificates are accredited by the British Assessment Council (BAC) and The CPD Certification Service (CPD), and are certified under ISO 9001, ISO 21001, and ISO 29993 standards.

CPD credits for this course are granted by our Certificates and will be reflected on the Holistique Training Certificate of Completion. In accordance with the standards of The CPD Certification Service, one CPD credit is awarded per hour of course attendance. A maximum of 50 CPD credits can be claimed for any single course we currently offer.

## Categories

Energy and Oil & Gas, Engineering, Health, Safety & Environment HSE, Marine and Coastal

## Tags

Risk Mitigation, HSE, safety, marine, Load Analysis, Marine Safety, Structural Strength, Vessel Design, Stability Calculations, Structural Analysis

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