Coastal Engineering Training Course

Professional Development Training Course Outline

Category	Construction Institute	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Coastal Engineering Training Course is designed to equip professionals with advanced knowledge of coastal resilience, shoreline protection, marine infrastructure design, climate adaptation, and sustainable coastal management. With increasing challenges from sea-level rise, coastal erosion, storm surges, extreme weather events, and ocean climate variability, this training provides practical solutions based on modern coastal engineering technologies, nature-based solutions (NbS), digital coastal modeling, and integrated coastal zone management (ICZM). Participants will gain expertise in designing and managing sustainable coastal systems using innovative engineering approaches, advanced numerical modeling tools, and global best practices.

The course integrates theoretical concepts, engineering applications, real-world case studies, and industry-driven practices to develop expertise in coastal hydraulics, sediment transport analysis, breakwater and seawall design, beach nourishment, offshore structures, marine renewable energy infrastructure, and climate-resilient coastal development. Through interactive learning, simulations, and practical exercises, participants will understand how to address complex coastal challenges while supporting blue economy growth, environmental sustainability, disaster risk reduction, and resilient coastal communities.

Programme Curriculum

Coastal Engineering Training Course

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Course Duration

5 days

Course Objectives

1. Develop advanced understanding of coastal engineering principles and applications.
2. Master techniques for coastal erosion assessment and shoreline management.
3. Learn modern approaches for climate-resilient coastal infrastructure design.
4. Understand wave dynamics, coastal hydrodynamics, and sediment transport processes.
5. Apply numerical modeling and simulation tools for coastal analysis.
6. Design sustainable shore protection structures and marine engineering systems.
7. Implement nature-based coastal solutions and ecosystem restoration strategies.
8. Analyze impacts of sea-level rise and climate change adaptation measures.
9. Improve skills in coastal hazard mapping and disaster risk management.
10. Understand principles of integrated coastal zone management (ICZM).
11. Explore innovations in smart coastal monitoring and digital engineering technologies.
12. Develop knowledge of sustainable marine infrastructure and blue economy solutions.
13. Apply international standards and best practices in coastal resilience planning.

Target Audience

1. Coastal Engineers and Marine Engineers
2. Civil and Environmental Engineers
3. Oceanographers and Marine Scientists
4. Government Coastal Planning Authorities
5. Port and Harbor Development Professionals
6. Environmental Consultants and Sustainability Specialists
7. Researchers and Academic Professionals
8. Infrastructure Project Managers and Consultants

Course Modules

Module 1: Fundamentals of Coastal Engineering

- Coastal engineering concepts, processes, and applications
- Coastal zones, wave characteristics, tides, and currents
- Coastal geomorphology and shoreline evolution
- Marine environment interactions and engineering challenges
- Global trends in coastal resilience engineering
- Case Study: Netherlands Delta Works – Advanced flood protection and climate adaptation strategies

Module 2: Coastal Hydrodynamics and Wave Modeling

- Wave generation, transformation, and breaking processes
- Tidal circulation and coastal current analysis
- Storm surge prediction and modeling techniques
- Numerical simulation of coastal water movements
- Application of hydrodynamic models in coastal projects
- Case Study: Venice MOSE Barrier System – Hydrodynamic control for flood protection

Module 3: Coastal Erosion Management and Shoreline Protection

- Causes and impacts of coastal erosion
- Shoreline monitoring and vulnerability assessment
- Beach nourishment and dune restoration techniques
- Hard and soft coastal protection methods
- Sustainable erosion control strategies
- Case Study: Gold Coast Beach Nourishment Project, Australia – Sustainable shoreline restoration

Module 4: Design of Coastal Structures

- Breakwaters, seawalls, groynes, and revetment design
- Offshore structure engineering principles
- Hydraulic stability and structural performance
- Material selection for marine environments
- Maintenance and lifecycle management
- Case Study: Port of Rotterdam Expansion – Advanced marine infrastructure development

Module 5: Coastal Climate Change Adaptation

- Sea-level rise impact assessment
- Climate-resilient coastal planning
- Extreme weather event management
- Disaster risk reduction frameworks
- Adaptation strategies for vulnerable coastlines
- Case Study: New York Harbor Resilience Program – Climate adaptation planning after Hurricane Sandy

Module 6: Numerical Modeling and Digital Coastal Engineering

- Introduction to coastal engineering software tools
- GIS applications in coastal analysis
- Remote sensing and satellite-based monitoring
- Digital twin technology for coastal systems
- Data-driven coastal management solutions
- Case Study: Singapore Coastal Protection Program – Digital monitoring and smart coastal planning

Module 7: Nature-Based Solutions and Sustainable Coastal Management

- Mangrove restoration and coastal ecosystems
- Living shorelines and ecosystem-based adaptation
- Blue carbon solutions
- Sustainable coastal development strategies
- Environmental impact assessment approaches

- Case Study: Mangrove Restoration Projects in Southeast Asia – Ecosystem-based coastal protection

Module 8: Integrated Coastal Zone Management and Future Trends

- Principles of integrated coastal zone management (ICZM)
- Stakeholder engagement and coastal governance
- Blue economy and sustainable marine development
- Smart coastal cities and resilient infrastructure
- Future innovations in coastal engineering
- Case Study: European Union Coastal Management Framework – Integrated coastal governance model

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

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