

1. Department, Course Number, Title

ORE 661 Coastal and Harbor Engineering

2. Designation as a Required or Elective Course

Required Course

3. Course Catalog Description

Planning and design of seawalls, groins, jetties, breakwaters, and layout of ports. Design requirements for harbor entrances and channels. Littoral drift and sedimentation problems. Navigation and mooring requirements. Pre: 607 or consent.

4. Prerequisites

Applied mechanics
Engineering economics
Fluid mechanics
Hydraulics
Probability and Statistics
Soil Mechanics
Wave mechanics

5. Textbooks and/or Other Reading Material

Textbook: None

Reference books:

1. Coastal Engineering Manual – Part II, US Army Corps of Engineers, 2006 (PDF version on <http://chl.erdc.usace.army.mil>).
2. NAVFAC DM 26.1, 26.2, and 26.3
3. Handbook of Coastal and Ocean Engineering, Vol. I, II, and III, Edited by John Herbich, Gulf Publishing Company, 1990.
4. Port Engineering, Vol. I and II, Edited by Per Bruun, Gulf Publishing Company, 1990.
5. Design of Marine Facilities for the Berthing, Mooring, and Repair of Vessels, J.W. Gaythwaite, ASCE Press, 2004.

6. ABET Course Learning Outcomes

The course familiarizes students with the planning, design, and maintenance of coastal and harbor structures. Specific learning outcomes include:

1. Ability to identify, formulate, and solve coastal and harbor engineering problems
2. Ability to provide optimal designs of coastal structures and harbor facilities
3. Appreciation of professional and non-technical issues

7. Topics Covered

1. Planning and Design. Problem definition, site characterization and data, alternative evaluation.
2. Breakwaters. Rubble mound structures (conventional and berm design), caissons, scour protection, and geotechnical consideration.

3. Revetments and Seawalls. Rubble mound structures, caissons, lateral earth pressure, seismic consideration.
4. Harbor. Navigational requirements, channels and turning basins, sedimentation and maintenance dredging.
5. Engineering practice issues. Design process, economics, construction, and risk.

8. Schedule

Two 1.25-hour sessions per week.

9. Contribution of Course to Meeting the Requirements of Criterion 5

Assessment

3 design projects (90%)

Class participation (10%)

Usage of Engineering Tools and Computers

Automated Coastal Engineering System (ACES), Coastal Engineering Manual (CEM), Excel, Matlab, Navy Standard Ship Motion (SMP) program.

Contribution to Professional Component

Engineering Science: 1 credit

Engineering Design: 2 credits

10. Relationship to Program Outcomes

Program Outcome 2: Basic science, mathematics, & engineering

Program Outcome 4: Ocean engineering specialization

Program Outcome 5: Use of latest tools in ocean engineering

Program Outcome 6: Problem formulation & solution

Program Outcome 7: Design & optimization in ocean engineering

Program Outcome 9: Professional issues

11. Prepared by

K.F. Cheung, Spring 2009