

2014-2016 EDUCATIONAL SKILL REQUIREMENTS  
Ocean Engineering  
1103 Subspecialty  
472 Curriculum

1. Curriculum Number: 472 (Ocean Engineering)
2. Curriculum taught at Civilian Institutions: California at San Diego, Florida Atlantic, Hawaii, New Hampshire, Oregon State, Rhode Island, Texas A&M
3. Students are Fully Funded.
4. Curriculum Length in Months: 15-18 Months
5. APC Required: N/A
6. Community Managers have agreed to allow billets to be coded for Facilities Engineering/1101 and officers to be educated for this curriculum.

Designator	Officer Community Manager	Approval Date
5100	CDR Jason Wood	1 Aug 2014

7. The officer must understand the fundamental concepts and be familiar with the basic functional areas of Ocean Engineering within the Department of the Navy (DON) and the Department of Defense (DOD) including:

a. Ability to measure and apply the environmental loading effects of wind, currents, waves, and, if available, seismic activity to the design of flexible and rigid structures. **(Structure Design)**

b. Working knowledge of seafloor sediment and rock, including types and properties, sampling and testing, and ability to use this knowledge to determine facility foundation and anchoring requirements. **(Ocean Geotechnical Design)**

c. Understanding of the types of marine materials, their engineering properties, principles of corrosion, and the techniques of cathodic protection for ocean facilities. **(Marine Material Design)**

d. Working knowledge of physical oceanography, including a thorough understanding of seawater properties, currents, tides, and meteorological conditions, and ability to predict operational and extreme environmental conditions through the application of advanced probability analysis of wave spectra and classical wave theories. **(Physical Oceanography)**

e. Basic knowledge of water wave theory, the properties of ocean surface waves and the effects of ocean waves on fixed and floating ocean structures. **(Ocean Wave Mechanics)**

f. Understanding of coastal processes, storm surge, tides, and other physical factors that affect the static and dynamic coastal geomorphology and sediment transport. Ability to determine the effects on structures, shorelines, and harbors. **(Coastal Engineering)**

g. Understanding of hydrodynamics including fluid flow behavior, resistance determination, and modeling of facility behavior under scaled conditions. **(Hydrodynamics)**

h. Basic knowledge of ocean construction practices including methods and limitations of working in the offshore environment on fixed and floating facilities, pipelines, cables, and mooring systems. **(Ocean Construction)**

i. Basic knowledge of the principles of naval architecture including but not limited to hydrostatics, ship stability and operability, materials, fluid dynamics and propulsion. **(Naval Architecture)**

j. Working knowledge of design methodologies for ocean structures, including finite element and difference models, modal analysis, and general quasi-static analysis. Application of the principles of fatigue and fracture mechanics to the design of ocean facilities. **(Numerical Modeling)**

k. Basic knowledge of project and program management, and systems engineering. **(Project Management)**

l. Basic understanding of data processing and computer techniques for application to engineering problems. **(Data Processing)**

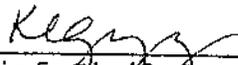
m. Proficiency in oral and written communications and ability to identify, research, and recommend alternatives to

various engineering problems for presentation to both technical and non-technical managers. (Communication)

n. Knowledge of problems meeting the growing energy demand. Selection of energy sources and their corresponding advantages and disadvantages. (Energy Demand and Sources)

o. A thesis or major report is required for the degree. The topic selected must be applicable to the type of ocean engineering problems typically found in the Navy, or extends knowledge in a particular technical engineering area. POC for coordination of thesis topic is Deputy OFP Director, (202) 433-5596. (Thesis/Project)

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APPROVED  7/21/15  
Chief Civil Engineers (NAVFAC) (DATE)

APPROVED  AUG 28 2015  
President, Naval Postgraduate School (DATE)

APPROVED  10/13/2015  
Director, TFMTEO (OPNAV N12) (DATE)