

2020 - 2022 Educational Skill Requirements
Oceanography Operational Sciences
Subspecialty Code 6402P
Curriculum 375

1. Curriculum Number: 375
2. Curriculum taught at Massachusetts Institute of Technology/Woods Hole Oceanographic Institution (MIT/WHOI)
3. Curriculum Length in months: 27
4. GRE is required. MIT admissions board criteria applies for the MIT-WHOI Joint Program.
5. The officer must understand the fundamental concepts and be familiar with the basic functional areas of Oceanography Operational Sciences within the Department of the Navy and the Department of Defense including:
 - a. ESR-1. Mathematics: The officer will master the mathematical principles and techniques necessary to complete graduate level course work and research related to physical oceanography and ocean engineering.
 - b. ESR-2. Physical Oceanography: The officer will understand the oceanographic principles and processes influencing ocean circulation, mesoscale weather, waves and turbulence. This includes unique characteristics of various regions such as polar, mid-latitude and coastal areas.
 - b. ESR-3. Sensing: The officer must be able to observe, assimilate, analyze, and predict tactical, synoptic, and coastal meteorological and oceanographic conditions using direct and remote sensing observation techniques. This understanding should include the basic principles of design and operation of autonomous unmanned vehicles, as well as operator manned, fixed remote, and satellite systems.
 - c. ESR-4. Dynamics: The officer will have a sound understanding of polar, mid-latitude, tropical, and coastal oceanographic dynamics, at the meso and synoptic scales. The officer will be able to articulate the impact of these regions' conditions on military operations and systems.
 - d. ESR-5. Acoustics. The officer will understand acoustical phenomena affecting propagation of sound in the ocean environment, including aspects of acoustic variability and uncertainty. The officer will be able to articulate the impact of these conditions on systems and platforms and provide recommendations for employment of assets on military operations.
 - e. ESR-6. Prediction: The officer will have a thorough understanding of numerical prediction systems as it applies to the physics and dynamics of the ocean and acoustics. This understanding should include a broad understanding of the modeling systems to include strengths, weaknesses, and vulnerabilities; the state of current models and techniques; and appropriate applications of deterministic and stochastic techniques.

f. ESR-7. Problem Solving and Practical Applicability: The officer will develop critical thinking skills and conduct independent analyses to solve environmentally challenging problems in the field of Physical Oceanography as it applies to Naval/Joint operations, using modern scientific research techniques, field experience, tools and equipment. This will include understanding of the theory and design principles of tactical decision aids used in fleet operations.

6. Major Area Sponsor and Subject Matter Experts:

22 March /
DATE

25 July 2021
DATE

8 DEC 21
DATE

Enclosure (3)