



## Course Description

**College/Institute: Maritime Postgraduate Studies Institute**

**Program: M.Sc in Hydrographic Surveying**

1- Course Data		
<b>Course Code: MPI 756</b>	Physical Oceanography	<b>Academic Year:2015-2016</b>
<b>Specialization:</b>	Hydrographic Surveying	

<b>2- Course Aim</b>	<p>This course provides the basic knowledge of sea water properties and the main oceanic processes. Understanding the physics of ocean phenomena such as: tides, waves, currents, and oceanic circulation is essential background to assist the student to deal with the ocean's complex media in regard with hydrographic surveying and seamanship.</p>
3- Intended Learning Outcome:	
<b>a- Knowledge and Understanding, students will be able to:</b>	<ol style="list-style-type: none"> <li>1. Understand the basic knowledge of seawater properties and the main oceanic processes.</li> <li>2. Understand the physics of ocean phenomena such as: tides, waves, currents, and oceanic circulation</li> <li>3. to deal with the ocean's complex media in regard to hydrographic surveying and seamanship.</li> <li>4. Identify the main features of sea floor of the oceans.</li> <li>5. Discuss the hydrographic properties of water column in regard with salinity and temperature.</li> <li>6. Describe the global-wind system and the associated oceanic currents.</li> </ol>
<b>b- Intellectual Skills, students will be able to:</b>	Identify and critically analyze issues involved in science of Physical Oceanography and other branches and applications of the Physical Oceanography
<b>c- Professional Skills, students will be able to:</b>	<ol style="list-style-type: none"> <li>1. Apply efficiently theories of tides, tidal types, harmonic tidal constituents, tidal prediction, measuring tides, tidal currents and practice tidal elevations using software packages.</li> <li>2. Determine and considering acoustic and optic</li> </ol>



	<p>properties of the seawater,</p> <ol style="list-style-type: none"> <li>3. Practice software in analyzing and exchanging oceanographic data.</li> <li>4. Explain wind-driven currents, Ekman spiral and Ekman depth.</li> <li>5. Classify wave types: sea and swell, storm surges, tsunami, shallow water waves and learn methods of wave measurements.</li> </ol>
<p><b>d- General Skills, students will be able to:</b></p>	<ol style="list-style-type: none"> <li>1. Ocean Circulation: Wind-driven current (Ekman Current)., Density current, and Principal Oceanic Currents and general atmospheric circulation.</li> <li>2. Tides and Tidal currents: Types of tides, Tide generating forces, spring and neap tides, tidal harmonic constituents, Tidal currents, and tidal datum and tidal records.</li> <li>3. Ocean Waves: <ul style="list-style-type: none"> <li>- Wind waves, generation and growth.</li> <li>- Wave mechanics</li> <li>- Types of waves: (Capillary, Gravity, Seiches, Storm Surge, Internal, Tsunami, Tides).</li> <li>- Wave measurements.</li> <li>- Waves and ships.</li> </ul> </li> <li>4. Coastal Oceanography: <ul style="list-style-type: none"> <li>- Wave breaking and surf.</li> <li>- Wave transformation and energy dissipation.</li> <li>- Estuarine Environment.</li> </ul> </li> <li>5. Sound and Optics in the Sea: <ul style="list-style-type: none"> <li>- Acoustic properties.</li> <li>- Optic properties.</li> </ul> </li> </ol>
<p><b>4- Course Content</b></p>	<p><b>WEEK (1) The Oceans:</b> Features of Sea Floor: (Continental shelf, continental slope, ridges, seamounts, submarine canyons).</p> <p><b>WEEK (2) Physical properties of sea water:</b> (salinity, temperature, pressure, density, ..).</p> <p><b>WEEK (3) Ocean Circulation:</b> Wind-driven current (Ekman Current).</p> <p><b>WEEK (4) Density current.</b></p> <p><b>WEEK (5) Principal Oceanic Currents and general atmospheric circulation.</b></p> <p><b>WEEK (6) Tides and Tidal currents:</b></p>



	<p>-Types of tides.</p> <p>-Tide generating forces, spring and neap tides.</p> <p>-Tidal harmonic constituents.</p> <p><b>WEEK (7) Evaluation</b> 7 th week</p> <p><b>WEEK (8) Tidal currents:</b> Tidal datum and tidal records.</p> <p><b>WEEK (9) Ocean Waves:</b> Wind waves, generation and growth.</p> <p><b>WEEK (10) Wave mechanics:</b> Types of waves: (Capillary, Gravity, Seiches, Storm Surge, Internal, Tsunami, Tides).</p> <p><b>WEEK (11) Wave measurements, Waves and ships</b></p> <p><b>WEEK (12)</b> 12th week exam.</p> <p><b>WEEK (13) Coastal Oceanography:</b> Wave breaking and surf, Wave transformation and energy dissipation. Estuarine Environment.</p> <p><b>WEEK (14) Sound and Optics in the Sea:</b> Acoustic properties and Optic properties.</p> <p><b>WEEK (15) Research presentation</b></p> <p><b>WEEK (1) Final exam</b></p>
<b>5- Teaching and Learning Methods</b>	A mixture of lectures, tutorials, exercises, and case studies are used to deliver the various topics in this subject, some of which are covered in a problem-based format, thereby enhancing the learning objectives by using Office hours and Additional Follow up.
<b>6- Teaching and Learning Methods for Students with Special Needs</b>	
<b>7- Student Assessment:</b>	<ol style="list-style-type: none"> <li>1.Participation</li> <li>2.Assignments</li> <li>3.Presentations</li> <li>4.Case Study</li> <li>5.Quiz</li> </ol>



	6. Written Exams 7. Workshop
<b>a- Procedures used:</b>	
<b>b- Schedule:</b>	Assessment(1) Mid Assessment(2) 12 <sup>th</sup> Assessment(3) 15 <sup>th</sup> .
<b>c- Weighing of Assessment:</b>	7 <sup>th</sup> Week Examination , 12 <sup>th</sup> Week Examination , Final-term Report Writing , Oral seminar exam , Practical Examination , Semester Work , Total 100%
<b>8- List of References:</b>	Apel J.R. 1987. Principles of Ocean Physics. New York: Academic Press.
<b>a- Course Notes</b>	
<b>b- Required Books (Textbooks)</b>	
<b>c- Recommended Books</b>	Baker D.J. 1981. Ocean instruments and experiment design. In Evolution of Physical Oceanography: Scientific Surveys in Honor of Henry Stommel. Edited by B. A. Warren and C. Wunsch. 396–433. Cambridge: Massachusetts Institute of Technology Press.
<b>d- Periodicals, Web Sites, ..., etc.</b>	

**Vice Dean for Educational Affairs**  
**Affairs Name & Signature:**  
**Date:**

**College/Institute Dean**  
**Name & Signature:**  
**Date:**