Course Syllabus

MARINE WAVES

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Program: Oceanographic Engineering

1. Course number and name

OCEG1006 - MARINE WAVES

2. Credits and contact hours

3 credits and 3 contact hours

3. Instructor's course or coordinator's name

JONATHAN MARCELO CEDEÑO OVIEDO

4. Text book, tittle, author, and year

• Holthuijsen, Leo H.. Waves in oceanic and coastal waters (1st Edition)

a.Other supplemental materials

• Sorensen, Robert M.. Basic Coastal Engineering (3rd Edition)

• U.S. Coastal Engineering Research Center. Shore Protection Manual (SPM) (4th Edition)

5. Specific course information

a. Brief description of the content of the course (catalog description)

This course studies the wave phenomena of the ocean, which include capillary waves, seiches, tsunamis and tides, with special emphasis on the wind-generated waves whose restoration force is gravity. This approach is complemented by the analysis of the local wave regime, as well as the exploration of practical applications of wave mechanics, including wave prediction and forecasting.

b. Prerequisites

PHYSICAL OCEANOGRAPHY - OCEG1003

c. This course is: Required

6. Specific goals for the course

a. Specific outcomes of instruction

1.- Identify the main wave phenomena of the ocean based on the study of its energy spectrum.

2.- Solve the Laplace equation using the method of separation of variables with edge conditions, for the determination of the kinematic and dynamic properties of the waves.

3.- Apply data analysis techniques to determine the spectrum of a wave record, as well as the tidal harmonics of a sea level time series

4.- Integrate the knowledge of wave mechanics for the description of extreme events and their impact on the activities of the marine-coastal environment

b. Explicity indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course

• An ability to function effectively on a team whose members together provide

leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

• An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

7. Brief list of topics to be covered

1.- Linear wave theory

2.- Kinematics and wave dynamics.

3.- Wave spectrum

4.- Tides