COURSE DETAIL

OSCILLATION PHENOMENA

Country
Japan

Host Institution
Tohoku University

Program(s)
Engineering and Science

UCEAP Course Level
Lower Division

UCEAP Subject Area(s)
Physics

UCEAP Course Number
70

UCEAP Course Suffix

UCEAP Official Title
OSCILLATION PHENOMENA

UCEAP Transcript Title
OSCILLATN PHENOMENA

UCEAP Quarter Units
3.00

UCEAP Semester Units
2.00

Course Description

Oscillatory motions and waves are prevalent in natural phenomena. They appear in many physical systems of various materials and scales. The first half of this course explores the properties of simple harmonic motion and a wave equation that describes waves on a string and sound waves. The second half of the course applies Newtonian mechanics to a system of many particles. The course begins an investigation from a rigid body and then relax this condition slightly. Finally, the course studies a system of particles with many degrees of freedom, namely fluid.

By the end of the course, students are expected to gain familiarity with and understand oscillation phenomena, which include the simple motion of a pendulum and the propagation of waves and their basic properties. Also, students will have acquired knowledge of the basic properties of wave equations and their solutions. The mechanism behind the standing waves, sound waves, beats, the Doppler effect, and shock waves should become clear. Students are also expected to be able to solve the mechanics of static equilibrium for various configurations, including that in fluid with buoyancy. Young's modulus and bulk modulus as a determining factor of wave speed in medium should be clear. Familiarity with a general form of the hydrodynamical equation of motion from which hydrostatic and Bernoulli's equations are obtained under special conditions is also expected.

Language(s) of Instruction
English

Host Institution Course Number
N/A

Host Institution Course Title
PHYSICS B

Host Institution Campus
Tohoku University

Host Institution Faculty

Host Institution Degree

Host Institution Department
College-wide

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