

Course Syllabus

VECTOR MECHANICS

Printed by: jcedeno

Program: Oceanographic Engineering

1. Course number and name

MECG1001 - VECTOR MECHANICS

2. Credits and contact hours

3 credits and 4 contact hours

3. Instructor's course or coordinator's name

EFRAIN ANDRES TERAN CALLE

4. Text book, tittle, author, and year

- Berr Johnston. Mecánica vectorial para ingenieros: estática (Décima edición, 2010)
 - a. Other supplemental materials
- Ferdinand P. Beer, E. Russell Johnston y Phillip J. Cornwell. MECANICA VECTORIAL PARA INGENIEROS: DINAMICA (Décima edición)
 - R.C. Hibbeler. Ingeniería Mecánica Estática, para cursos con enfoque por competencias (Primera Edición)
 - R.C Hibbeler. Ingeniería mecánica, Dinámica (eBook) (Catorce Edición)

5. Specific course information

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

This professional training course uses classical mechanics as a foundation for engineering design. The Vector Mechanics course describes the behavior of rigid bodies under the action of forces. In the first part of the course, Newton's laws are used to determine the static equilibrium of structures, machines, beams and cables. The concepts of concentrated force, moment of force, distributed loads and friction are applied in the solution of engineering problems. In the second part of the course, the motion of particles and rigid bodies under the action of external forces that produce acceleration is analyzed. Finally, alternative methods of energy and momentum are presented for the solution of particular cases.

- b. Co - Requisites

FLUID MECHANICS I - MECG1005

- c. This course is: Required

6. Specific goals for the course

- a. Specific outcomes of instruction

1.- Apply criteria of static and dynamic equilibrium in particles and rigid bodies for the solution of engineering problems.

2.- Analyze internal forces in beams, cables and structural elements using free-body diagrams and equilibrium conditions.



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3.- Analyze dynamic problems in rigid bodies using Newton's second law, the principle of work and energy, and the principle of momentum.

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

- An ability to apply Mathematics, including Multivariate Calculus and Differential Equations, and Basic and Engineering Sciences to model and solve mechanical engineering problems.

- An ability to identify, formulate, and solve naval engineering problems

7. Brief list of topics to be covered

- 1.- Static equilibrium of rigid bodies
- 2.- Structure analysis
- 3.- Forces on beams and cables
- 4.- Kinematics of particles and rigid bodies
- 5.- Kinetics of particles and rigid bodies
- 6.- Energy and momentum methods for rigid bodies