FACULTY OF **ENGINEERING**

DEGREE COURSE: **CIVIL AND ENVIRONMENTAL ENGINEERING BS**

SUBJECT: ANALYTICAL MECHANICS

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OBJECTIVES

The aim of this course is the acquisition of mathematical methods and models useful to the of study the mechanics (statics and dynamics) of systems of rigid bodies.

CONTENTS

Vectors, matrices and basic operations
Position, velocity and acceleration
Kinematics of the rigid body (and systems of rigid bodies)
Momentum and Angular Momentum
Force, Work, Power
Potential Energy and Kinetic Energy
Dynamics of the rigid body (and systems of rigid bodies)
Statics of the rigid body (and systems of rigid bodies)
Introduction to Lagrangian and Hamiltonian mechanics

LEARNING OUTCOMES

The student will acquire the basis for the mathematical modeling of mechanical systems and the related methods of qualitative and quantitative analysis.

ASSESSMENT

Written exam: multiple choice and open questions

RECOMMENDED TEXTBOOKS

The course is self-contained and the student can refer to the teaching material provided by the professor.
Additional exercises may be found in the following books:
- Nelson, Best, McLean, Potter - Schaum's Outline of Engineering Mechanics: Statics
- Nelson, Best, McLean, Potter - Schaum's Outline of Engineering Mechanics: Dynamics