Code	ING212 / ING207	Prerequisites	ING-205
Name	Dynamics	Co-requisites	ING-212L

Credits	Contact Hours
04	40
Categorization of credits	
Math and basic science	
Engineering topic	X
Other	

Coordinator's name	Eng. Javier Christopher, MAG Kalil Erazo, PhD Oscar Suncar, PhD

Text book
Other supplemental materials
Beer, F. Johnston, E. (2013) Vector Mechanics for Engineers: Dynamics. (10th edition). McGraw-Hill. Pytel, A., Kiusalaas, J. (2012) Mechanical Engineering. (3rd edition). Thomson Publishing House. Boresi, A.P., Schmidt, R.J. (2001). Mechanical Engineering. Thomson Publishing House Hibbeler, R.C. (2010). Mechanical Engineering: Dynamics. Editorial Prentice Hall Das, B., Kassimali, A., Sami, S. (1999). Mechanics for engineers: Dynamics. Editorial Limusa.

Description	
Through this subject, it deepens and gives continuity to topics introduced in the Basic Sciences module. With a less instructive approach and more directed to the development of student problem solving skills. It works with the topics of particle straight and curvilinear motion, kinetics, work and energy, momentum and amount of motion, rigid solids dynamics and vibrations.	
Type of course	Required ☒ Elective ☐

Specific goals for the course	
Outcomes of instruction	EG1.1 Identifies the forces acting on a system to make its free body diagram.

	EG1.2 Identifies the conservative and non-conservative forces acting in a dynamic system. EG1.3 Writes Newton and Euler equations of motion to analyze the dynamic behavior of particles and rigid bodies. EG1.4 Describes the trajectory of dynamic system movement within the context of specific situations. EG1.5 Categorizes forced and unforced vibrations according to the forces acting. EG1.6 Identifies the concept of Damped and Undamped Vibrations as a function of the relevant forces. EG2.1 Interprets properly the results obtained from the equations corresponding to the problems. EG3.1 Demonstrates the use of different learning and assimilation strategies in the course of the course, evidenced by their observations
Student outcomes	CG1 Identifies, formulates, and solves complex Engineering problems by applying the principles of Engineering, Science, and Mathematics. CG2 Develops and conducts appropriate experimentation, analyzes and interprets data, and uses engineering criteria to draw conclusions. CG3 Acquires and applies new knowledge using appropriate learning strategies.

Topics
Unit I. Introduction Unit II. Particle kinematics: rectangular coordinates Unit III. Particle Kinematics: Tangential Normal System Unit IV. Particle Kinematics: Radial-Transverse System V. Kinetic Unit Unit VI. Work and energy Unit VII. Power Unit VIII. Impulse and amount of movement. Impact Unit IX. Rigid Body Dynamics X. Vibration Mechanics