

PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE  
COLLEGE OF ENGINEERING  
DEPARTMENT OF MECHANICAL AND METALLURGICAL ENGINEERING  
ABET COURSE SYLLABI

**ICM2132 ASTRONAUTICS**

**Credits and contact hours:** 10 credits // 10 hours (3 hours in lectures and 7 individual work hours per week)

**Instructor's name:** Cristian Chavez

**Course coordinator's name** Cristian Chavez

**Textbook:** Bate, R.; Mueller, D. & White, J. Fundamentals of Astrodynamics. Dover Publications, 1971.

**Course Catalog Description:** This unit deepens into the fundamentals of Astronautics presented in the previous course. The architecture of the mission defined in four areas (spacecraft design, orbit, launch vehicle and mission operations systems) is detailed at a level enough deep in order to design an astronomical project of medium complexity, according to the Chilean reality of satellite acquisition and operations. Throughout the course students will learn analytical, numerical and simulation tools in order to solve the challenges this technological discipline demands.

**Prerequisite Courses:** ICM2122 Introduction to Astronautics

**Co-requisite Courses:** None

**Status in the Curriculum:** Elective

**Course Learning Outcomes:**

1. Distinguishing and explaining the natural and engineering factors present in a medium complexity astronomical project.
2. Becoming aware of the need to design astronomical projects according to the four elements of the mission architecture (spacecraft design, orbit, and launch vehicle and mission operations systems).
3. Distinguishing and applying the essential concepts of the Astronautical Engineering.

**Relation of Course to ABET Criteria:**

- b. Design and conduct experiments: analyze and interpret data
- c. Design a system, component, or process
- e. Identify, formulate, and solve engineering problems
- f. Professional and ethical responsibility
- g. Effective communication
- i. Recognition of the need for, and an ability to engage in life-long learning
- j. Knowledge of contemporary issues

**Topics covered:**

1. Astronautical mission design
2. Spacecraft and payload
3. Orbits and trajectories
4. Launch vehicles