- **Course Number and Title:** A E 405. Special Topics: Spacecraft Dynamics and Control
- **Catalog Description:** The course provides basic principles, theory, and applications in spacecraft dynamics and control.
- **Credit Hours:** 3 Credits (3)
- **Prerequisite(s) / Corequisite(s)** Prerequisite(s): A E 362 or Consent of Instructor
  Corequisite(s): None
- **Required:** Elective for BSAE Degree
- **Course Availability:** N/A
- **Instructor (Usual):** N/A
- **Textbook:**
  1) H. Curtis, *Orbital Mechanics for Engineering Students*, 3rd edition, 2014
  2) B. Wie, *Space Vehicle Dynamics and Control*, AIAA Education Series, 1998
  3) H. Schaub and J. Junkins, *Analytical Mechanics of Space Systems*, AIAA Education Series, 2003
- **Course Learning Objectives:** <u>After completing this course, a student should be able to:</u>
- **Topics Covered:**
  - [Part 1] Attitude dynamics and control of spacecraft including direction cosine matrix, Euler angles, Euler parameters, torque-free attitude dynamics, stability of rigid body rotations, and attitude feedback control laws.
  - [Part 2] Orbital dynamics and control of spacecraft including perturbations and stability, on-orbit maneuvers, relative motion, and interplanetary trajectories.