MECH 4395
Space Craft Dynamics and Controls
Summer 2018 Syllabus

Instructor: Dr. Angel Flores-Abad.

Class Time and Location: M-F, W 1:30 pm - 6:30 pm, Bell Hall 130A.

Office: E331

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Office hours: Wednesday, 9:00-11:00 AM, or by appointment.

Course Objectives: To obtain the fundamentals on spacecraft dynamics and control considering the effects of orbital mechanics. Particular focus is placed on rigid body kinematics and dynamics, attitude control, orbital determination and orbital maneuvers.

Contents:

- Dynamics Systems Modelling
- Rotational kinematics
- Dynamics Systems and Controls
- Orbital Dynamics
- Orbital Maneuvers and Controls
- Rigid-body Dynamics
- Rotational Maneuvers and Controls

Reference Textbooks:

[1] Space Vehicle Dynamics and Control, AIAA Education 2nd Edition, by Bong Wie.
[2] Space Vehicle Guidance, Control, and Astrodynamics by Bong Wie.
[3] Analytical Mechanics of Space Systems, by H. Schaub and J. Junkins.
[4] Orbital Mechanics for Engineering Students, 2nd Edition by Howard Curtis.

Software: Matlab, Simulink, Simmechanics, STK.

Course Overview – Individual lectures will be provided and assignments will reinforce the concepts. Simulation and experimental projects will be used at the end of each chapter.

Grading – The final grade will be calculated as follows:

Exams (2) 40%
Assignments and Projects 60%