

**AA528**  
**Spacecraft Dynamics and Control**  
**Department of Aeronautics & Astronautics**  
**Winter 2017; Syllabus<sup>1</sup>**

**Instructor:** Mehran Mesbahi  
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<http://faculty.washington.edu/mesbahi/>

**Instructor's Office Hours:** Tuesdays: 1:00pm-4pm (Guggenheim Hall 318E)

**Class website:** Please see: <http://faculty.washington.edu/mesbahi/> under "teaching"

**Class Room:** Loew 216

**Class Time:** Tuesdays,Thursdays: 10:00 am-11:20 am

**Textbook:** *Spacecraft Dynamics and Control: An Introduction*, A. H. de Ruiter, C. Damaren, J. R. Forbes, Wiley, 2013 (required).

**Other useful references:**

*Atmospheric And Space Flight Dynamics: Modeling and Simulation with Matlab And Simulink*, A. Tewari, Birkäuser, 2007.

*Space Vehicle Dynamics and Control*, B. Wie, AIAA, 2008.

*Fundamentals of Astrodynamics*, R. R. Bate, D. D. Mueller, and J. E. White, Dover, 1971.

*Orbital Mechanics for Engineering Students*, H. Curtis, Butterworth-Heinemann, 2005.

*Space Mission Analysis and Design*, W. Larson and J. Wertz (Editors), Microcosm Press and Kluwer, 1999.

*Spaceflight Dynamics*, W. E. Wiesel, McGraw-Hill, 1989.

*Spacecraft Attitude Dynamics*, P. C. Hughes, Dover, 2004.

**Handouts:** I will provide hand-outs or post papers/notes on the class website.

**Topics:** The topics discussed in class include: rigid body kinematics and dynamics, orbital mechanics, attitude dynamics and control, attitude determination, formation flight, three body problem, Hill's theory, and related topics.

The class website will be updated frequently. **Check it regularly.** I will post homework assignments, thoughts, notes, references, etc., on it.

**Homework:** We will have weekly homework assignments (there a few weeks that we will skip); the homework will be assigned on Tuesdays and due the following week's Wednesdays at 11:45 pm in the dropbox address

<https://catalyst.uw.edu/collectit/dropbox/mesbahi/39463>

The contribution of the homework toward your class grade is 20%.

**Discussion Board:** We will use the catalyst GoPost

<https://catalyst.uw.edu/gopost/board/mesbahi/43623/>

for class discussion. Please use GoPost for all homework and general class questions/discussions and feel free to contribute to it!

**Midterm:** We will have one midterm that contributes 40% to your class grade. The date of the midterm is currently set for February 14th, 2017.

**Project:** We will also have a project for the course; it will contribute 40% to your class grade. We will talk more about the project's scope and format.

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<sup>1</sup>version 0.1; January 3, 2017