

M.S. Program of Study for Spacecraft Dynamics and Control

“The area of dynamics includes the study of vehicle dynamics, stability, and trajectories in the space, atmosphere, and ocean environments. The area of control includes the study of modern control theory and applications to the guidance and control of vehicles.”

Advisory Committee

- Three members, at least two on the AOE faculty
- Advisor (Chairman) must be a member of the resident Virginia Tech faculty, but is not required to be a member of the AOE Faculty

Plan of Study

- Prepare early in 2nd semester
- Approved by Advisor, Advisory Committee, Department Graduate Committee Chairman, Department Head, and Dean of the Graduate School

Course Requirements

- ≥ 30 hours **required** with up to 10 for thesis credit (AOE 5994)
- ≥ 12 hours **required** >5000-level (excludes 5994)
- ≤ 5 hours of 4984, 5974, and 5984 allowed
- ≤ 12 hours of 4000 level course allowed
- **Required** courses for all AE M.S. (12 credits)
 - AOE 5104 Advanced Aero and Hydrodynamics (Fall)
 - AOE 5024 Vehicle Structures (Fall)
 - AOE 5204 Vehicle Dynamics and Control (Fall)
 - AOE 4404 Applied Numerical Methods (Spring)
- **Required** courses for all AE D&C M.S.
 - 9 credits of approved technical electives
 - Note that AOE 5244 Optimization Techniques (Fall) and AOE 5224 Linear Optimal Control Systems (Spring) are required for D&C Ph.D. candidates – these requirements are subject to change
- **Summary:** 12 credits specified + 9 credits electives + 10 credits thesis = 31 > 30

Recommended Technical Electives for a Space-Flavored Degree

AOE 4140	Spacecraft Attitude Dynamics and Control (Spring)
AOE 4174	Space Propulsion (Spring, new in 2001)
AOE 5034	Vehicle Structural Dynamics (Spring)
AOE 5224	Linear Optimal Control Systems
AOE 5344	Nonlinear Control
AOE 5234	Orbital Mechanics (Spring odd-numbered years)
AOE 6234	Spaceflight Dynamics (Spring even-numbered years)
ECPE 4164	Intro to GPS Theory/Design (Fall)
ECPE 4644	Satellite Communications (Spring)
ESM 5754	Intro to Perturbation Methods (Fall)
ESM 5314	Intermediate Dynamics (Spring) [this can substitute for AOE 5234 Orbital Mechanics, a Ph.D. required course usually offered every other year]
ESM 5414	Nonlinear Systems (Spring)
ESM 6314	Advanced Dynamics (Fall)

