



## Course list by areas:

Updated 4/19/2016

### AEROSPACE

#### **Fall Semester**

MAE 5420 Compressible Fluid Flow (MAE 2300)  
MAE 5500 Aerodynamics (MAE 3420)  
MAE 5560 Dynamics of Space Flight (MAE 3320)  
MAE 6180 Dynamics and Vibrations (MAE 5300 or 6130)  
MAE 6340 Spacecraft Attitude Control Theory (MAE 5310)  
MAE 6500 Potential Flow\* (MAE 5500)  
MAE 6510 Aircraft Dynamics and Flight Simulation (MAE 5510)  
MAE 6530 Advanced Propulsion Systems (MAE 5540)  
MAE 6540 Advanced Astrodynamics\* (MAE 5560)  
MAE 7540 Advanced Applied Astrodynamics\* (MAE 5560)  
ECE 5230 Spacecraft Systems Engineering (MATH 2270, 2280)  
ECE 6240 Space Environment and Engineering (ECE 5230)

#### **Spring Semester**

MAE 5440 Computational Fluid Dynamics (MAE 3420, 3440)  
MAE 5510 Dynamics of Atmospheric Flight (MAE 5500)  
MAE 5540 Propulsion Systems (MAE 5420)  
MAE 6345 Spacecraft Attitude Control Application (MAE 6340)  
MAE 6440 Advanced CFD (MAE 5440, 6410)  
MAE 6490 Turbulence (MAE 6410)  
MAE 6550 Advanced Structural Analysis\* (MAE 6040)  
MAE 6560 Spacecraft Navigation (MAE 5310)  
MAE 7340 Advanced Aerospace Controls (MAE 6320)

#### **Summer Semester**

MAE 6570 Optimal Spacecraft Guidance\* (MATH 2210, 2250)  
MAE 7560 Optimal Estimation for Aerospace Sys\* (MAE 5310)  
MAE 7570 Monte Carlo/Linear Covariance\* (MAE 6560)

### DYNAMICS & CONTROL

#### **Fall Semester**

MAE 5310 Dynamic Systems and Controls (MAE 3340)  
MAE 5560 Dynamics of Space Flight (MAE 3320)  
MAE 6180 Dynamics and Vibrations (MAE 5300 or 6130)  
MAE 6320 Linear Multivariable Control (MAE 5310)  
MAE 6540 Advanced Astrodynamics\* (MAE 5560)  
MAE 7360 Optimal/Robust Control (MAE 6320)  
ECE 5230 Spacecraft Systems Engineering (MATH 2270, 2280)

#### **Spring Semester**

MAE 5320 Mechatronics ((MAE 5310)  
MAE 5510 Dynamics of Atmospheric Flight (MAE 5500)  
MAE 6340 Spacecraft Attitude Control (MAE 5310)  
MAE 7330 Nonlinear and Adaptive Control\* (MAE 6320)

#### **Summer Semester**

MAE 6570 Optimal Spacecraft Guidance\* (MATH 2210, 2250)

### SOLIDS

#### **Fall Semester**

MAE 5020 Finite Element Methods I (MAE 3040)  
MAE 5300 Vibrations (ENGR 2030, 2140)  
MAE 6040 Continuum Mech (MAE 3040, MATH 2210, 2250)  
MAE 6130 Structural Dynamics and Seismic Design  
MAE 6180 Dynamics and Vibrations (MAE 5300 or 6130)  
MAE 7080 Advanced Plate and Shell Theory\*

#### **Spring Semester**

MAE 5060 Mechanics of Composite Materials I (MAE 3040)  
MAE 5350 Kinematics (MAE 3320)  
MAE 5670 Fracture Mechanics (MAE 2160, 3040)  
MAE 6010 Finite Element Methods II (MAE 5020)  
MAE 6070 Mechanics of Composite II\* (MAE 5060)  
MAE 6090 Theory of Plates and Shells\* (MAE 3040)  
MAE 6550 Advanced Structural Analysis\* (MAE 6040)  
MAE 7040 Elasticity\* (MAE 6040)  
MAE 7050 Plasticity\* (MAE 6040 or CEE 6080)

### THERMAL/FLUID SCIENCE

#### **Fall Semester**

MAE 5420 Compressible Fluid Flow (MAE 2300)  
MAE 5450 Renewable Energy\* (MAE 3440)  
MAE 5500 Aerodynamics (MAE 3420)  
MAE 6410 Fluid Dynamics (MAE 3420 or CEE 3500)  
MAE 6420 Mechanical Engineering Experiments (MAE 3340)  
MAE 6450 Thermodynamics (MAE 3440)  
MAE 6460 Conduction Heat Transfer\* (MAE 3440)  
MAE 6480 Radiation Heat Transfer\* (MAE 3440)  
MAE 6500 Potential Flow\* (MAE 5500)  
MAE 6530 Advance Propulsion Systems (MAE 5540)

#### **Spring Semester**

MAE 5410 Design and Optimization of Thermal Sys (MAE 3440)  
MAE 5440 Computational Fluid Dynamics (MAE 3420, 3440)  
MAE 5540 Propulsion Systems (MAE 5420)  
MAE 6430 Boundary Layer/Conv Heat Trans\* (MAE 3440, 6410)  
MAE 6440 Advanced CFD (MAE 5440, 6410)  
MAE 6490 Turbulence (MAE 6410)  
MAE 6630 Transport Phenomena\* (MAE 3420, 3440)

**ALL SEMESTERS:** Independent study courses (5930/6930/7930) may not be listed on the checklist/Program of Study before the course syllabus is approved by the student's supervisory committee. (Policy approved 1/25/2010)

\* Not offered every year; check schedule or ask instructor

## Approved Mathematics Courses

#### **Fall Semester**

MATH 5410 Methods of Applied Mathematics  
MATH 5760 Stochastic Processes  
MATH 6410 Ordinary Differential Equations I  
ECE 6010 Stochastic Processes in Electronic Systems

#### **Spring Semester**

MATH 5270 Complex Variables  
MATH 5420 Partial Differential Equations  
MATH 5460 Intro to Theory/Appl of NonlinDynamical Sys  
MATH 6270 Complex Variables  
MATH 6420 Partial Differential Equations I  
MATH 6440 Ordinary Differential Equations II

#### **Spring Semester (cont.)**

MATH 6450 Partial Differential Equations II  
MATH 6470 Advanced Asymptotic Methods  
MATH 6610 Matrix Computations \*(Taught as needed)  
MATH 6620 Numerical Analysis  
MATH 6640 Optimization  
ECE 6030 Math Methods for Signals and Systems  
STAT 5200 Design of Experiments

#### **Summer Semester**

MAE 7560 Optimal Estimation for Aerospace Sys