

Astronautics

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Curriculum:

Core Courses

MAE 4060 – Introduction to Spaceflight Mechanics
MAE 5160 – Spacecraft Technology and Systems Architecture

Either or both of the following:

MAE 6720 – Celestial Mechanics
MAE 6060 – Spacecraft Attitude Dynamics, Estimation and Control (not offered 2019-20)

Specialization Courses

Spacecraft Dynamics, Guidance, Navigation, and Control

MAE 5150 - GPS: Theory and Design
MAE 6969 - Seminar in GPS and GNSS (not offered 2019-20)
MAE 5730 - Intermediate Dynamics
MAE 5780 - Feedback Control Systems
MAE 5790 - Nonlinear Dynamics and Chaos
MAE 6700 - Advanced Dynamics
MAE 6850 - Hamiltonian Dynamics (not offered 2019-20)
MAE 6760 - Model-Based Estimation (not offered 2019-20)
MAE 6770- Formal Methods for Robotics
MAE 6780 - Multivariable Control Theory
MAE 6810 - Methods of Applied Mathematics I
MAE 6820 - Methods of Applied Mathematics II (not offered 2019-20)
ECE 4110 - Random Signals in Communications and Signal Processing
ECE 4250 - Digital Signal Processing
ECE 5210 - Theory of Linear Systems
ECE 5555 - Stochastic Systems: Estimation and Control (not offered 2019-20)

Space robotics

MAE 5180 - Autonomous Mobile Robots
MAE 4758 - Robot Learning (not offered 2019-20)
MAE 7770 - Mechanics of Terrestrial Locomotion (not offered 2019-20)
ECE 4271 - Evolutionary Processes. Evolutionary Algorithms, Evolutionary Games
ECE 5470 - Computer Vision

Space Science

AEP 4400 - Quantum and Nonlinear Optics
AEP 6060 - Introduction to Plasma Physics
ASTRO 4410 - Experimental Astronomy
ASTRO 4431 - Physics of Stars, Neutron Stars and Black Holes
ASTRO 4432 - Intersellar Medium and Galaxy Evolution
ASTRO 4433 - Introduction to Cosmology
ASTRO 6509 - General Relativity I (not offered 2019-20)
ASTRO 6510 - General Relativity II (not offered 2019-20)
ASTRO 6523 - Data Mining and Machine Learning in Astrophysics (not offered 2019-20)
ASTRO 6560 - Theory of Stellar Structure and Evolution (not offered 2019-20)
ASTRO 6570 - Physics of the Planets
ASTRO 6577 - Planetary Surface Processes
ASTRO 6590 - Galaxies and the Universe
EAS 4260 - Structural Geology (not offered 2019-20)
EAS 4530 – Mineralogy (not offered 2019-20)
ECE 5810 - Introduction to Plasma Physics

Space-Based Earth Observation

CEE 4110 - Applied Remote Sensing and GIS for Resource Inventory and Analysis
CEE 6100 - Remote Sensing Fundamentals
EAS 4350 - Statistical Methods in Meteorology and Climatology (not offered 2019-20)
EAS 4800 - Our Changing Atmosphere: Global Change and Atmospheric Chemistry (not offered 2018-19)
EAS 4870 - Introduction to Radar Remote Sensing (not offered 2019-20)
EAS 5011 - Evolution of the Earth System
EAS 5840 - Inverse Methods in the Natural Sciences (not offered 2019-20)

Space Travel, Exploration, Commercialization, and Settlement

MAE 5910 - Model Based Systems Engineering
MAE 5920 - Systems Architecture, Behavior, and Optimization
MAE 5930 - Systems Engineering and Six Sigma for the Design and Operation of Reliable Systems
MAE 6640 - Mechanics of Bone (not offered 2018-19)
BME 4440 - Science Policy Bootcamp: Concept to Conclusion
BME 5390 - Biomedical Materials and Devices for Human Body Repair
MAE 6680 - Cancer for Engineers and Physicists
ARCH 4621 - Sustainable Architecture: The Science and Politics of Green Building
ARCH 5612 - Structural Concepts
ARCH 5613 - Structural Systems
ARCH 5611 - Environmental Systems I: Site and Sustainability
ARCH 5616 - Environmental Systems II: Building Dynamics
CEE 4510 - Microbiology for Environmental Engineering
CEE 6910 - Principles of Project Leadership
EAS 4790 - Paleobiology
NBA 5070 - Entrepreneurship for Engineers and Scientists
ORIE 5150 - Economic Analysis of Engineering Systems (not offered 2019-20)

Advanced Technology

MAE 4580 - Introduction to Nuclear Science and Engineering (not offered 2018-19)
MAE 4590 - Introduction to Controlled Fusion: Principles and Technology
MAE 4320 - MicroElectro Mechanical Systems (not offered 2018-19)
MAE 5010 - Future Energy Systems
ECE 4300 - Lasers and Optoelectronics
BEE 4010 - Renewable Energy Systems
CHEME 6662 - Solar Energy Module
MSE 5862 - Introduction to Electronic Materials
MSE 5310 - Introduction to Ceramics (not offered 2019-20)
MSE 5850 - Electronic, Magnetic, and Dielectric Properties of Materials