Astronautics

Astronautics

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 6780 - Feedback Control Systems
MAE 5790 - Nonlinear Dynamics and Chaos
MAE 6700 - Advanced Dynamics
MAE 6850 - Hamiltonian Dynamics (not offered 2019-20)
MAE 5770- Formal Methods for Robotics
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 5180 - Multivariable Control Theory
MAE 5780 - Feedback Control Systems
MAE 5790 - Nonlinear Dynamics and Chaos
MAE 6700 - Advanced Dynamics
MAE 6850 - Hamiltonian Dynamics (not offered 2019-20)
MAE 6750- Formal Methods for Robotics
MAE 6820 - Methods of Applied Mathematics II (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 - Interstellar 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
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<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>MAE 6640</td>
<td>Mechanics of Bone (not offered 2018-19)</td>
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<tr>
<td>BME 4440</td>
<td>Science Policy Bootcamp: Concept to Conclusion</td>
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<tr>
<td>BME 5390</td>
<td>Biomedical Materials and Devices for Human Body Repair</td>
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<td>MAE 6680</td>
<td>Cancer for Engineers and Physicists</td>
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<tr>
<td>ARCH 4621</td>
<td>Sustainable Architecture: The Science and Politics of Green Building</td>
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<tr>
<td>ARCH 5612</td>
<td>Structural Concepts</td>
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<td>ARCH 5613</td>
<td>Structural Systems</td>
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<td>ARCH 5611</td>
<td>Environmental Systems I: Site and Sustainability</td>
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<td>ARCH 5616</td>
<td>Environmental Systems II: Building Dynamics</td>
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<td>CEE 4510</td>
<td>Microbiology for Environmental Engineering</td>
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<td>CEE 6910</td>
<td>Principles of Project Leadership</td>
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<td>EAS 4790</td>
<td>Paleobiology</td>
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<td>NBA 5070</td>
<td>Entrepreneurship for Engineers and Scientists</td>
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<tr>
<td>ORIE 5150</td>
<td>Economic Analysis of Engineering Systems (not offered 2019-20)</td>
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**Advanced Technology**

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