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 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 4910 - 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
CHME 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