Integrated Innovation Institute

Master of Science in Technology Ventures
Applied Engineering Courses – 2020-21

For students enrolled in the MSTV-Dual degree program, 36 units of pre-approved Applied Engineering & Technology coursework must be completed during the home engineering degree requirements. These units will double count within the MSTV degree and MS in Engineering degree.

Biomedical Engineering

42-447 Rehabilitation Engineering (9-units)
42-630 Introduction to Neuroscience for Engineers
42-632 Neural Signal Processing (crosslisted with 18-698)
42-640, Image-Based Computational Modeling & Analysis (Crosslisted with 24658)
42-642 Biological Fluid Mechanics
42-643 Microfluids
42-670 Biomaterial Host Interactions in Regenerative Medicine
42-671 Precision Medicine for Biomedical Engineers (9-units)
42-678 Medical Device Innovation (6-units)
42-679 Medical Device Realization (6-units)
42-341 Introduction to Biomechanics (9-units)
42-611 Engineering Biomaterials
42-612 Tissue Engineering
42-613 Polymeric Biomaterials (9-units)
42-648 Cardiovascular Mechanics
42-661 Surgery for Engineers (9-units)
42-672 Fundamentals of Biomedical Imaging and Image Analysis
42-674 Engineering for Survival: ICU Medicine (9-units)
42-673 Stem Cell Engineering (9-units)
42-675  Fundamentals of Computational Biomedical Engineering
42-691, Biomechanics of Human Movement (Crosslisted with 24663)
42-735  Medical Images Analysis
42-737  Biomedical Optical Imaging
42-744  Medical Devices
42-772  Special Topics: Applied Nanoscience and Nanotechnology (crosslisted with 27-765)

**Chemical Engineering**
06-606  Comp. Methods for Large-Scale Process Design & Analysis (9 units)
06-607  Physical Chemistry of Colloids & Surfaces (9 units)
06-609, Physical Chemistry of Macromolecules (*9 Units)
06-614, Special Topics: Atmospheric Nanoparticles & Climate
06-620  Global Atmospheric Chemistry: Fundamentals and Data Analysis
06-626, Bacterial Cell Culture & Fermentation (*6 unit mini)
06-627, Mammalian Cell Culture (*6 Units)
06-635  Production & Supply Chain Optimization
06-663  Analysis and Modeling of Transport Phenomena
06-665  Process System Modeling
06-681, Special Topics: Data Science & Machine Learning in Chemical Engineering (6-units)
06-702  Advanced Reaction to Kinetics (PhD Core)
06-704  Advanced Heat and Mass Transfer (PhD Core)
06-705, Advanced Chemical Engineering Thermodynamics
06-713, Mathematical Techniques in Chemical Engineering
06-714, Surfaces & Adsorption
06-720  Advanced Process Systems Engineering (PhD Core)
06-722  BioProcess Design

**Civil and Environmental Engineering**
12-711  BIM for Engineering, Construction and Facility Management
12-714, Environmental Life Cycle Assessment
12-718  Environmental Engineering Sustainability and Science Project
12-724  Biological Wastewater Treatment
12-728 Remediation Engineering
12-735 Special Topics: Urban Systems Modeling
12-740 Data Acquisition (6-units)
12-741 Data Management (6-units)
12-745 Advanced Infrastructure Systems Project
12-748 Mechanical and Electrical System Design for Buildings (6-units)
12-749, Climate Change Adaptation (6 units)
12-750 Infrastructure Management (Cross-listed with 19-617)
12-752 Special Topics: Data-Driven Building Energy Management (6-units)
12-761 Special Topics: Sensing and Data Mining for Smart Structures and Systems

**Electrical and Computer Engineering**
18-482, Telecommunications Technology & Policy for the Internet Age (cross-listed with 19-402 & 19-722)
18-600, Foundations of Computer Systems
18-612 Neural Technology: Sensing and Stimulation
18-613 Nano-Bio-Photonics
18-631 Introduction to Information Security
18-639 Policies of the Internet (crosslisted with 19-639)
18-645 How to Write Fast Code
18-650 Policies of a Wireless System
18-651 Networked Cyber-Physical Systems
18-662, Principles & Engineering Applications of AI
18-697 Statistical Discovery and Learning
18-698 Neural Signal Processing (crosslisted with 42-632)
18-730 Introduction to Computer Security
18-733, Applied Cryptography
18-738, Sports Technology
18-734 Foundations of Privacy
18-739F Special Topics in Security: Security of Fairness and Deep Learning
18-745 Rapid Prototyping of Computing Systems
18-785, Data Inference, and Applied Machine Learning
18-794 Pattern Recognition Theory
Materials Science and Engineering
27-700 Special Topics: Energy Storage Materials and Systems
27-701, Additive Manufacturing Laboratory (Cross-listed with 24-633 & 39-603)
27-702 Metal-Environment Reactions
27-703, Additive Manufacturing and Materials
27-705 Nanostructured Materials
27-706 Hard and Superhard Materials (*6 units)
27-709 Engineering Biomaterials
27-715 Applied Magnetism and Magnetic Materials
27-721 Processing Design
27-724 Materials for Energy Storage
27-725 Materials in Nuclear Energy Systems
27-728 Materials for Future Energy Systems
27-729 Solid State Devices for Energy Conversion
27-731 Special Topics: Hard and Superhard Materials
27-733 Principles of Growth and Processing of Semiconductors
27-737 Mechanical Behavior in Extreme Environments
27-742 Processing and Properties of Thin Films
27-752 Foundations of Semiconductor Nanostructures
27-764 Special Topics: Data Analytics for Materials Science
27-765 Special Topics: Engineering Optical and Thermal Energy Transport: Energy Efficiency Applications
27-765 Additive Manufacturing and Materials
27-765 Additive Manufacturing Laboratory (crosslisted with 39-603)
27-765 Special Topics: Applied Nanoscience and Nanotechnology (crosslisted with 47-772)
27-792 Solidification Processing

Mechanical Engineering
24-613 Special Topics: Particle Technology
24-628, Energy Transport & Conversion at a Nanoscale
24-629 Direct Solar and Thermal Energy Conversion
24-632 Special Topics: Additive Manufacturing Processing and Product Development (crosslisted with 39-601 & 24-632)
24-633, Additive Manufacturing Laboratory (Cross-listed with 27-701 & 39603)
24-642 Fuel Cell Systems
24-645 Special Topics: Air Pollutant Sensor Design and Application
24-651 Materials Selection for Mechanical Engineers
24-656, Introduction to Vibrations with Applications (Cross-listed with 24-356)
24-658 Computational Bio-Modeling and Visualization (crosslisted with 42-640)
24-662 Special Topics: Robotic Systems and Internet of Things
24-663, Special Topics: Biomechanics of Human Movement (Cross-listed with 42-691)
24-683 Design for Manufacture and the Environment
24-671 Special Topics: Electromechanical Systems Design
24-672 Special Topics in DIY Design and Fabrication
24-673 Soft Robots - Mechanics, Design and Modeling
24-689 Special Topics: Modern Manufacturing in Steeltown
24-775 Special Topics: Robot Design and Experimentation
24-778 Mechatronic Design (crosslisted with 16-778, 18-578, & 24-778)
24-787 Artificial Intelligence and Machine Learning for Engineering Design
24-788 Artificial Intelligence and Machine Learning – Project
24-789, Special Topics: Deep Learning for Engineers

**College of Engineering**
39-603 Additive Manufacturing Laboratory (Cross-listed with 27-701 & 24633)

**Chemistry**
09-860 Special Topics in Computational Chemistry: Machine Learning for Experimentalists (2 6-unit minis)

**School of Computer Science**
16-865 – Advanced Mobile Robot Development
17-630, Data Structures and Algorithms for Engineers

NOTE: This is a sample list of Applied Engineering & Technology coursework; MSTV students will receive an official list of eligible courses each semester as part of the advising process.

Last updated: 04/17/2020