

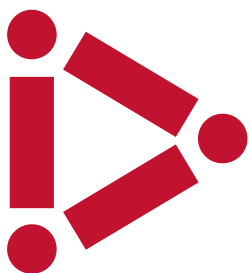
## **Integrated Innovation Institute**

### **Master of Science in Technology Ventures Applied Engineering Courses – 2021-22**

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)



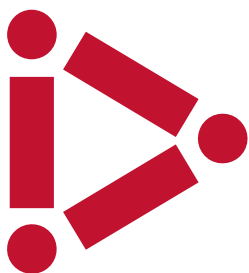
42-675 Fundamentals of Computational Biomedical Engineering  
42-691, Biomechanics of Human Movement (Crosslisted with 24663)  
42-696, ST: Wearable Health Technologies  
42-735 Medical Images Analysis  
42-737 Biomedical Optical Imaging  
42-744 Medical Devices  
42-772 Special Topics: Applied Nanoscience 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**

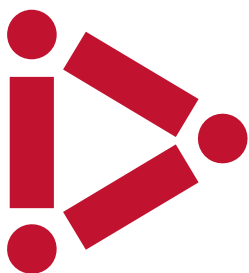
12-704, Probability & Estimation Methods for Engineering Systems  
17-706, Civil Systems Investment Pricing & Planning  
12-711 BIM for Engineering, Construction and Facility Management



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  
12-774, Foundations of Intelligent Infrastructure Systems  
12-783, Geographic Information Systems

### **Electrical and Computer Engineering**

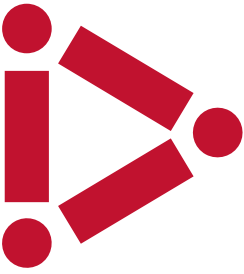
18-482, Telecommunications Technology & Policy for the Internet Age (cross-listed with 19-402 & 19-722)  
18-600, Foundations of Computer Systems  
18-612 Neural Technology: Sensing and Stimulation  
18-613 Nano-Bio-Photonics  
18-631 Introduction to Information Security  
18-638 Mobile & IoT Security  
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  
18-660, Optimization  
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  
18-743, Neuromorphic Computer Architecture & Processor Design  
18-734 Foundations of Privacy  
18-739F Special Topics in Security: Security of Fairness and Deep Learning  
18-741, Computer Networks  
18745 Rapid Prototyping of Computing Systems  
18-785, Data Inference, and Applied Machine Learning  
18-787, Data Analytics  
18-794 Pattern Recognition Theory  
18-847, ST in Computer Systems: Neuromorphic Computer Architecture

### **Materials Science and Engineering**

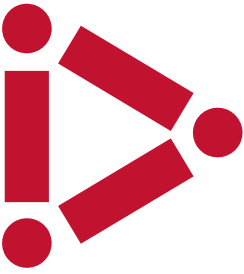
27-700 Special Topics: Energy Storage Materials and Systems  
27-701, Additive Manufacturing Laboratory (Cross-listed with 24-633 & 39-603)  
27-702 Metal-Environment Reactions  
27-703, Additive Manufacturing and Materials  
27-705 Nanostructured Materials  
27-706 Hard and Superhard Materials (\*6 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)
- 24-682, Special Topics: Design for the Fourth Industrial Revolution
- 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
- 24-678 Special Topics: Computer Vision for Engineers
- 24-679 Special Topics: Designing & Deploying AI/ML Systems
- 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**

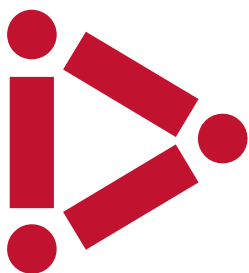
09-860 Special Topics in Computational Chemistry: Machine Learning for Experimentalists (2 6-unit minis)

### **School of Computer Science**

05-818, Design Educational Games  
15-650, Algorithms & Advanced Data Structures  
15-686, Neural Computation  
15-694, Cognitive Robots  
16-865, Advanced Mobile Robot Development  
16-761, Mobile Robots  
16-785, Integrated Intelligence in Robotics: Vision Language Planning: Social Robots  
16-861, Space Robotics  
16-887 – ST: Robotic Caregivers & Intelligent Physical Collaboration  
17-630, Data Structures and Algorithms for Engineers  
17-634, Applied Machine Learning (6 units)  
17-636, Applied Distributed Systems  
17-644, Applied Deep Learning (6 units)  
17-647, Data Intensive & Scalable Systems  
17-637, Web Application Development

### **ETIM**

19-707, Multiple Criteria & Decision Making



### **INI**

14-741, Introduction to Information Security

14-813, Special Topics: Security & Privacy Enhancing Technologies

### **EPP**

19-670, Quantitative Entrepreneurship: Analysis for New Technology Commercializing

### **HCI**

05-617, Design of Artificial Intelligence Products

05-795, Applications of Cognitive Science

05-834, Applied Machine Learning

05-692, Interaction Design Overview

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**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: 11/30/21