

## Metals Track

### Core Courses

EMA 6313	Advanced Materials Principles 1
EMA 6316	Materials Thermodynamics
EMA 6136	Diffusion, Kinetics, and Transport Phen
EMA 6114	Advanced Materials Principles 2
EMA 6808	Error Analysis & Optimization Meth

### Required Electives (Choose at least 2)

EMA 6106	Advanced Phase Diagrams
EMA 6107	High Temp Materials
EMA 6625	Advanced Metals Processing

### Optional Electives (choose 3)

EMA 6510	Survey of Materials Analysis Tech
EMA 6518	Transmission Electron Microscopy
EMA 6938	X-Ray Methods of Materials Analysis
EMA 6507	Scanning Electron Microscopy & Microan
EML 6507	Wear of Materials
EAS 6242	Advanced Structural Composites
EML 5526	Finite Element Analysis and Application
EML 6934B	Failure of Materials in Mechanical Design
EGM 5533	Applied Elasticity & Adv Mech of Solids
EGM 6570	Principles of Fracture Mechanics

## Polymers Track

### Core Courses

EMA 6313	Advanced Materials Principles 1
EMA 6316	Materials Thermodynamics
EMA 6136	Diffusion, Kinetics, and Transport Phen
EMA 6114	Advanced Materials Principles 2
EMA 6808	Error Analysis & Optimization Meth

### Required Electives

EMA 6165	Polymer Physical Science
EMA 6461	Polymer Characterization

### Optional Electives (choose 3)

EMA 6580	Science of Biomaterials I
EMA 6510	Survey of Materials Analysis Tech
EMA 6938	X-Ray Methods of Materials Analysis
EMA 6507	Scanning Electron Microscopy & Microan
EMA 6518	Transmission Electron Microscopy
EML 6507	Wear of Materials
EAS 6242	Advanced Structural Composites
EML 5526	Finite Element Analysis and Application
EML 6934B	Failure of Materials in Mechanical Design
EGM 6321	Principles of Engineering Analysis 1
ESI 6912	Design of Experiments

## Electronic Materials Track

### Core Courses

EMA 6313	Advanced Materials Principles 1
EMA 6316	Materials Thermodynamics
EMA 6136	Diffusion, Kinetics, and Transport Phen
EMA 6114	Advanced Materials Principles 2
EMA 6808	Error Analysis & Optimization Meth

### Required Electives

EMA 6110	Electronic Theory of Materials
EMA 6616	Adv. Electronic Materials Process.

### Optional Electives (choose 3)

EMA 6938	Organic Electronics
EMA 6510	Survey of Materials Characterization
EMA 6507	Scanning Electron Microscopy & Microan
EMA 6518	Transmission Electron Microscopy
EMA 6938	X-Ray Methods of Materials Analysis
EEE 5426	Intro Quantum Mech for Nanodev
EEE 6397	Semicond Dev Theory
EEE 5400	Future of uElectronics Techn
EEE 6382	Semicond Phys Electronics
EML 6934B	Failure of Materials in Mechanical Design
EGM 6341	Num. Meth. Of Engin. Analy.

## Structural Materials Track

### Core Courses

EMA 6313	Advanced Materials Principles 1
EMA 6316	Materials Thermodynamics
EMA 6136	Diffusion, Kinetics, and Transport Phen
EMA 6114	Advanced Materials Principles 2
EMA 6808	Error Analysis & Optimization Meth

### Required Electives

EMA 6715	Fracture of Brittle Materials
EMA 6107	High Temperature Materials
EMA 6938	X-Ray Methods of Materials Analysis

### Optional Electives (choose 2)

EMA 6106	Advanced Phase Diagrams
EMA 6518	Transmission Electron Microscopy
EMA 6510	Survey of Materials Analysis Tech
EMA 6507	Scanning Electron Microscopy & Microan
EML 6507	Wear of Materials
EAS 6242	Advanced Structural Composites
EML 5526	Finite Element Analysis and Application
EML 6934B	Failure of Materials in Mechanical Design
EGM 5533	Applied Elasticity & Adv Mech of Solids
EGM 6570	Principles of Fracture Mechanics
EGM 6611	Continuum Mechanics

## **Certificates**

### **Materials Characterization Certificate**

EMA 6510 Survey of Materials Analysis Tech  
EMA 6938 X-Ray Methods of Materials Analysis  
EMA 6507 Scanning Electron Microscopy & Microan

### **Other (future certificate in approval process)**

EMA 6938H Adv in Biomaterials & Tissue Eng (Hench)  
EMA 6938Y Clinical Application of Biomaterials, Tissue  
Engineering and Regenerative Medicine

### **Sustainable Engineering Certificate (EES Certificate, 1 MSE Course)**

EMA 6938 Materials & Sustainability  
ENV 6932 Green Engineering Design & Sustainability  
EES 6318 Principles of Industrial Ecology