

Curriculum

□ Undergraduate Program

| Classification | Subject No. | Subject Name | Lecture:Lab.: Credit (Homework) | Semester | Remark |
|----------------------|-------------|---|---|--------------|--------|
| Basic Course | MS211 | Introduction to Materials Science and Engineering | 3:0:3(3) | Spring, Fall | |
| Major (Mandatory) | MS212 | Thermodynamics of Materials | 3:0:3(3) | Spring | |
| | MS311 | Phase Transformation and Microstructure Evolution | 3:0:3(3) | Spring | |
| | MS321 | Advanced Materials Lab I | 1:6:3(6) | Spring | |
| | MS322 | Advanced Materials Lab II | 1:6:3(6) | Fall | |
| Major (Elective) | MS213 | Crystallography and Diffraction | 2:3:3(3) | Fall | |
| | MS214 | Thermochemical Process in Materials Science and Engineering | 3:0:3(3) | Fall | |
| | MS215 | Mechanical Behavior of Materials | 3:0:3(3) | Fall | |
| | MS216 | Introduction to Electrical and Magnetic Properties of Materials | 3:0:3(3) | Spring | |
| | MS310 | Introduction to Quantum Chemistry | 3:0:3(3) | Spring | |
| | MS331 | Nanomaterials Science & Technology | 3:0:3(3) | Spring | |
| | MS340 | Polymer Materials | 3:0:3(3) | Fall | |
| | MS354 | Corrosion and Oxidation of Metals | 3:0:3(3) | Fall | |
| | MS360 | Mechanics of Materials | 3:0:3(3) | Fall | |
| | MS371 | Structure and Properties of Engineering Alloys | 3:0:3(3) | Spring | |
| | MS381 | Introduction to Solid State Physics | 3:0:3(3) | Fall | |
| | MS412 | Material Design and Manufacturing Process | 2:3:3(5) | Spring | |
| | MS415 | Introduction to Semiconductor Devices | 3:0:3(2) | Spring | |
| | MS421 | Introduction to Ceramics | 3:0:3(3) | Spring | |
| | MS424 | Understanding of Electronic Systems for Materials Engineers | 3:0:3(3) | Fall | |
| | MS425 | Introduction to Biomaterials | 3:0:3(3) | Spring | |
| | MS431 | Nano-Biomaterials | 3:0:3(3) | Fall | |
| | MS481 | Semiconductor Processing | 3:0:3(2) | Fall | |
| | MS482 | Special Topics in Materials Science and Engineering | 3:0:3(3) | Spring, Fall | |
| | | MS490 | Research in Materials Science and Engineering | 0:6:3(3) | |
| | MS495 | Individual Study | 0:6:1(3) | | |
| | MS496 | Seminar | 1:0:1(3) | | |

※ Note: 400 and 500 level courses open to both undergraduate and graduate students

□ Graduate Program

| Classification | Subject No. | Subject Name | Lecture:Lab.: Credit (Homework) | Semester | Remark |
|--------------------------------|--|--|---------------------------------------|-------------|-------------|
| Mandatory General Course | CC010 | Special Lecture on Leadership | 1:0:0 | Spring-Fall | required |
| | CC020 | Ethics and Safety I | 1AU | Spring-Fall | |
| | CC500 | Scientific Writing | 3:0:3 | Spring-Fall | choose 1 |
| | CC510 | Introduction to Computer Application | 2:3:3 | Spring-Fall | |
| | CC511 | Probability and Statistics | 2:3:3 | Spring-Fall | |
| | CC512 | Introduction to Materials and Engineering | 3:0:3 | Spring-Fall | |
| | CC513 | Engineering Economy and Cost Analysis | 3:0:3 | Fall | |
| | CC522 | Introduction to Instruments | 2:3:3 | Fall | |
| | CC530 | Entrepreneurship and Business Strategies | 3:0:3 | Fall | |
| | CC531 | Patent Analysis and Invention Disclosure | 3:0:3 | Spring-Fall | |
| CC532 | Collaborative System Design and Engineering | 4:0:4 | Spring | | |
| Elective Course | MS511 | Thermodynamics and Phase Equilibria | 3:0:3(3) | Fall | |
| | MS513 | Structure and Defects of Solids | 3:0:3(3) | Spring | |
| | MS514 | Mechanical Behavior of Materials | 3:0:3(3) | Fall | |
| | MS521 | Statistical Thermodynamics in Materials System | 3:0:3(3) | Spring | |
| | MS523 | Electron Microscopy | 2:3:3(3) | Spring | |
| | MS524 | Phase Equilibria and Phase Diagrams | 3:0:3(3) | Fall | |
| | MS536 | Thin Film Processes | 3:0:3(2) | Spring | |
| | MS541 | Diffusion in Solid | 3:0:3(3) | Fall | |
| | MS542 | Nanoscale Surface Analysis | 2:3:3(3) | Fall | |
| | MS543 | Introduction to Dislocations | 3:0:3(3) | Spring | |
| | MS544 | Engineering of Soft Materials | 3:0:3(3) | Fall | |
| | MS545 | Healthcare Materials | 3:0:3(3) | Fall | |
| | MS551 | Waves and Materials | 3:0:3(3) | Spring | |
| | MS572 | Composite Materials | 3:0:3(3) | Fall | |
| | MS575 | Non-Crystalline Materials | 3:0:3(3) | Fall | |
| | MS590 | Design of Nanomaterials and Processing | 3:0:3(3) | Fall | |
| | MS591 | Emerging nanofabrication technology | 3:0:3(3) | Fall | |
| | MS592 | Inorganic Nanomaterials | 3:0:3(3) | Spring | |
| | MS612 | Phase Transformation in Solids | 3:0:3(3) | Fall | |
| | MS613 | Solid State Physics | 3:0:3(3) | Fall | |
| | MS615 | Structure and Properties of Interfaces | 3:0:3(3) | Fall | |
| | MS617 | Electrochemistry of Solids for Materials Scientist | 2:3:3(3) | Fall | |
| MS619 | Electronic Ceramic Materials | 3:0:3(2) | Fall | | |
| MS620 | Optical Materials | 3:0:3(3) | Spring | | |
| MS621 | Dielectric Materials | 3:0:3(3) | Spring | | |
| MS624 | Optical properties of nanostructured materials | 3:0:3(3) | Fall | | |

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|--------------------|-------------|---|--|-------------|--------|--|
| Elective Course | MS631 | Alloy Design and Applications | 3:0:3(3) | Fall | | |
| | MS632 | Creep and Superplasticity | 3:0:3(3) | Spring | | |
| | MS633 | Solid State Chemical Sensors | 3:0:3(3) | Fall | | |
| | MS634 | Crystal Physics | 3:0:3(3) | Spring | | |
| | MS635 | Semiconductor Integrated Process Design | 3:0:3(2) | Fall | | |
| | MS642 | Electronic Packaging Technology | 3:0:3(2) | Spring | | |
| | MS643 | Sintering | 3:0:3(3) | Fall | | |
| | MS644 | Advanced Polymeric Materials | 3:0:3(3) | Fall | | |
| | MS653 | Microstructure Analysis in Materials Science | 2:3:3(3) | Spring | | |
| | MS654 | Surface Science | 3:0:3(2) | Spring | | |
| | MS656 | Corrosion & Mechanochemical Reactions on Surfaces | 2:3:3(3) | Fall | | |
| | MS657 | Environmental Effects on the Degradation of Materials | 3:0:3(3) | Spring | | |
| | MS658 | Materials science aspects of rechargeable batteries | 3:0:3(3) | Fall | | |
| | MS660 | Fracture Mechanics | 3:0:3(3) | Spring | | |
| | MS661 | Fatigue Phenomena in Metals | 3:0:3(3) | Fall | | |
| | MS662 | Mechanical Properties of Thin Films | 3:0:3(3) | Spring | | |
| | MS670 | Sol-Gel Nano Materials and Process | 3:0:3(3) | Fall | | |
| | MS671 | First-principles Modeling of Materials | 3:0:3(3) | Spring-Fall | | |
| | MS672 | Special Topics on Nano Material Technology | 3:0:3(3) | Spring-Fall | | |
| | MS673 | Photochemical Materials | 3:0:3(3) | Spring | | |
| | MS684 | Principles of Semiconductor Devices | 3:0:3(3) | Spring | | |
| | MS685 | Physics of Magnetism and Magnetic Materials | 3:0:3(2) | Fall | | |
| | MS686 | Photovoltaic Materials | 3:0:3(3) | Spring | | |
| | MS696 | Special Topics in Advanced Materials I | 3:0:3(3) | Spring-Fall | | |
| | MS697 | Special Topics in Advanced Materials II | 3:0:3(3) | Spring-Fall | | |
| | MS698 | Special Topics in Advanced Materials III | 3:0:3(3) | Spring-Fall | | |
| | Research | MS960 | Research in Materials Science and Engineering (Master) | | | |
| | | MS966 | Seminar (Master) | 1:0:1(3) | | |
| MS980 | | Research in Materials Science and Engineering (Doctorate) | | | | |
| MS986 | | Seminar (Doctorate) | 1:0:1(3) | | | |

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