MS (Non-Thesis) students must take 32 credits, all of which must be at the 500 level. This must include 4 Core Courses, 2 Concentration Courses, Practicum Courses up to 8 credits; Elective Course 4 credits. Only one 400-level course may be taken, with advisor approval, if needed as a prerequisite for another course in the program. MS students must maintain a cumulative GPA of 3.00 to remain in good academic standing and to graduate. All graduate courses are counted in the GPA. Grades of C− or lower are not acceptable for the MS degree.

**CORE** Four courses, one each from A, B, C and D. Circle the course used for A and D. (16 credits)

A. ENG MS 577 Elec, Opt, Mag Prop of Mtls OR CAS PY 543 Introduction to Solid State Physics (by instructor approval only) Semester/Grade _______

B. MS 505/ME 505 Thermodynamics and Statistical Mechanics Semester/Grade ____________________________

C. MS 503/ME 503 Kinetic Processes in Materials Semester/Grade ____________________________

D. MS 574/EC 574 Physics of Semiconductor Materials *or* MS 504 Polymers and Soft Materials *or* MS 582/ME 582 Mechanical Behavior of Materials *or* MS 508/ME 508 Computational Methods in Materials Science Semester/Grade ____________________________

**CONCENTRATION** Two courses from one area. (8 credits)

A. **Biomaterials**
   - ENG BE 506 Phys Chem of Cell Structure and Machinery
   - ENG BE 521 Continuum Mechanics for Biomedical Engineers
   - ENG MS/BE/ME 523 Mechanics of Biomaterials
   - ENG MS/ME/BE 524 Skeletal Tissue Mechanics
   - ENG BE 533 Bioheology
   - ENG MS/BE/ME 549 Structure & Function Extracellular Matrix
   - GRS CH 550 Materials Chemistry
   - GRS CH 621 Biochemistry
   - GRS CH 629 DNA Nanotechnology
   - ENG MS/BE/ME 527 Principles & Applications of Tissue Eng
   - ENG MS/BE 736 Biomedical Transport Phenomena
   - ENG MS/ME 742 Bio-fluids and Structural Mechanics
   - GRS PY 744 Polymer Physics
   - GRS PY 771 Systems Biology for Physical Scientists & Eng

B. **Electronic/Photonic Materials**
   - ENG EC 560 Introduction to Photonics
   - ENG EC 575 Physics of Semiconductor Devices
   - ENG EC 578 Fabrication Tech for Integrated Circuits
   - GRS PY 741 Solid State Physics I
   - GRS PY 742 Solid State Physics II
   - GRS PY 745 Experimental Surface Physics and Chemistry
   - ENG MS/EC 764 Optical Measurement
   - ENG EC 770 Guided-wave Optoelectronics
   - ENG MS/EC 774 Semiconductor Quant. Strctr & Phot Dev
   - ENG EC 776 Fundamentals of Nanoelectronics

C. **Materials for Energy and Environment**
   - ENG MS/ME 527 Trans. Phenomena in Matls Processing
   - ENG MS/ME 532 Atomic Structure & Dislocations in Matls
   - ENG MS/ME 535 Green Manufacturing
   - ENG MS/ME 545 Electrochemistry of Fuel Cells & Batteries
   - GRS CH 550 Materials Chemistry
   - GRS CH 631 Structure and Bonding
   - ENG MS/EC 573 Solar Energy Systems
   - GRS PY 741 Solid State Physics I
   - GRS PY 742 Solid State Physics II
   - GRS PY 745 Experimental Surface Physics and Chemistry
   - ENG MS/ME 781 Electroceramics

D. **Nanomaterials**
   - ENG MS/ME 530 Intro to Micro and Nanomechanics of Solids
   - GRS CH 550 Materials Chemistry
   - ENG MS/ME 555 MEMS Fabrication and Materials
   - GRS CH 631 Structure and Bonding
   - ENG MS/ME 718 Advanced Topics in Nanotechnology
   - ENG MS/ME 735 Computational Nanomechanics
   - GRS PY 745 Experimental Surface Physics and Chemistry
   - ENG EC 777 Nanostructure Optics
   - ENG MS/ME 778 Micromachined Transducers

A. ☐ B. ☐ C. ☐ D. ☐ (select area completed)

**PRACTICUM** One to two courses. (4 to 8 credits) Course/Sem/Grade ____________________________

Course/Sem/Grade ____________________________

**ELECTIVE** If only 4 credits of Practicum are taken, 4 credits from the list below, or from above if not used to satisfy the core, concentration, or practicum requirements. Course/Sem/Grade ____________________________

Course/Sem/Grade ____________________________

ENG MS 500 Special Topics
ENG MS/ME 507 Process Modeling and Control
ENG ME 516 Statistical Mechanical Concepts in Engineering
ENG MS/ME 526 Simulation of Physical Processes
ENG MS/ME 534 Material Technology for Microelectronics
ENG MS/ME/EC 579 Microelectronic Device Mfg

ENG MS 527 Trans. Phenomena in Matls Processing
ENG MS/ME 532 Atomic Structure & Dislocations in Matls
ENG MS/ME 535 Green Manufacturing
ENG MS/ME 545 Electrochemistry of Fuel Cells & Batteries
GRS CH 550 Materials Chemistry
GRS CH 631 Structure and Bonding
ENG MS/EC 573 Solar Energy Systems
GRS PY 741 Solid State Physics I
GRS PY 742 Solid State Physics II
GRS PY 745 Experimental Surface Physics and Chemistry
ENG MS/ME 781 Electroceramics
ENG MS/ME 530 Intro to Micro and Nanomechanics of Solids
GRS CH 550 Materials Chemistry
ENG MS/ME 555 MEMS Fabrication and Materials
GRS CH 631 Structure and Bonding
ENG MS/ME 718 Advanced Topics in Nanotechnology
ENG MS/ME 735 Computational Nanomechanics
GRS PY 745 Experimental Surface Physics and Chemistry
ENG EC 777 Nanostructure Optics
ENG MS/ME 778 Micromachined Transducers
ENG MS 925 Graduate Project
ENG MS 951 Independent Study

ENG MS 580 Theory of Elasticity
ENG MS 700 Adv Special Topics
GRS PY 745 Experimental Physics and Chemistry
CAS CH 751 Advanced Topics in Physical Chemistry
ENG MS 784 Topics in Materials Science Fall 2018