M S & E 1 — COOPERATIVE EDUCATION PROGRAM
1 credit.
Work experience which combines classroom theory with practical knowledge of operations to provide students with a background upon which to base a professional career. Enroll Info: None
Requisites: Sophomore standing
Course Designation: Workplace - Workplace Experience Course
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Fall 2020

M S & E 250 — INTRODUCTION TO MODERN MATERIALS
1 credit.
This course is designed to provide incoming students with an overview of the structure of materials and the relation to properties. Special emphasis is placed on modern materials and recent advancements in their application. Enroll Info: None
Requisites: None
Repeatable for Credit: No
Last Taught: Fall 2015

M S & E 260 — MATERIALS EXPERIENCE
2 credits.
Provides overview of the field of Materials Science and Engineering, with significant design and hands-on components. Highlights different types of materials, with a focus on describing the extensive impact that Materials Science and Engineering has had on society. Small teams provide hands-on experience in materials design, synthesis, and processing and the fabrication of materials with desired properties and function. Enroll Info: None
Requisites: (MATH 113, 114, or 171) and (CHEM 103, 109, or 115 or concurrent enrollment)
Repeatable for Credit: No
Last Taught: Fall 2020

M S & E 299 — INDEPENDENT STUDY
1-3 credits.
Independent study under faculty supervision. Enroll Info: None
Requisites: Consent of instructor
Repeatable for Credit: No
Last Taught: Spring 2021

M S & E 330 — THERMODYNAMICS OF MATERIALS
4 credits.
Introduction to thermodynamics of materials, equilibrium constants, solutions, heterogeneous equilibria and electrochemistry. Enroll Info: None
Requisites: MATH 222 or 276 and (CHEM 104, 109, or 115), or member of Engineering Guest Students
Repeatable for Credit: No
Last Taught: Fall 2020

M S & E 331 — TRANSPORT PHENOMENA IN MATERIALS
3 credits.
Basic principles of fluid flow, heat transfer and diffusion are introduced. Examples relevant to design and processing of materials including metals, semiconductors, glasses, polymers, and ceramics are given. Enroll Info: None
Requisites: M S & E 330 and (MATH 319, 320, 376, or concurrent enrollment), or member of Engineering Guest Students
Repeatable for Credit: No
Last Taught: Spring 2021

M S & E 332 — MACROPROCESSING OF MATERIALS
3 credits.
Topics include: ironmaking and steelmaking; production of Cu, Zn, Al and Mg by electrolysis; solidification processing of alloys by ingot casting, continuous casting and directional solidification; growth of bulk single crystals of semiconductors and ceramics from melts. Enroll Info: None
Requisites: M S & E 350, 351, or CBE 440, or member of Engineering Guest Students
Repeatable for Credit: No
Last Taught: Fall 2020

M S & E 333 — MICROPROCESSING OF MATERIALS
3 credits.
Integration of materials science theory and materials engineering practice as applied to the processing of materials at the microscopic level. Enroll Info: None
Requisites: M S & E 350, 351, or CBE 440, or member of Engineering Guest Students
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2021

M S & E 350 — INTRODUCTION TO MATERIALS SCIENCE
3 credits.
Basic structure and resulting properties, phase equilibria, metastability, rate and growth processes in solids. Enroll Info: None
Requisites: CHEM 103, 109, or 115, or member of Engineering Guest Students. Students with credit for M S & E 351 may not enroll in M S & E 350.
Repeatable for Credit: No
Last Taught: Spring 2021

M S & E 351 — INTRODUCTION TO MATERIALS SCIENCE-STRUCTURE AND PROPERTY RELATIONS IN SOLIDS
3 credits.
Introduction to: atomic, electronic, and defect structures in materials; diffusional, mechanical and electrical properties of materials; and the role of structure and defects in diffusional, mechanical, and electrical properties. Enroll Info: None
Requisites: (MATH 222 or 276) and (CHEM 103, 109, or 115), or member of Engineering Guest Students. Students with credit for M S & E 351 may not enroll in M S & E 350.
Repeatable for Credit: No
Last Taught: Fall 2020
M S & E 352 — MATERIALS SCIENCE-TRANSFORMATION OF SOLIDS
3 credits.

The basic factors that determine phase equilibria, structural and transformation characteristics of solids. Principles governing the thermodynamics and kinetics of phase transformations and microstructure evolution. Nucleation and growth processes in precipitation, recrystallization, solidification, oxidation, martensitic, ordering and spinodal reactions. Transformation behavior in polymers, biomaterials and nanomaterials. Enroll Info: None
Requisites: M S & E 350, 351, or member of Engineering Guest Students
Repeatable for Credit: No
Last Taught: Spring 2021

M S & E 360 — MATERIALS LABORATORY I
1 credit.

Laboratory instruction in sample preparation for and applications of quantitative microscopy, x-ray diffraction, and properties measurement in the context of structure-property relationships in materials. Enroll Info: None
Requisites: M S & E 350 or (M S & E 351 or concurrent enrollment) and declared in Materials Science and Engineering or Applied Mathematics, Engineering and Physics
Repeatable for Credit: No
Last Taught: Fall 2020

M S & E 361 — MATERIALS LABORATORY II
2 credits.

Experimental principles of materials science. Thermal, kinetic, structural, and materials synthesis experiments and associated concepts, data analysis, and presentation. Enroll Info: None
Requisites: Declared in Materials Science and Engineering or Applied Mathematics, Physics and Engineering) and M S & E 351 and 360
Repeatable for Credit: No
Last Taught: Spring 2021

M S & E 362 — MATERIALS LABORATORY III
2 credits.

Experiments in the mechanical and electronic properties of matter in bulk and thin films; computer instrument control; and data analysis. Enroll Info: None
Requisites: M S & E 361
Repeatable for Credit: No
Last Taught: Fall 2020

M S & E 363 — BASIC MATERIALS CHARACTERIZATION TECHNIQUES
2 credits.

The purpose of this course is to familiarize students with a variety of modern characterization techniques. Three general subject areas are covered: Physical Properties: Thermogravimetric analysis (TGA); differential scanning calorimetry (DSC); dynamic mechanical analysis (DMA); gel permeation chromatography (GPC). Spectroscopy, optical and x-ray: Ultraviolet/visible (VIS), molecular-infrared/Raman, Rheology; x-ray crystal and powder diffraction. Microscopy: scanning electron microscopy (SEM); SEM and energy dispersive analysis (EDS). Enroll Info: None
Requisites: Declared in Materials Science and Engineering or Applied Mathematics, Physics and Engineering) and M S & E 351 and 360
Repeatable for Credit: No

M S & E 401 — SPECIAL TOPICS IN MATERIALS SCIENCE AND ENGINEERING
1-3 credits.

Special topics of interest to students in materials science and engineering. Enroll Info: None
Requisites: M S & E 350, 351, or graduate/professional standing
Course Designation: Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Fall 2020

M S & E/CHEM 421 — POLYMERIC MATERIALS
3 credits.

Polymer chemistry and physics terminologies, structure-property relationship, polymer characterization, polymer synthesis, material requirements for optoelectronics including conjugated polymers, thin film transistors, light emitting diodes, non-linear optical materials, holographic data storage and liquid crystal polymers. Enroll Info: None
Requisites: CHEM 341, 343, or member of Engineering Guest Students
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Spring 2021

M S & E/N E 423 — NUCLEAR ENGINEERING MATERIALS
3 credits.

Fundamentals of fuel and cladding behavior in terms of thermal properties, chemical behavior and radiation damage. Enroll Info: None
Requisites: M S & E 350 or 351, or graduate/professional standing, or member of Engineering Guest Students
Repeatable for Credit: No
Last Taught: Fall 2020

M S & E/N E 433 — PRINCIPLES OF CORROSION
3 credits.

Requisites: M S & E 330, or graduate/professional standing, or member of Engineering Guest Students
Repeatable for Credit: No
Last Taught: Fall 2020

M S & E 434 — INTRODUCTION TO THIN-FILM DEPOSITION PROCESSES
3 credits.

Introduction to major thin-film deposition techniques and properties of thin films. Evaporation, plasma assisted processes with emphasis on sputter deposition, chemical vapor deposition ion beams. Film properties and characterization methods, applications. Enroll Info: None
Requisites: (M S & E 330 and 351), graduate/professional standing, or member of Engineering Guest Students
Repeatable for Credit: No
Last Taught: Spring 2021
M S & E 441 — DEFORMATION OF SOLIDS
3 credits.
Elastic and plastic deformation of real solids. Dislocation theory with applications to metals and alloys. Fracture, fatigue, brittle failure and methods for measuring the mechanical properties of materials. Enroll Info: None
Requisites: M S & E 352 or graduate/professional standing
Repeatable for Credit: No
Last Taught: Spring 2021

M S & E 448 — CRYSTALLOGRAPHY AND X-RAY DIFFRACTION
3 credits.
Crystal symmetry, projection methods, X-ray studies of structural problems in the solid state. Enroll Info: None
Requisites: M S & E 350 or 351, or graduate/professional standing, or member of Engineering Guest Students
Repeatable for Credit: No
Last Taught: Fall 2020

M S & E 451 — INTRODUCTION TO CERAMIC MATERIALS
3 credits.
Primary objectives are to: 1) analyze how atoms and ions combine to form 3D crystals and glasses; 2) examine phase equilibria to understand the driving forces for the formation of particular ceramic phases; 3) introduce and discuss the nature of defects in ceramics; 4) discuss the migration of matter and of charge in ceramics; and 5) discuss properties and processing technologies of ceramics. Enroll Info: None
Requisites: M S & E 352 and (M S & E 330 or concurrent enrollment), or graduate/professional standing, or member of Engineering Guest Students
Repeatable for Credit: No
Last Taught: Fall 2020

M S & E 456 — ELECTRONIC, OPTICAL, AND MAGNETIC PROPERTIES OF MATERIALS
3 credits.
Quantitative description of electronic, optical, and magnetic structure-property relationships of materials. Strategies for the development of new materials and introduction to applications of these materials. Enroll Info: None
Requisites: (M S & E 350 or 351) and (PHYSICS 202, 208, 248, or E C E/PHYSICS 235), graduate/professional standing, or member of Engineering Guest Students
Repeatable for Credit: No
Last Taught: Fall 2020

M S & E 460 — INTRODUCTION TO COMPUTATIONAL MATERIALS SCIENCE AND ENGINEERING
3 credits.
An introduction to the theoretical and computational tools for computational materials, with hands on homework and laboratories. Topics include may include atomistic simulation (e.g., molecular dynamics), mesoscale simulation (e.g., Phase field method), macroscale simulation (e.g., finite element method), thermodynamic and kinetic modeling (CALPHAD method), informatics (e.g., machine learning), and special topics (e.g., solar cell design, electronic device simulation, etc.) Enroll Info: None
Requisites: None
Repeatable for Credit: No
Last Taught: Spring 2021

M S & E 461 — ADVANCED METAL CASTING
3 credits.
Metallurgical and engineering principles applied in the foundry and related industries, primarily for those interested in foundry engineering. Enroll Info: None
Requisites: M S & E 350 or 352, graduate/professional standing, or member of Engineering Guest Students
Repeatable for Credit: No
Last Taught: Fall 2019

M S & E/M E 462 — WELDING METALLURGY
3 credits.
Metallurgical principles applied to welding; mechanisms of strengthening, phase equilibria, and microstructure of the weld zone. Modern processes including laser and electron beam welding. Enroll Info: None
Requisites: M S & E 350 or 351, or graduate/professional standing, or member of Engineering Guest Students
Repeatable for Credit: No
Last Taught: Spring 2021

M S & E 463 — MATERIALS FOR ELEVATED TEMPERATURE SERVICE
3 credits.
The design, properties, processing and selection of high temperature materials for structural applications. The fundamentals of diffusion, phase transformations, dislocation motion and oxidation governing the high temperature mechanical properties and structural performance of metallic and ceramic materials. Enroll Info: None
Requisites: M S & E 352, graduate/professional standing, or member of Engineering Guest Students
Repeatable for Credit: No
Last Taught: Fall 2020

M S & E 465 — FUNDAMENTALS OF HEAT TREATMENT
3 credits.
Principles of phase transformations, heat transfer and mechanical properties as applied to heat treatment practice. The design, modeling and analysis of heat treatment processes. Enroll Info: None
Requisites: M S & E 352, graduate/professional standing, or member of Engineering Guest Students
Repeatable for Credit: No
Last Taught: Fall 2018
M S & E 470 — CAPSTONE PROJECT I
1 credit.

Capstone experiences in materials design, selection, and application for MSE students. Emphasis on creativity and application of fundamental principles of public identification, experimental design, data acquisition and analysis, and presentation of results. Enroll Info: None
Requisites: Declared in Materials Science and Engineering, M S & E 352, 362, and (M S & E 331, 421, 441, 451, or 456)
Repeatable for Credit: No
Last Taught: Fall 2020

M S & E 471 — CAPSTONE PROJECT II
3 credits.

Capstone experiences in materials design, selection and application for MSE students. Emphasis on creativity and application of fundamental principles in problem identification, experimental design, data acquisition and analysis, and presentation of results. Enroll Info: None
Requisites: M S & E 470
Repeatable for Credit: No
Last Taught: Spring 2021

M S & E/CIV ENGR/G L E/GEOSCI 474 — ROCK MECHANICS
3 credits.

Classification of rock masses, stress and strain in rock, linear and non-linear behavior of rock, failure mechanisms, state of stress in rock masses, lab testing, geological and engineering applications. Enroll Info: None
Requisites: E M A 201, PHYSICS 201, 207, or 247, or graduate/professional standing, or member of Engineering Guest Students
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2021

M S & E 521 — ADVANCED POLYMERIC MATERIALS
3 credits.

This course is directed at graduate and advanced undergraduates with focused interest in polymeric materials. Basic principles of compatibility between macromolecules and small molecules, physical chemistry of blends and concepts in phase separation, and selected topics on materials design using self-assembly concepts. Enroll Info: None
Requisites: M S & E/CHEM/M S & E 421, graduate/professional standing, or member of Engineering Guest Students
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2020

M S & E 530 — THERMODYNAMICS OF SOLIDS
3 credits.

Thermodynamics of condensed matters as applied to materials science and engineering. Enroll Info: None
Requisites: M S & E 330, or graduate/professional standing, or member of Engineering Guest Students
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2020

M S & E/MA 541 — HETEROGENEOUS AND MULTIPHASE MATERIALS
3 credits.

Principles of the mechanics of solid multiphase systems. Role of heterogeneity and anisotropy in determining physical properties including elastic, dielectric and piezoelectric properties. Applications in lightweight structures, ultrastrong materials, materials for protection of the body, and materials for the replacement of human tissues. Materials with fibrous, lamellar, particular, and cellular structures. Heterogeneous materials of biological origin. Biomimetic and bio-inspired materials. Enroll Info: None
Requisites: E M A 303, M E 306, or M S & E 441, graduate/professional standing, or member of Engineering Guest Students
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2020

M S & E 551 — STRUCTURE OF MATERIALS
3 credits.

Atomic, nanoscale and microscale structure of materials. Course is designed for first year graduate students with interests in materials research. Enroll Info: None
Requisites: M S & E 451, graduate/professional standing, or member of Engineering Guest Students
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2021

M S & E 553 — NANOMATERIALS & NANOTECHNOLOGY
3 credits.

The principal objectives of the course are to: i) introduce advanced processing methods for synthesizing nanomaterials, ranging from single nanoparticles to three-dimensional nanostructures, ii) discuss important thermodynamic and kinetic theories related to such processing, iii) describe methods for characterizing the structure and properties of nanomaterials, iv) discuss current and emerging applications for nanomaterials, and v) illustrate the interdisciplinary nature of nanotechnology and address critical challenges. Enroll Info: None
Requisites: M S & E 350, 351, or CBE 440, graduate/professional standing, or member of Engineering Guest Students
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2021
M S & E 560 — FUNDAMENTALS OF ATOMISTIC MODELING
3 credits.
Introduction to basic concepts of atomistic modeling in materials, including classical and quantum mechanical energy methods, energy optimization, molecular statistics, molecular dynamics, and Monte Carlo. Relevant aspects of thermodynamics, statistical mechanics, quantum mechanics, and computer programming will also be presented. Enroll Info: None
Requisites: None
Repeatable for Credit: No
Last Taught: Spring 2017

M S & E 570 — PROPERTIES OF SOLID SURFACES
3 credits.
Introduction to structure and electronic properties; surface energy; thermodynamics of surfaces; diffusion. Surface barriers, work function, vibrational and electronic states. Chemical interactions: chemisorption, oxidation, corrosion, absorption kinetics, catalysis. Experimental methods and applications in metals, semiconductors. Enroll Info: None
Requisites: PHYSICS 205, 241, 244, or (M S & E 351 and 333) or PHYSICS/ECE 235, graduate/professional standing, or member of Engineering Guest Students
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2021

M S & E 648 — ADVANCED X-RAY SCATTERING METHODS IN MATERIALS SCIENCE AND ENGINEERING
3 credits.
Advanced concepts and methods for the use of x-ray scattering, diffraction, and spectroscopy in materials science and engineering. Underpinning fundamental mathematical and scattering concepts, including kinematic and dynamical diffraction, diffuse scattering, and optical coherence in x-ray scattering. Practical aspects of experiments at synchrotron light sources and free electron lasers. Applications, including structure of metals and ceramics, polymeric materials, thin films and nanostructures, and magnetic materials. Enroll Info: None
Requisites: M S E 448, graduate/professional standing, or member of Engineering Guest Students
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2020

M S & E 660 — MESOSCALE MODELING OF MATERIALS
3 credits.
Classical theories, analytical and numerical modeling of various kinetic processes in materials. Including but not limited to transport, grain growth, phase separation, solidification, precipitation, chemical reactions, and multiphysics problems involving electrical, optical, mechanical, and magnetic properties of materials. Enroll Info: None
Requisites: (MATH 319, 320, or 376) and (M S E 350, 351, or CBE 440), graduate/professional standing, or member of Engineering Guest Students
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2021

M S & E 699 — INDEPENDENT STUDY
1-4 credits.
Courses in Metallurgical Engineering. Enroll Info: None
Requisites: Consent of instructor
Course Designation: Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2021

M S & E 702 — GRADUATE COOPERATIVE EDUCATION PROGRAM
1-2 credits.
Work experience that combines classroom theory with practical knowledge of operations to provide students with a background on which to develop and enhance a professional career. The work experience is tailored for MS students from within the U.S. as well as eligible international students. Enroll Info: None
Requisites: Consent of instructor
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Fall 2020

M S & E 748 — STRUCTURAL ANALYSIS OF MATERIALS
3 credits.
Introduction to transmission electron microscopy of materials, including imaging, diffraction, and microanalysis. Enroll Info: Knowledge of diffraction [such as M S & E 448] strongly encouraged.
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2020

M S & E 750 — IMPERFECTIONS AND MECHANICAL PROPERTIES
3 credits.
Mathematical theory of dislocations and other crystal imperfections; mechanical properties of crystals in relation to imperfections. Enroll Info: Knowledge of crystal structure and dislocations [such as M S & E 551] required.
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2016
M S & E 752 — ADVANCED MATERIALS SCIENCE: PHASE TRANSFORMATIONS
3 credits.

Phase transformations, nucleation theory and the role of structural imperfections, alloy phase equilibria, interface reactions and growth kinetics, continuous transformations. Enroll Info: Knowledge of diffusion and reactions [such as M S & E 352] required.
Requisites: (M S & E 530 or concurrent enrollment) and graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2021

M S & E 756 — STRUCTURE AND PROPERTIES OF ADVANCED ELECTRONIC MATERIALS
3 credits.

Prepares graduate students for research in electronic materials and related areas by examining (1) how does the physical structure of a material affect its electronic structure and properties: and (2) state-of-the-art advance electronic materials. Topics include: molecular and organic semiconductors; carbon nanomaterials (nanotubes, nanoribbons and graphene); advances in conventional bulk zinc-blende and wurtzite semiconductors; polycrystalline, amorphous, and disordered materials; state-of-the-art high- low-k dielectrics; and up-and-coming and next-generation materials. Enroll Info: Knowledge of solid state physics [such as PHYSICS 551 or M S & E 456] required.
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2019

M S & E 758 — TRANSMISSION ELECTRON MICROSCOPY LABORATORY
1 credit.

An introduction to the practice of transmission electron microscopy (TEM) and TEM sample preparation through hands-on laboratory training. Enroll Info: None
Requisites: M S & E 748 or concurrent enrollment
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2019

M S & E 760 — MOLECULAR DYNAMICS AND MONTE CARLO SIMULATIONS IN MATERIALS SCIENCE
3 credits.

Students will learn algorithms and develop codes for molecular dynamics (MD) and Monte Carlo (MC) simulations of materials. Techniques for parallel programming (MPI) will be introduced and practiced. Advanced techniques based on MD and MC will be presented. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2018

M S & E 790 — MASTER'S RESEARCH OR THESIS
1-9 credits.

Under faculty supervision. Enroll Info: None
Requisites: Declared in Materials Science and Engineering M.S., Ph.D., or doctoral minor
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2021

M S & E 803 — SPECIAL TOPICS IN MATERIALS SCIENCE
1-3 credits.

Topics vary. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2021

M S & E 890 — PRE-DISSERTATOR'S RESEARCH
1-9 credits.

Under faculty supervision. Enroll Info: None
Requisites: Declared in Materials Science and Engineering Ph.D. or doctoral minor.
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2021

M S & E 900 — MATERIALS RESEARCH SEMINAR
1 credit.

Introduces graduate students to the breadth, wealth and practices of materials research at the University of Wisconsin and in the professional materials research community. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2021

M S & E 990 — RESEARCH AND THESIS
1-9 credits.

Under faculty supervision. Enroll Info: None
Requisites: Declared in Materials Science and Engineering Ph.D. or doctoral minor.
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2021

M S & E 999 — INDEPENDENT WORK
1-3 credits.

Independent study under faculty supervision. Enroll Info: None
Requisites: Consent of instructor
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2000