Courses listed in this section describe all courses approved for offering by the University of Arkansas. The courses are listed alphabetically by subject with the subject code in parenthesis following. The word “course” refers to a unit of academic instruction, while the word “class” refers to a course that has been scheduled during a semester or summer session with a certain number of prescribed meetings each week. Many courses are offered as classes every semester while many others are offered less frequently. Successful completion of a class usually earns a specified number of semester hours of credit toward a degree.

To see a Schedule of Classes, which lists classes available in a specific semester, along with the instructor of record, time and place the class is being held, go to UAConnect (https://uaconnect.uark.edu/).

How to Read a Course Description
Courses listed in this section describe all courses approved for offering by the University of Arkansas. The word “course” refers to a unit of academic instruction, while the word “class” refers to a course scheduled during a semester or summer session with a certain number of prescribed meetings each week. Successful completion of a class usually earns a specified number of semester hours of credit toward a degree.

The Schedule of Classes lists classes available in a specific semester, along with the instructor of record, time and place the class is being held.

Course Description Explanations
A course listing comprises the following elements, in order:

Course Prefix: This alpha descriptor is the first identifying part of a course. This four-letter code represents the course prefix name. Usually the course prefix will be the same as the department offering the course, but occasionally the prefix is one of many different courses offered in a single department. For example, ARAB refers to Arabic courses, which are offered through the Department of World Languages, Literatures and Cultures; HIST refers to History courses.

Course Number: Each course is designated by a four-digit number. The first digit identifies the level of the course: 1, freshman level; 2, sophomore level; 3 and 4, junior-senior level; 5, 6, and 7, graduate level. Any exceptions to this practice are stated in the course descriptions.

Students desiring admission to courses offered at levels beyond their standing should request the instructor’s permission to enroll. (For definitions of academic level see Student Classification (http://catalog.uark.edu/undergraduatecatalog/orientationandregistration/studentclassification/).)

The second and third digits of the number identify the course within the department that offers it.

The fourth digit identifies the semester-hour value of the course. Credit for certain courses does not count toward some degrees.

Normally, courses meet once each week for 50 minutes for each hour of course credit. Laboratory, drill and other kinds of activity courses typically meet for two 50-minute periods per week for each hour of credit.

The letter ‘V’ is used in place of the last digit for those courses in which credit is variable. The minimum and maximum credit hours possible are given in parentheses after the course title.

The letter ‘X’ is used in place of the last digit for those courses in which fixed credit is ten or more hours.

The first three digits of the number are the same for corequisite courses (for example, a lecture and the corequisite lab or drill).

Course Suffix: A suffix to the course number further identifies the specific type of instruction:

- C - Drill or Lab Component
- L - Laboratory
- H - Honors Course
- M - Honors Laboratory

A course with no suffix is a typical lecture course (not an honors course).

Course Title: The title of the course is printed in bold letters.

Course Semester Offering: Course descriptions include a notation of the semester in which the course is typically offered. Consult the Schedule of Classes to verify that a course is being offered for a given term.

Course Description: A brief description of the course content and its major emphasis are stated. If the course is cross-listed (also offered under another subject) a statement to that effect will be included in the description. Likewise, if the course is equivalent to another course (such as an honors and non-honors offering) a statement to that effect will also be included. If the course is eligible to be repeated for degree credit more than once, a statement will appear to indicate the total hours or times a course may be repeated. If no repeat statement is listed, the course may be used for degree credit only once.

Requisites: Requisites are requirements that must be fulfilled either before a course may be taken or at the same time a course is taken. It is the student’s responsibility to make sure the proper prerequisites have been completed before enrolling in any class. Prerequisites are courses or requirements that must be completed prior to enrolling in a certain course. Courses may have prerequisites from inside and outside the department. It is the student’s responsibility to make sure he/she has completed the proper prerequisites before enrolling in any class. Courses listed as corequisite are to be taken in the same semester as the course desired.

A course listed as a pre- or corequisite to another course means that it must be taken during the same semester as that course, unless it has been completed in a previous term.

Students may not enroll in courses for which they do not have the necessary prerequisites. Students who are in doubt concerning their eligibility to enroll in specific courses should consult with their academic adviser. Students may be dropped from courses for which they do not have the necessary prerequisites.

Courses of Instruction
By Subject
Accounting (ACCT) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/acct/)
Adult and Lifelong Learning (ADLL) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/adll/)
Advertising/Public Relations (ADPR) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/adpr/)
African and African American Studies (AAST) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/aast/)
English Language and Cultural Studies (ELAC) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/elas)
Entomology (ENTO) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/ento)
Environmental Dynamics (ENDY) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/endy)
Environmental Science (ENSC) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/ensc)
Ethnomusicology (MUSY) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/musy)
Exercise Science (EXSC) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/exsc)
Extension Education (EXED) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/exed)
Fay Jones Architecture and Design (FJAD) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/fjad)
Finance (FINN) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/finn)
Food Science (FDSC) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/fdsc)
French (FREN) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/fren)
Gender Studies (GNST) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/gnst)
General Engineering (GNEG) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/gneg)
Geosciences (GEOS) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/geos)
German (GERM) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/germ)
Graduate Education Courses (GRSD) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/grsd)
Graphic Design (GDES) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/gdes)
Greek (GREK) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/grek)
Health, Human Performance and Recreation (HHPR) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/hhpr)
Higher Education (HIED) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/hied)
History (HIST) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/hist)
Honors College (HNRC) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/hnrc)
Horticulture (HORT) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/hort)
Hospitality Management (HOSP) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/hosp)
Human Development and Family Sciences (HDFS) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/hdfs)
Human Environmental Sciences (HESC) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/hesc)
Human Resource and Workforce Development Education (HRWD) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/hrwd)
Humanities (HUMN) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/humn)
Industrial Engineering (INEG) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/ineg)
Information Systems (ISYS) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/isys)
Interdisciplinary Studies (IDST) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/idst)
Interior Design (IDES) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/ides)
International and Global Studies (INST) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/inst)
Italian (ITAL) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/ital)
Japanese (JAPN) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/japn)
Jewish Studies (JWST) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/jwst)
Journalism (JOUR) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/jour)
Kinesiology (KINS) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/kins)
Landscape Architecture (LARC) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/larc)
Latin American and Latino Studies (LALS) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/lals)
Latin (LATN) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/latn)
Law (LAWW) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/laww)
Management (MGMT) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/mgmt)
Marketing (MKTG) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/mktg)
Master of Business Administration (MBAD) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/mbad)
Materials Science and Engineering (MSEN) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/msen)
Mathematics (MATH) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/math)
Mechanical Engineering (MEEG) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/meeeg)
Medieval and Renaissance Studies (MRST) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/mrst)
Middle East Studies (MEST) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/mest)
Music Education (MUED) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/mued)
Music Ensemble (MUEN) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/muens)
Music History (MUHS) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/muhs)
Music Literature (MLIT) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/mlit)
Music (MUSC) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/musc)
Music Pedagogy (MUPD) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/mudp)
Music Theory (MUTH) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/muth/)
Nursing (NURS) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/nurs/)
Nutrition (NUTR) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/nutr/)
Operations Management (OMGT) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/omgt/)
Philosophy (PHIL) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/phil/)
Physical Education Activity (PEAC) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/peac/)
Physical Education (PHED) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/phed/)
Physics (PHYS) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/phys/)
Plant Pathology (PLPA) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/plpa/)
Plant Sciences (PTSC) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/ptsc/)
Political Science (PLSC) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/plsc/)
Portuguese (PORT) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/port/)
Poultry Science (POSC) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/posc/)
Psychology (PSYC) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/psy/)
Public Administration (PADM) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/padm/)
Public Health (PBHL) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/pbhl/)
Public Policy (PUBP) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/pubp/)
Recreation and Sport Management (RESM) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/resm/)
Rural Sociology (RSOC) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/rsoc/)
Russian (RUSS) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/russ/)
Secondary Education (SEED) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/seed/)
Social Work (SCWK) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/scwk/)
Sociology (SOCL) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/socl/)
Southern Studies (SOST) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/sost/)
Space and Planetary Sciences (SPAC) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/spac/)
Spanish (SPAN) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/span/)
Special Education (SPED) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/sped/)
Statistics and Analytics (STAN) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/stan/)
Statistics (STAT) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/stat/)
STEM Education for Early Childhood (STEM) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/stem/)
Supply Chain Management (SCMT) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/scmt/)
Sustainability (SUST) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/sust/)
Swahili (SWAH) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/swah/)
Technology Education (TEED) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/teed/)
Theatre (THTR) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/thtr/)
U A Clinton School (UACS) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/uacs/)
University Connections Program (UCPG) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/ucpg/)
University (UNIV) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/univ/)
Walton College of Business (WCOB) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/wcob/)
World Languages, Literatures and Cultures (WLLC) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/wllc/)
World Literature (WLIT) (http://catalog.uark.edu/undergraduatecatalog/coursesofinstruction/wlit/)

Courses

MSEN 488V. Materials Science and Engineering Undergraduate Research. 1-3 Hour.
Special research topics associated with undergraduates enrolled in the Materials Science and Engineering minor program, or by special permission of the MSEN Director to undergraduate students engaged in research with MSEN faculty members. (Typically offered: Fall and Spring) May be repeated for up to 9 hours of degree credit.

MSEN 5253. Emerging Technologies in Industry. 3 Hours.
Business leaders present technologies used by their companies. Focusing on Arkansas-based companies, technology needs for the industry and innovative ideas for solutions or advancements are discussed. Students work to develop solutions to address company needs or further develop a company’s current technology. (Typically offered: Fall and Spring) May be repeated for up to 9 hours of degree credit.

MSEN 5313. Fundamentals of Materials Science. 3 Hours.
Fundamentals of Materials Science provides an overview of materials science and engineering and is foundational for graduate study in the field. The structures of materials at the atomic scale, nanoscale, microscale, and macroscale are studied and the impact of this organization of matter on its physical and chemical properties are examined. Principles for measurement and characterization of material structure and properties are introduced. Emphasis is placed on materials important for use for electronic, photonic, energy, and biological applications. Advances in nanoscale materials as established fundamentals of macroscale structural materials are covered. Prerequisite: Graduate standing or consent of the instructor. (Typically offered: Fall)
MSEN 5322. Materials Characterization. 2 Hours.
Lecture and hands-on experience for using characterization tools to study the properties of materials. Techniques covered will include x-ray diffraction, x-ray photoelectron spectroscopy, scanning electron microscope, transmission electron microscope, and others. Use of these techniques for studies of material failure and reliability will also be examined. Corequisite: Lab component. Prerequisite: MSEN 5313 or instructor consent. (Typically offered: Fall)

MSEN 5383. Research Commercialization and Product Development. 3 Hours.
This survey course examines research commercialization through analysis of IP, technology space, market space, manufacturability, financials, and business plans. Entrepreneurial behaviors and product development within large companies are also discussed. A case study using a current UA faculty member’s research commercialization effort will be developed. Prerequisite: Graduate Standing. (Typically offered: Spring)

MSEN 5393. Product Development Process. 3 Hours.
Demonstration of a student’s technical and management knowledge integration by creating a commercially viable product development process to meet a new societal need, with the technical solution based on micro to nanoscale technology. Final grade based on a detailed written report and oral presentation to a panel. Non-thesis students only. Pre- or Corequisite: MSEN 5383. Prerequisite: Instructor permission. (Typically offered: Spring)

MSEN 5513. Applied Research in External Technical Organizations. 3 Hours.
A one semester narrow focus graduate level research effort while working at an external technical organization’s site. Requires a final report of style and quality suitable for journal submission. This course available only to Professional Path M.S. MSEN students, and may substitute for an MSEN 558V Internship. Prerequisite: Instructor consent. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

MSEN 5523. Applied On-Campus Collaborative Research with External Technical Organizations. 3 Hours.
A one semester narrow focus graduate level on-campus research effort performed in collaboration with an external technical organization. Requires a final report of style and quality suitable for journal submission. This course available only to Professional Path M.S. MSEN students. Prerequisite: Instructor consent. (Typically offered: Fall, Spring and Summer) May be repeated for up to 6 hours of degree credit.

MSEN 555V. Internship in External Technical Organization. 1-3 Hour.
Used to document a MSEN grad student internship experience in an external technical organization for a minimum duration of six weeks (6-9 weeks=one hour, 10-12 weeks=two hours, and 13-15 weeks=three hours). It may not be used to meet the research requirements of a M.S. degree. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer)

MSEN 5611. Research Communication Seminar of MS Students. 1 Hour.
This course serves as a forum for MS students to develop oral presentation skills and to exchange research ideas. Research presentations will be on various topics in the area of micro to nanoscale materials, processing, and devices, with research management and planning also being addressed. Prerequisite: Graduate standing. (Typically offered: Fall and Spring)

MSEN 5713. Advanced Nanomaterials Chemistry. 3 Hours.
Science and engineering graduates are using more nanomaterials, and modern industry demands that its scientists and engineers have materials chemistry knowledge. Materials from the micro to nanoscale will be examined in this course from the perspective of fundamental chemistry principles to build a picture of tomorrow’s materials. (Typically offered: Irregular) May be repeated for up to 3 hours of degree credit.

MSEN 5733L. Fabrication at the Nanoscale. 3 Hours.
This hands-on lab course will cover the disciplines needed to make active electronic and photonic devices utilizing nanoscale structures and fabrication techniques presently used in research and industry. Prerequisite: Graduate standing and permission of the instructor. (Typically offered: Spring)

MSEN 5811. 1st Year Operations Seminar - Infrastructure Management. 1 Hour.
Weekly seminar for 1st year Materials Science and Engineering graduate students to discuss issues that increase professional performance in technology-centered organizations. The discussions will focus on issues that affect organizational infrastructure, career planning, organizational structures, and may include examples from current events. Prerequisite: Graduate standing. (Typically offered: Fall)

MSEN 5821. Ethics for Scientists and Engineers. 1 Hour.
This course will introduce methods useful in the practice of ethical decision making in the high technology academic and industrial work place. An emphasis will be placed on applying the methods discussed in the text to student and instructor past professional experiences. Prerequisite: Graduate standing. (Typically offered: Summer)

MSEN 587V. Special Topics in Materials Science and Engineering. 1-4 Hour.
Consideration of current materials science and engineering topics not covered in other courses. One section will be created for each topic only after a syllabus is submitted to the MSEN office by the faculty member teaching the course. (Typically offered: Irregular) May be repeated for up to 9 hours of degree credit.

MSEN 588V. Special Problems in Materials Science and Engineering. 1-3 Hour.
Opportunity for individual study of advanced subjects related to a graduate degree in Materials Science and Engineering to suit individual requirements. One section will be created for each student only after a syllabus is submitted to the MSEN office by the supervising faculty member. (Typically offered: Irregular) May be repeated for up to 6 hours of degree credit.

MSEN 5911. 1st Year Operations Seminar - Personnel Management. 1 Hour.
Weekly seminar for 1st year Materials Science and Engineering graduate students to discuss issues that increase professional performance in technology-centered organizations. The discussions will focus on issues that affect personnel management, team building and structures, and may include examples from current events. Prerequisite: Graduate standing. (Typically offered: Spring)

MSEN 600V. Master’s Thesis. 1-6 Hour.
Master’s Thesis. Prerequisite: Graduate standing. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.

MSEN 626V. Emerging Technologies in Industry Practicum. 1-3 Hour.
Students engage in demand-driven research projects inspired by Arkansas companies as part of the interdisciplinary IGNITE (Industry Generating New Ideas and Technology through Education) program. These projects, which often result from interactions with companies during MSEN 5253, include visiting company locations; developing project goals, budgets, and timelines; and performing research. (Typically offered: Fall, Spring and Summer) May be repeated for up to 9 hours of degree credit.

MSEN 6313. Advanced Materials Science and Engineering. 3 Hours.
This course will introduce students to the core principles of the design, nature and processing of advanced materials and the mechanisms of failure of materials. The course also integrates materials behavior and materials processing relevant to a wide range of industrial sectors while it covers traditional structural materials, functional materials, nanomaterials and biomaterials. Students learn to achieve enhanced functionality through convergence and integration of biological, organic, electronic, and structural materials; self-assembly creation of new materials; and tailoring of interfaces to produce nanocomposites. In this way, it will provide students with a depth of core knowledge and skills allowing students to make informed choices concerning applications, selection and design of advanced materials. Prerequisite: MSEN 5313 or permission of the Instructor. (Typically offered: Spring)
MSEN 6323. Materials Engineering Design. 3 Hours.
This course will provide concrete training on the generation of a sound prototype design and R&D plan, in addition to the generation of a quality proposal based on specific federal solicitation criteria. Finally, each student will pick a topic/prototype for which they will prepare a full preliminary design, R&D plan and federal grant proposal from a list of real, suitable topics. The students will be required to follow the specific topic/solicitation instructions provided by the federal agency supporting the research. Prerequisite: Graduate standing or consent of the instructor. (Typically offered: Fall)

MSEN 6611. Research Communication Seminar of PhD Students. 1 Hour.
This course serves as a forum for Ph.D. students to develop oral presentation skills and to exchange research ideas. Research presentations will be on various topics in the area of materials, processing, and devices, with research management and planning also being addressed. Prerequisite: Graduate standing. (Typically offered: Fall and Spring)

MSEN 6811. 2nd Year Operations Seminar - Management and Leadership. 1 Hour.
Weekly seminar for 2nd year Materials Science and Engineering graduate students to discuss issues that increase professional performance in technology-centered organizations. The discussions will focus on issues that affect management and leadership effectiveness and efficiency, and may include examples from current events. Prerequisite: Graduate standing. (Typically offered: Fall)

MSEN 6911. 2nd Year Operations Seminar - Advanced Management and Leadership. 1 Hour.
Weekly seminar for 2nd year Materials Science and Engineering graduate students to discuss advanced issues that increase professional performance in technology-centered organizations. The discussions will focus on the complex issues that affect management and leadership effectiveness and efficiency, and may include examples from current events. Prerequisite: Graduate standing. (Typically offered: Spring)

MSEN 700V. Doctoral Dissertation. 1-21 Hour.
Doctoral dissertation. (Typically offered: Fall, Spring and Summer) May be repeated for degree credit.