



BACHELOR OF SCIENCE
in
MATERIALS SCIENCE & ENGINEERING

a guide to the undergraduate degree program



**School of Materials Engineering
Purdue University**

- -

**Last Updated
September 8, 2022**

You Can't Make It Without Materials



INTRODUCTION

The purpose of this manual is to provide one source to address most of the questions that arise on a regular basis regarding policies and procedures in the School of Materials Engineering. The first section outlines the procedures needed to develop and implement your Plan of Study, ranging from the proposed sequence in which you take your courses to how you may petition for exceptions from standard procedures and requirements. The second section summarizes opportunities available to you beyond the standard curriculum including the Co-Op program, Student Societies, Study Abroad, Independent Research and our Honors program. While your coursework is very important, your experiences and the people you meet outside of the classroom by doing research, participating in student society activities or spending a semester in another country will have a major influence on how you think, and the career path that you choose. You are encouraged to take advantage of these opportunities.

Sincerely,

David Johnson, Undergraduate Committee Chair

Members of Undergraduate Committee: Prof. Kendra Erk, Prof. David Gildemeister, Prof. Matthew Krane, Prof. Eric Kvam, Prof. Elliott Slamovich, Prof. Robert Spitzer, and Rosemary Son (Academic Advisor for MSE).

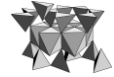
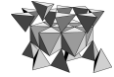


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SECTION 1. PROCEDURES AND POLICIES

1.1. ACADEMIC AND PROFESSIONAL CONDUCT

1.1.1. Academic Dishonesty

The Purdue University Student Conduct Code is detailed in Section III-B of the Purdue University Regulations. The complete Conduct Code is available on the Office of the Dean of Students webpage. Section III-B-2 outlines misconduct subject to disciplinary penalties, and Section III-B-2a reproduced below defines academic dishonesty:

“... Cheating, plagiarism, or knowingly furnishing false information to the University are examples of dishonesty. The commitment of the acts of cheating, lying, stealing, and deceit in any of their diverse forms (such as the use of ghost-written papers, the use of substitutes for taking examinations, the use of illegal cribs, plagiarism, and copying during examinations) is dishonest and must not be tolerated. Moreover, knowingly to aid and abet, directly or indirectly, other parties in committing dishonest acts is in itself dishonest”.

Given the availability of material on the web, plagiarism on writing assignments is a particular problem, in part because most students do not understand what constitutes plagiarism. A good resource is the series of articles entitled “Avoiding Plagiarism” hosted on the Purdue Online Writing Lab (OWL): https://owl.purdue.edu/owl/purdue_owl.html

1.1.2. Engineering Professional Ethics

Since most of you will be practicing Engineers in a few years you should become familiar with Engineering Ethics. The Code below was adopted by the Accreditation Board for Engineering and Technology in 1977 and is posted on our website.

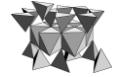
Engineers uphold and advance the integrity, honor and dignity of the engineering profession by:

- I. using their knowledge and skill for the enhancement of human welfare;
- II. being honest and impartial, and servicing with fidelity the public, their employers and clients;
- III. striving to increase the competence and prestige of the engineering profession; and
- IV. supporting the professional and technical societies of their disciplines.

The Fundamental Canons

1. Engineers shall hold paramount the safety, health and welfare of the public in the performance of their professional duties.
2. Engineers shall perform services only in the areas of their competence.
3. Engineers shall issue public statements only in an objective and truthful manner.
4. Engineers shall act in professional matters for each employer or client as faithful agents or trustees, and shall avoid conflicts of interest.
5. Engineers shall build their professional reputation on the merit of their services and shall not compete unfairly with others.
6. Engineers shall act in such a manner as to uphold and enhance the honor, integrity and dignity of the profession.
7. Engineers shall continue their professional development throughout their careers and shall provide opportunities for the professional development of those engineers under their supervision.

Other engineering societies have their own ethical codes. An excellent resource to learn more about engineering ethics is the website onlineethics.org.



1.2. UNDERGRADUATE DEGREE PROGRAM REQUIREMENTS

The degree requirements for a B.S. MSE from the School of Materials Engineering at Purdue University are summarized below. The following sections will take you through the process of assembling your Plan of Study to satisfy the degree requirements.

Minimum Degree Requirements for Materials Engineering (B.S.MSE)

1. Satisfy the requirements of the First Year Engineering program.
2. Satisfy the Core course sequence in Engineering, Mathematics, and Physical Sciences.
3. Satisfy the College of Engineering General Education Program (24 credit hours). This requirement has two components:
 - Foundation Learning Outcomes: select from courses approved by the Undergraduate Curriculum Council for the pertinent learning outcomes.
 - Programmatic Requirement: select from courses approved as approved by the School of Materials Engineering.
4. Have at least 18 credit hours of Technical Electives, at least 12 of which are Materials-specific, as designated by the School of Materials Engineering.
5. Have at least 125 credits total.
6. Minimum average GPA of 2.0 in MSE 200 and 300 level courses.

GPA Requirements

In addition to satisfying all of the curriculum requirements and having a Graduation Index of at least 2.0, graduation with a B.S.MSE degree also requires an average GPA of at least 2.00 for all 200- and 300-level MSE courses.

Pass/Not-Pass Option

Of the courses used to satisfy the minimum graduation requirements, the pass/not-pass option may be applied only to General Education courses.

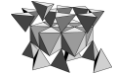
Exception to Normal Published Requirements

Exception to any and all normal published requirements for graduation requires approval by petition to the Undergraduate Committee of the School of Materials Engineering. The process for petitioning is described in section 1.6.

Transfer Credit

All students transferring into the School of Materials Engineering, whether from another university or another program within Purdue, are required to meet with the MSE Academic Program Administrator to plan their petition for transferring credit and to develop a Plan of Study.

Students may also transfer credit earned from other universities during the summer or from universities attended during Study Abroad. It is best to seek prior approval for transfer credit under these circumstances because a petition may be required (section 1.6). Approval for courses that count towards the Foundational Learning Outcomes (section 1.4.3.1) is made at the University level and not by the School of Materials Engineering.



**Minimum Degree Requirements
For Materials Engineering**

Credit Hours Required for Graduation: 125

<i>Courses</i>	<i>Credit Hours</i>
Mathematics and Physical Sciences	
Calculus: MA 16500, 16600, 26100, 26500, and 26600	18
Chemistry: CHM 11500, 11600	8
Physics: PHYS 17200, 24100, 25200	8

General Education Program

Foundational Learning Outcomes:

(Courses approved by the Undergraduate Curriculum Council)

Written Communication/Information Literacy	3
Oral Communication	3
Humanities	3
Behavior/Social Science	3
Science, Technology, & Society	3
General Education Electives:	9

Electives are selected from approved lists with MSE faculty guidance subject to the programmatic requirements of the College of Engineering General Education Program.

Seminars

MSE 39000 (semesters 3-8)	0
---------------------------	----------

Core Engineering Courses

ENGR 13100, 13200 or ENGR 14100 and 14200	4
MSE Core: 23000, 23500, 25000, 26000, 27000, 33000, 33500, 34000, 36700, 37000, 38200, 42000, 43000, 44000 and 44500.	45
Integrated MSE courses, including year-long, industry-sponsored senior design projects, on the structure, properties, processing, and performance of engineering materials.	

Technical Electives	18
----------------------------	-----------

A plan of study is designed with the help of a faculty advisor to meet each individual student's professional goals. At least 12 of the 18 credits must be approved materials-specific courses; the remaining 6 credits may be selected from an approved list of courses, including other academic disciplines.

1.3. MSE PROGRAM ACCREDITATION

The degree program offered through the School of Materials Engineering is accredited by ABET, Inc., an organization that uses a peer review process to ensure educational quality. Quoting from their website: “ABET accreditation is assurance that a college or university program meets the quality standards established by the profession for which it prepares its students.” Accreditation is voluntary, and all of Purdue’s Engineering programs are ABET accredited. This means that the MSE program (along with all of the Purdue Engineering programs) is reviewed every six years to determine if the established criteria for accreditation are met. There are eight criteria that must be satisfied for accreditation, below are brief descriptions of Criteria 2 and 3 that have the greatest impact on your undergraduate curriculum.

1.3.1. Criterion 2. Program Educational Objectives

Program Education Objectives are: “broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve.” These Objectives are listed in the following text.

The degree program in Materials Engineering will provide the educational experiences to produce graduates with the knowledge and skills to excel in materials science and engineering related positions or to pursue graduate study. Within a few years after graduating, our students will:

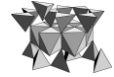
1. Be successful in top graduate schools and in professional positions within industry and commerce.
2. Contribute their Materials Engineering expertise effectively as members of engineering teams.
3. Demonstrate lifelong learning and engagement through continued professional development, and participation and leadership in professional societies and organizations.

Our success in achieving these Objectives is evaluated primarily by surveying our alumni. We also receive input from our Advisory Committee consisting of individuals in business, industry and academia, and from you during your senior exit surveys and interviews. We use the input to help make decisions about curriculum changes that would better achieve our Objectives.

1.3.2. Criterion 3. Program Outcomes and Assessment

Program outcomes describe the skill set students are expected to possess by the time of graduation. Program outcomes must facilitate attainment of the program education objectives described above. Graduates of the Undergraduate program in the School of Materials Engineering at Purdue University will have:

1. an ability to identify, formulate, and solve complex materials engineering problems by applying principles of engineering, science, and mathematics.
2. an ability to apply engineering design to produce materials engineering solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental, and economic factors.
3. an ability to communicate effectively with a range of audiences.



4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. an ability to develop and conduct appropriate experimentation in materials engineering, analyze and interpret data, and use engineering judgment to draw conclusions.
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

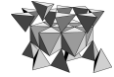
To maintain accreditation, our curriculum must produce these outcomes, and an assessment process must be in place to measure the program's success in achieving its program outcomes. The assessment process must be designed to indicate the degree to which the program outcomes are achieved, and the assessment process must be used to develop the program through the exposure of program weaknesses and subsequent addressing of identified weaknesses. The assessment process generally includes evaluation of student work including exam performance, laboratory reports, individual and group written assignments and oral presentations, and results from student and alumni surveys.

1.4. Components of the Materials Engineering Degree Program

Links to all of the courses described below may be found in the Purdue Course Catalog, and a version of the content below with active links is available in the Undergraduate section of the MSE website. The major components of the MSE degree program are described below and summarized graphically in Figure 1.1.

1.4.1. Mathematics and Physical Sciences

A firm grasp of mathematics, chemistry and physics facilitates understanding the concepts presented in your Engineering Core Courses. Mathematics courses include Analytical Geometry and Calculus (MA 16500 and MA 16600), Multivariate Calculus (MA 26100), Linear Algebra (MA 26500) and Ordinary Differential Equations (MA 26600). Chemistry courses consist of two semesters of General Chemistry (CHM 11500 and 11600). Physics courses cover Mechanics (PHYS 17200), and Electricity and Optics (PHYS 24100 and PHYS 25200 or PHYS 27200).



Materials Engineering
College of Engineering

Name	_____
Student ID	_____
Email	_____

125 Credits for Graduation
Students must have a graduation index of 2.0
Student must have a minimum average GPA of 2.0 in MSE 200 and 300 level courses.

Materials Engineering Major Courses (45 credits)

Required MSE Courses (45 credits)

- | | |
|--|--|
| ____ (3) MSE 23000- Structure and Prop. of Materials | |
| ____ (3) MSE 23500 – Materials Properties Lab | ____ (3) MSE 36700 – Materials Processing Lab |
| ____ (3) MSE 25000- Physical Properties in Eng. | ____ (3) MSE 37000 – Elec. Opt, Mag Props. of Materials |
| ____ (3) MSE 26000- Thermodynamics of Materials | ____ (3) MSE 38200 - Mechanical Response of Materials |
| ____ (3) MSE 27000- Bonding and Crystallography | ____ (0) MSE 39000 – Seminar (taken each semester) |
| ____ (3) MSE 33000 – Proc. and Props. of Materials | ____ (3) MSE 42000 – Struct. & Props. of Organic Materials |
| ____ (3) MSE 33500 – Material Characterization Lab | ____ (3) MSE 43000 – Materials Processing and Design I |
| ____ (3) MSE 34000 – Transport Phenomena | ____ (3) MSE 44000 – Materials Processing And Design II |
| | ____ (3) MSE 44500 – Materials Engr Systems Analysis |

MSE technical Electives (18 credits) *(See the MSE undergraduate manual for an approved list)*

- | | |
|----------------------------------|---|
| _____ (3) Technical Elective I | _____ (3) Technical Elective IV |
| _____ (3) Technical Elective II | _____ (3) Technical Elective V or Support Area Elective I |
| _____ (3) Technical Elective III | _____ (3) Technical Elective VI or Support Area Elective II |

Other Departmental /Program Course Requirements (62 credits)

General Engineering Requirements (4 credits)

- ____ (2) ENGR 13100/14100 (honors) - Transforming Ideas to Innovation I
____ (2) ENGR 13200/14200 (honors)- Transforming Ideas to Innovation II

Mathematics Requirements (18 credits).

- | | |
|--|---|
| ____ (4/5) MA 16500/16100 - Analytic Geometry And Calculus I (satisfies Quantitative Reasoning Selective for | |
| ____ (4/5) MA 16600/16200 - Analytic Geometry And | ____ (3) MA 26500 - Linear Algebra |
| ____ (4) MA 26100 - Multivariate Calculus | ____ (3) MA 26600 - Ordinary Differential |
- Alternative sequence to MA 265/266 is MA 26200 followed by either MA 30300 or MA 35100

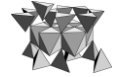
Science Requirements (16 credits)

- ____ (4) CHM 11500/13600 (honors) - General Chemistry I (satisfies Science Selective for core)
____ (4) CHM 11600/13600 (honors) – General Chemistry II
____ (4) PHYS 17200 – Modern Mechanics (satisfies Science Selective for core)
____ (3/4) PHYS 24100/27200- Electricity and Optics (1) PHYS 25200 - Elec. And Optics Lab
PHYS 25200 may be replaced by another 1-cr hour science laboratory
PHYS 27200 replaces both PHYS 24100 & PHYS 25200

MSE General Education Requirement (24)

- Foundation Core (<http://www.purdue.edu/provost/initiatives/curriculum/course.html>)
____ (4/3) Course that satisfies Information Literacy and Written Communications Selectives (e.g., ENGL 10600)
____ (3) Course that satisfies Oral Communication for University Core (for example COM 11400)
____ (3) G.E. I – (satisfies Human Cultures Humanities for core)
____ (3) G.E. II – (satisfies Human Culture Behavioral/Social Science for core)
____ (3) G.E. III – (satisfies Science, Technology & Society Selective for core)
MSE General Education Electives (See the MSE undergraduate manual for an approved list)
____ (3) G.E IV _____ (3) G.E. V _____ (3)G.E. VI

Figure 1.1: Summary of the MSE degree program courses.



1.4.2. Materials Engineering Core Courses

The core MSE sequence begins with a general introduction into the Structure and Properties of Materials (MSE 23000) and a laboratory course investigating the properties of materials (MSE 23500). The second semester of the sophomore year sets a foundation of MSE fundamentals covering mechanics (MSE 25000); thermodynamics (MSE 26000), bonding, crystallography and statistical mechanics (MSE 27000). The junior year has the highest concentration of materials courses covering Transport Phenomena (MSE 34000), Electrical, Optical and Magnetic Properties of Materials (MSE 37000), the Mechanical Response of Materials (MSE 38200), Properties and Processing of Materials (MSE 33000), and the Structure and Properties of Organic Materials (MSE 42000). The junior year also features two laboratory courses, the first emphasizing Materials Characterization Methods (MSE 33500) while the second focuses on Materials Processing (MSE 36700). The senior design sequence (MSE 43000 and 44000) includes a yearlong group project in which students choose from a variety of industry-sponsored design projects. Senior design is complemented by Materials Engineering Systems Analysis (MSE 44500), that increases the representation of design elements in the curriculum. Every semester you are expected to participate in the Materials Engineering Seminar (MSE 39000). Activities in MSE 39000 include alumni and other visitors from industry discussing career opportunities, professional development, networking, and other outreach activities and social events.

1.4.3. College of Engineering General Education Program

Students must satisfy the College of Engineering General Education Program. This requirement has two components: Foundation Learning Outcomes and MSE Programmatic Requirements. For the *combined set* of classes (sections 1.4.3.1 and 1.4.3.2) the following requirements apply:

- Students must earn a C- or better in courses that satisfy Foundational Learning Outcomes.
- At least six credit hours must be at the 30000 level or above, or from courses with a required prerequisite in the same department.
- No more than 6 credit hours from the Colleges of Engineering, Science, and Technology.

1.4.3.1 Foundational Learning Outcomes

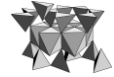
Students must select from a list of courses maintained by the Office of the Provost as part of Purdue's Undergraduate Outcomes-based Core Curriculum to satisfy the all six Foundational Learning Outcomes. These are listed below and described at:

<http://www.purdue.edu/provost/students/s-initiatives/curriculum/coreCurriculum.html>

- 1) Written Communication Foundational Outcome course taken during FYE.
- 2) Information Literacy taken during FYE.
- 3) Oral Communication Foundational Outcome course taken during FYE.
- 4) Humanities (3 credit hours, MSE requirement)
- 5) Behavior/Social Science (3 credit hours, MSE requirement)
- 6) Science, Technology, & Society (3 credit hours, MSE requirement)

During the First-Year Engineering (FYE) program the first 3 Foundational Learning Outcomes are satisfied. To satisfy the remaining Foundational Learning Outcomes, students in MSE are required to take 3 credit hours from Humanities, Behavior/Social Science, and Science, Technology, & Society. A list of these approved courses is maintained at:

<http://www.purdue.edu/provost/initiatives/curriculum/course.html>



1.4.3.2 MSE Programmatic Requirements (9 credit hours)

A summary of the General Education Program for the School of Materials Engineering along with a list of approved courses is provided below. The faculty view courses in the arts, humanities and social science as an integral part of one's Engineering Education. The rationale for this view is described in the preamble to the General Education Program stating:

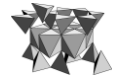
"Humanities and social sciences courses encompass the breadth of human experience and culture, both past and present, including individual behavior, social and political structures, aesthetic values, modes and dynamics of communication, philosophical and ethical thought, and cognitive processes. Such courses are an integral part of all engineering curricula which complements technical and professional content by enabling engineering students to appreciate the world in which they live and work, and to contribute as both educated members of society and aware, ethical professionals. Humanities and social sciences courses also provide a framework for rational inquiry, critical evaluation, judgment and decisions when dealing with issues that are non-quantifiable, ambiguous, or controversial. Of equal importance, they offer opportunities for engineering students to develop interests and insights that guide, enrich and expand their personal lives." You are encouraged to make the most of this program by taking courses that are both interesting and challenging.

MSE General Education Courses

A. College of Liberal Arts

Introductory

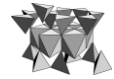
- African American Studies (AAS) 10000-29999
- Art & Design (AD) 10000-29999
- American Studies (AMST) 10000-29999
- ANTH 10000 - Being Human: Introduction To Anthropology
- ANTH 20100 - Introduction To Archaeology And World Prehistory
- ANTH 20300 - Biological Bases Of Human Social Behavior
- ANTH 20400 - Human Origins
- ANTH 20500 - Human Cultural Diversity
- Arabic (ARAB) 10000-29999
- Asian American Studies (ASAM) 10000-29999
- Asian Studies (ASIA) 10000-29999
- American Sign Language (ASL) 10000-29999
- CDIS 23900 - Introduction To Disability Studies
- Chinese (CHNS) 10000-29999
- Classics (CLCS) 10000-29999
- Comparative Literature (CMPL) 10000-29999
- Dance (DANC) 10000-29999
- French (FR) 10000-29999
- Film and Video Studies (FVS) 10000-29999
- German (GER) 10000-29999
- Greek (GREK) 10000-29999
- Global Studies Liberal Arts (GSLA) 10000-29999
- Hebrew (HEBR) 10000-29999
- History (HIST) 1000-29999
- Italian (ITAL) 10000-29999
- Japanese (JPNS) 10000-29999



- Jewish Studies (JWST) 10000-29999
- Latin American and Latino Studies (LALS) 10000-29999
- Latin (LATN) 10000-29999
- Languages & Cultures (LC) 10000-29999
- Linguistics (LING) 10000-29999
- Medieval and Renaissance Studies (MARS) 10000-29999
- Music (MUS) 10000-59900
- POL 23000 - Introduction To The Study Of Peace
- Portuguese (PTGS) 10000-29999
- Religious Studies (REL) 10000-29999
- Russian (RUSS) 10000-29999
- SOC 10000 - Introductory Sociology
- SOC 22000 - Social Problems
- Spanish (SPNS) 10000-29999
- Theatre (THTR) 10000-29999
- Women's Gender, and Sexuality Studies (WGSS) 10000-29999

Non-Introductory

- African American Studies (AAS) 30000-59999
- Art & Design (AD) 30000-59999
- American Studies (AMST) 30000-59999
- ANTH 31200 - The Archaeology Of Ancient Egypt And The Near East
- ANTH 32000 - Ancient States And Empires
- ANTH 33500 - Primate Behavior
- ANTH 33600 - Human Variation
- ANTH 34100 - Culture And Personality
- ANTH 36800 - Sociolinguistic Study Of African American English
- ANTH 37900 - Native American Cultures
- ANTH 39000 - Individual Research In Anthropology
- ANTH 39200 - Selected Topics In Anthropology
- ANTH 40400 - Comparative Social Organization
- ANTH 41400 - Introduction To Language And Culture
- ANTH 42500 - Archaeological Method And Theory
- ANTH 43600 - Human Evolution
- ANTH 46000 - Contemporary Issues In Agriculture
- Arabic (ARAB) 30000-59999
- Asian American Studies (ASAM) 30000-59999
- Asian Studies (ASIA) 30000-59999
- American Sign Language (ASL) 30000-59999
- Chinese (CHNS) 30000-59999
- Classics (CLCS) 30000-59999
- Comparative Literature (CMPL) 30000-59999
- Dance (DANC) 30000-59999
- French (FR) 30000-59999
- Film and Video Studies (FVS) 30000-59999
- German (GER) 30000-59999
- Greek (GREK) 30000-59999
- Global Studies Liberal Arts (GSLA) 30000-59999



- Hebrew (HEBR) 30000-59999
- History (HIST) 3000-59999
- Italian (ITAL) 30000-59999
- Japanese (JPNS) 30000-59999
- Jewish Studies (JWST) 30000-59999
- Latin American and Latino Studies (LALS) 30000-59999
- Latin (LATN) 30000-59999
- Languages & Cultures (LC) 30000-59999
- Linguistics (LING) 30000-59999
- Medieval and Renaissance Studies (MARS) 10000-29999
- Music (MUS) 30000-59999
- Portuguese (PTGS) 30000-59999
- Religious Studies (REL) 30000-59999
- Russian (RUSS) 30000-59999
- SOC 31000 - Race And Ethnicity
- SOC 31200 - American Society
- SOC 31600 - Industry And Society
- SOC 32400 - Criminology
- SOC 32800 - Criminal Justice
- SOC 33400 - Urban Sociology
- SOC 33800 - Global Social Movements
- SOC 35000 - Sociology Of Family
- SOC 36700 - Religion In America
- SOC 33900 - Sociology Of Global Development
- SOC 34000 - General Social Psychology
- SOC 34100 - Culture And Personality
- SOC 36800 - The Social Significance Of Religion
- SOC 37400 - Medical Sociology
- SOC 39100 - Selected Topics In Sociology
- SOC 40200 - Sociological Theory
- SOC 41100 - Social Inequality
- SOC 42100 - Juvenile Delinquency
- SOC 42600 - Social Deviance And Control
- SOC 42900 - Sociology Of Protest
- SOC 45000 - Gender Roles In Modern Society
- SOC 45400 - Family Violence
- SOC 49300 - Interdisciplinary Undergraduate Seminar
- Spanish (SPNS) 30000-59999
- Theatre (THTR) 30000-59999
- Women's Gender, and Sexuality Studies (WGSS) 30000-59999

B. College of Health and Human Sciences

Introductory

- HDFS 20100 - Introduction To Family Processes
- HDFS 21000 - Introduction To Human Development
- PSY 12000 - Elementary Psychology
- SLHS 11500 - Introduction To Communicative Disorders



- SLHS 22700 - Elements Of Linguistics

Non-Introductory

- CSR 34200 - Personal Finance
- CSR 39800 - International Special Topics
- HDFS 31100 - Child Development
- HDFS 31200 - Adult Development
- HDFS 32500 - Health And Health Care For Children And Families
- HDFS 33000 - Sexuality And Family Life
- HDFS 34100 - Working With Parents
- PSY 20000 - Introduction To Cognitive Psychology
- PSY 23500 - Child Psychology
- PSY 23900 - The Psychology Of Women
- PSY 24000 - Introduction To Social Psychology
- PSY 27200 - Introduction To Industrial-Organizational Psychology
- PSY 31000 - Sensory And Perceptual Processes
- PSY 31100 - Human Memory
- PSY 31400 - Introduction To Learning
- PSY 33500 - Stereotyping And Prejudice
- PSY 33600 - Issues In Developmental Psychology
- PSY 33700 - Social Cognition
- PSY 35000 - Abnormal Psychology
- PSY 36100 - Human Development I: Infancy And Childhood
- PSY 38000 - Behavior Change Methods
- PSY 39100 - Readings In Psychology
- PSY 39200 - Special Topics In Psychology
- PSY 42600 - Language Development
- PSY 42800 - Drugs And Behavior
- PSY 44300 - Aggression And Violence
- PSY 46400 - Research Ethics In Psychological Sciences
- PSY 47300 - Selection And Performance Appraisal In Organizations
- PSY 47500 - Work Motivation And Job Satisfaction
- PSY 48400 - The Psychology Of Consciousness
- SLHS 30900 - Language Development
- SLHS 40100 - Language And The Brain
- SLHS 41900 - Topics In Audiology And Speech Pathology

C. College of Agriculture

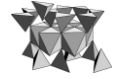
Introductory

- AGEC 25000 - Economic Geography Of World Food And Resources
- AGEC 29600 - Selected Topics In Agricultural Economics

Non-Introductory

- AGEC 34000 - International Economic Development
- AGEC 40600 - Natural Resource And Environmental Economics
- AGEC 41000 - Agricultural Policy
- AGEC 45000 - International Agricultural Trade

D. Polytechnic Institute - Division of Military Science and Technology



Introductory

- NS 21400 - Naval Leadership And Management

Non-Introductory

- AFT 35100 - Leading People And Effective Communication I
- AFT 36100 - Leading People And Effective Communication II
- AFT 47100 - National Security/Commissioning Preparation I
- AFT 48100 - National Security/Commissioning Preparation II
- NS 41300 - Naval Leadership And Ethics

E. Office of the Provost - Purdue Systems Collaboratory

Non-Introductory

- SYS 30000 - It's A Complex World - Addressing Global Challenges
- SYS 35000 - Systems Methods
- SYS 40000 - Systems Praxis

F. School of Management

Introductory

- ECON 25100 - Microeconomics
- ECON 25200 - Macroeconomics

Non-Introductory

- ECON 34000 - Intermediate Microeconomic Theory
- ECON 35200 - Intermediate Macroeconomics
- ECON 36100 - Antitrust And Regulation
- ECON 36500 - History Of Economic Thought
- ECON 37000 - International Trade
- ECON 37500 - United States Economic History
- ECON 38000 - Money And Banking
- ECON 38500 - Labor Economics
- ECON 42200 - Public Finance And Taxation
- ECON 45600 - Urban Economics
- ECON 46100 - Industrial Organization
- ECON 46600 - International Economics
- ECON 47100 - Behavioral Economics

1.4.4. Technical Electives

Eighteen credit hours of Technical Electives must be selected from lists of courses approved by the faculty of the School of Materials Engineering. At least 12 of the 18 credit hours are to be selected from the approved list of materials-related courses below. Up to 6 credit hours can be chosen from the list of Support Area Electives. You are encouraged to develop a theme in your Technical Elective Program based on your career interests, whether you intend to take a position in industry or continue your studies as a graduate student. If you would like help developing your Technical Elective Program this please feel free to consult your faculty advisor.

Approved Technical Elective courses are listed below. Detailed descriptions of MSE courses are available in the Undergraduate section of the MSE website. Most of these courses are not offered in a given semester. Therefore, each semester before registration a link to the Approved Technical Electives list is available in the Undergraduate section of the MSE website. This list



highlights the courses offered during the next semester and their descriptions, and courses tentatively planned for the semester after. The list of courses offered in a given semester and their descriptions is also available outside the office of the MSE Academic Program Administrator (Vicki Cline). The faculty instructors for technical electives present an outline of their courses in MSE 390 a week or two before registration.

Descriptions of courses in other departments may be found on their respective web pages or the Purdue University Course catalog. The list below is revised periodically by the MSE faculty. *Other courses may be acceptable, subject to approval by petition to the Undergraduate Committee (see section 1.6).*

APPROVED TECHNICAL ELECTIVES

MSE COURSES

MSE 49700	Selected topics in Materials Engineering Electronics Packaging and Heterogeneous Integration (Prereq: Junior standing)
MSE 49900	Independent Research (Prerequisites: approval from instructor)
MSE 50200	Defects in Solids (Prerequisites: Senior standing)
MSE 50500	Modeling and Simulation of Materials Processing (Prereq: MSE 34000 or ME 31500)
MSE 50800	Phase Transformation in Solids (Prerequisites: Junior standing)
MSE 51000	Microstructural Characterization Techniques (Prerequisites: Senior standing)
MSE 51200	Powder Processing (Co-requisites MSE 33000)
MSE 51800	Failure Analysis (Prerequisites: MSE 38200)
MSE 52300	Physical Ceramics (Prerequisites: Senior standing)
MSE 52400	Mechanical Behavior of Polymers (Prerequisites: MSE 38200)
MSE 52500	Structure, Prop Relationships of Engineering Polymers (Prerequisites: MSE 26000, MSE 34000, MSE 42000)
MSE 52700	Introduction to Biomaterials (Prerequisites: Sophomore 60+ credits)
MSE 53100	Quantitative Analysis of Microstructure (Prerequisites: Junior 74+ credits)
MSE 53600	Solidification of Casting (Co-requisites: MSE 33000)
MSE 54700	Introduction to Surface Science (Prerequisites: Senior standing)
MSE 54800	Deposition Processing of Thin Films and Coatings (Co-requisites: MSE 33000)
MSE 55000	Properties of Solids (Prerequisites: Senior standing)
MSE 55500	Deformation Mechanisms in Crystalline Solids (Prerequisites: MSE 38200)
MSE 55600	Fracture of Materials (Prerequisites: MSE 38200)
MSE 55900	Phase Equilibria in Multicomponent Systems (Prereq: Junior standing and MSE 26000)
MSE 56000	Production of Inorganic Materials (Prerequisites: Senior standing)
MSE 56200	Soft Materials (Prerequisites: MSE 42000)
MSE 56700	Polymer Synthesis (Prerequisites: MSE 42000 or Junior 74+ credits)
MSE 57500	Transport Phenomena in Solids (Prerequisites: Senior standing)
MSE 57600	Corrosion (Prerequisites: Junior standing)
MSE 58600	Experimental Characterization of Advanced Composite Materials (Senior standing)
MSE 58900	Archeology & Materials Science (Prerequisites Junior standing)

MSE 59700

Selected topics in Materials Engineering:

(Prerequisites: Senior standing unless otherwise noted)

- Deformation Processing (co-MSE 330)
- Steel & Al: Processing & Properties (co-MSE 330)
- Hypersonic Materials (co-MSE 330)
- Lean Manufacturing
- Sports Technology & Entrepreneurship
- Kinetics of Materials



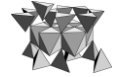
- Dynamic Mechanical Properties
- Dislocation Dynamics
- Materials in Extreme Environments
- Design Global Sustainability
- Design Global Sustainability II
- Solid State Materials
- Intro to Materials Science of Rechargeable Batteries
- Intro to Computational Material Science
- Modeling & Simulation of Materials
- Magnetic Materials Nano Fundamentals & Applications
- Additive Mfgr of Materials

APPROVED COURSES IN OTHER DEPARTMENTS

AAE 55200	Nondestructive Evaluation of Structures & Materials
AAE 55300	Elasticity in Aerospace Engineering
AAE 55400	Fatigue of Structures & Materials
AAE 55500	Mechanics of Composite Materials
CHE 44200	Chemistry & Engineering of High Polymers
CHE 54300	Polymerization Reaction Engineering and Reactor Analysis
CHE 54400	Structure & Physical Behavior of Polymer Systems
CHE 59700	<i>Special topic:</i> Organic Electronic Materials & Devices
ECE 30500	Semiconductor Devices
ECE 55700	Integrated Circuit Fab Lab
EEE 43000	Industrial Ecology And Life Cycle Analysis
IPPH 56200	Introduction to Pharmaceutical Manufacturing Processes
ME 41300	Noise Control
ME 50700	Laser Processing
ME 55400	Patents, Licensing and Tech Entrepreneurship – only 1 credit hour course
ME 55900	Micromechanics of Materials
ME 59700	Advanced Mechanical Engineering Projects I <ul style="list-style-type: none">• Environmentally Sustainable Design & Manufacturing• Environmentally Sustainable Design and Manufacture• Artificial Intelligence in Thermal Systems
NUCL 49700	Fuel Cell Engineering
PHYS 54500	Solid State Physics
PHYS 57000	Selected Topics in Physics <ul style="list-style-type: none">• Propulsion Design, Build, Test• Phys Chemistry & Nanomaterials• Fundamental Atomic Force Microscopy• Phys & Material Science of Semiconductor Nanostructures•

1.4.5. Support Area Electives

The list of Support Area Electives below is divided into three categories: Communication, Mathematics and Basic Science, and Engineering Support. These courses are not directly related to Materials Engineering, but will help you improve your written or oral communication skills (e.g., speech writing and analysis) or provide greater depth to topics touched on in MSE courses (e.g., statistics). Up to 6 credit hours of your Technical Elective Program may be satisfied using Support Area Electives. The Support Area Electives list is also available in the Undergraduate section of the MSE website.



Communication:

COM 25200 - Writing For Mass Media
COM 31400 - Advanced Presentational Speaking
COM 32500 - Interviewing: Principles And Practice
COM 45300 - Reporting Of Science News
COM 49500 - Special Topics -History of Marketing the President
ENGL 30400 - Advanced Composition
ENGL 39000 - Practicum In Tutoring Writing
ENGL 39100 - Composition For English Teachers
ENGL 40600 - Review Writing
ENGL 40900 - Intermediate Fiction Writing
ENGL 42000 - Business Writing
ENGL 42100 - Technical Writing
PSY 27200 - Introduction To Industrial-Organizational Psychology
Foreign Language #Any level 201 or higher

Engineering Support:

AAE 25100 - Introduction To Aerospace Design
AAE 53500 - Propulsion Design, Build, Test
ABE 20500 - Computations Engr Sys
BME 55100 -Tissue Engineering
CE 20300 - Principles And Practice Of Geomatics
CE 52400 - Legal Aspects In Engineering Practice
CE 55900 - Water Quality Modeling
CE 59700 - Civil Engineering Projects: Adv Sensing And Testing
CHE 20500 - Chemical Engineering Calculations
ECE 20100 - Linear Circuit Analysis I
ECE 20200 - Linear Circuit Analysis II
ECE 20700 - Electronic Measurement Techniques
ECE 49500 - Selected Topics In Electrical And Computer Engineering: Entrepreneurship
EPCS (2 Semesters Required)
EEE 30000 - Environmental And Ecological Systems Modeling
IE 33000 - Probability And Statistics In Engineering II
IE 34300 - Engineering Economics
IE 47200 - Imagine, Model, Make
IE 59000 - Topics In Industrial Engineering:
 - Advanced Manufacturing
 - Advanced Nanomanufacturing
ME 20000 - Thermodynamics I
ME 27400 - Basic Mechanics II
ME 49200 - Technology And Values
ME 44400 - Computer-Aided Design And Prototyping
ME 59700 - Adv Mech Engr Projects: Artificial Intelligence in Thermal Systems
MGMT 30000 level or higher
MSE 48900 - Ethics in Engineering Practice
NUCL 20000 - Introduction to Nuclear Engineering



NUCL 56300 - Direct Energy Conversion

Mathematics and Basic Sciences

BIOL 23000 - Biology Of The Living Cell
CHM 26100 - Organic Chemistry
CHM 26200 - Organic Chemistry
CHM 26300 - Organic Chemistry Laboratory
CHM 26400 - Organic Chemistry Laboratory
CHM 26605 - Organic Chemistry
CHM 37300 - Physical Chemistry
CHM 37400 - Physical Chemistry
CS 15900 - C Programming
CS 37300 - Data Mining and Machine Learning
EAPS 24300 - Mineralogy
EAPS 37500 - Great Issues - Fossil Fuels, Energy And Society
IPPH 56200 - Introduction To Pharmaceutical Manufacturing Processes
MA 30100 - An Introduction To Proof Through Real Analysis
MA 30300 - Partial Differential Equations For Engineering And The Sciences
MA 36200 - Topics In Vector Calculus
MA 45300 - Elements Of Algebra
PHYS 31000 - Intermediate Mechanics
PHYS 33000 - Intermediate Electricity And Magnetism
PHYS 34200 - Modern Physics
PHYS 55000 - Introduction To Quantum Mechanics
STAT 31100 - Introductory Probability
STAT 35000 - Introduction To Statistics
STAT 51100 - Statistical Methods
STAT 51200 - Applied Regression Analysis
STAT 51300 - Statistical Quality Control
STAT 51400 - Design Of Experiments
STAT 51600 - Basic Probability And Applications

The notes below provide the answers to common questions that are asked concerning the MSE Support Electives:

- 1) **Support Electives cannot be taken pass/no pass**, or satisfied by exam or test out. Other courses may be acceptable, subject to approval by petition to the Undergraduate Committee.
- 2) Some courses such as the #200 level or higher foreign language courses appear on **BOTH** General Education and Support Elective Lists, but can be taken to **fulfill only ONE requirement.**



1.4.6. Open Electives

As mentioned in section 1.2 there exist circumstances where you have satisfied the MSE program requirements without reaching the required 125 credits required for graduation. In these cases, students may complete any Purdue courses to meet the minimum 125-credit total. Further, there are no rules against exceeding the 125-credit minimum with courses of your choosing.

1.5. ASSEMBLING YOUR PLAN OF STUDY

All students must maintain a written plan of study for their MSE degree program and have it approved each semester before registration. Ideally, you will follow the “Recommended Plan of Study Sequence” as shown in Table 1.1; however, alternative sequences are acceptable, especially in cases where students are involved in the Co-Op (section 2.1) or Study Abroad (section 2.3) programs. The most up to date forms needed for registration are available through MSE 39000.

Sophomores should meet with their MSE faculty advisor to develop a Plan of Study. If you have identified any general education or technical electives you plan to take in the future please indicate this on your plan of study. **Juniors** and **Seniors** are also assigned a faculty advisor, with whom they are to meet to discuss career objectives and the selection of courses for technical and general electives. This is also a good time to discuss internship and undergraduate research opportunities.

1.5.1 Planning Ahead

If you are considering participating in Co-Op or Study Abroad, you need to be aware that either MSE 33500 or 36700 is a prerequisite for MSE 43000, the first semester of the MSE senior design sequence. Not fulfilling the MSE 43000 prerequisites could delay your graduation date. The Undergraduate Committee will be happy to work with you to develop a Plan of Study to facilitate your participation in Co-Op or Study Abroad. For all other students considering alternative sequences (e.g., due to internships, etc.), it is important to work with your faculty advisor to prepare an acceptable Plan of Study.

Suggested Plan of Study for the B.S. MSE Degree

Freshman Year

First Semester

- (4) MA 16500 (Analytic Geometry And Calculus I)
- (4) CHM 11500 (General Chemistry I) or CHM 13600 Honors
- (4/3) Written Communication Foundational Outcome course
- (2) ENGR 13100 or 1 (Transforming Ideas to Innovation I)
or ENGR 14100 (Honors version)

(14 or 13)

Second Semester

- (4) MA 16600 (Analytic Geometry And Calculus II)
- (4) CHM 11600 (General Chemistry II) or CHM 13600
- (4) PHYS 17200 (Modern Mechanics)
- (4/3) Oral Communication Foundational Outcome course
- (2) ENGR 13200 (Transforming Ideas to Innovation II)
or ENGR 14200 (Honors version)

(17)



Sophomore Year

Third Semester

- (3) MSE 23000 (Structure and Properties of Materials)
Prerequisites: CHM 11500, MA 16500
- (3) MSE 2nd year course*
- (3) MSE 2nd year course*
- (4) MA 26100 (Multivariate Calculus)
- (3) MA 26500 (Linear Algebra)

- (0) MSE 39000 (Seminar)

- (16)

***MSE 2nd year courses:**

- MSE 23500 Materials Properties Laboratory
Prerequisites: CHM 11500, MA 16500
- MSE 25000 Physical Properties in Engineering Systems
Prerequisites: PHYS 17200; Corequisites: MSE 23000, MA 26500 (or MA 26200)
- MSE 26000 Thermodynamics of Materials
Prerequisites: MA 26100, Corequisites: MSE 23000, CHM 11600 (or CHM 13600)
- MSE 27000 Atomistic Materials Science
Corequisites: MA 26100, MA 26500 (or MA 26200), MSE 23000

Fourth Semester

- (3) MSE 2nd year course*

- (3) MSE 2nd year course*
- (3) PHYS 24100 (Electricity and Optics)
- (3) MA 26600 (Ordinary Differential Equations)
- (1) PHYS 25200 (Elec. And Optics Lab)
- (3) General Education Elective
- (0) MSE 39000 (Seminar)

- (16)

Junior Year

Fifth Semester

- (3) MSE 3rd year Lab course**
- (3) MSE 34000 (Transport Phenomena)
Pre-MA 26600 (or MA 26200), MSE 26000
- (3) MSE 37000 (Elec, Opt, and Mag. Props. of Materials)
Prerequisites: MSE 23000, MSE 27000, PHYS 24100 (or PHYS 27200)
- (3) MSE 420 (Structure & Props. of Organic Matls.)
- (3) General Education Elective
- (0) MSE 39000 (Seminar)

- (15)

****MSE 3rd year Lab courses:**

- MSE 33500 (Materials Characterization Laboratory) -- Prerequisite: MSE 23500
- MSE 36700 (Materials Processing Laboratory) -- Prerequisites: MSE 23500, MSE 26000

Sixth Semester

- (3) MSE 3rd year Lab course**
- (3) MSE 33000 (Proc. and Props. of Matls.)
Prerequisite: MSE 23000
- (3) MSE 38200 (Mechanical Response of Materials)
Prerequisites: MSE 25000, MA 26500 (or MA 26200)
- (3) General Education Elective
- (3) Technical Elective
- (0) MSE 39000 (Seminar)

- (15)

Senior Year

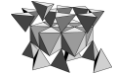
Seventh Semester

- (3) MSE 43000 (Materials Processing and Design I)
Prerequisites: MSE 33500 or 36700
- (3) MSE 44500 (Materials Engineering Systems Analysis)
Pre-MSE 33000, 34000, Co-MSE 43000
- (6) Technical Electives
- (3) General Education Elective
- (0) MSE 39000 (Seminar)

Eighth Semester

- (3) MSE 44000 (Materials Processing and Design II)
Prerequisites: MSE, 43000
- (9) Technical Electives
- (6) General Education Electives
- (0) MSE 39000 (Seminar)

- (18)



Notes:

Students entering the School of Materials Engineering should have completed the sequence of CHM 11500 and 11600 or the sequence of CHM 12300 and 12400 (or CHM 13600).

Eighteen credit hours of general education electives are chosen in accordance with the general education requirements of the Schools of Engineering.

Eighteen credit hours of technical electives must be selected from lists of courses approved by the faculty of the School of Materials Engineering. At least 12 of the 18 hours are to be selected from an approved list of Materials courses. Up to 6 hours can be chosen from a separate list of courses, which includes other Support Areas.

Of the courses used to satisfy the minimum graduation requirements, the pass/not-pass option may be applied only to the 9 credits of unspecified general education electives.

Phys 25200 is a 1-cr hour lab course. It may be replaced by another 1-credit hour stand-alone science lab course such as CHM 25700L (which compliments CHM 25700) or CHM 26300. Another possibility is to take PHYS 27200 (Electric And Magnetic Interactions), a 4-credit hour course which will count for PHYS 24100 (3-credit hour) and PHYS 25200 (1-credit hour).

The preferred math sequence includes MA 26500 and MA 26600. Under certain circumstances MA 26200 (Linear Algebra And Differential Equations) and either MA 30300 (Differential Equations and Partial Differential Equations for Engineering and the Sciences) or MA 35100 (Elementary Linear Algebra) may be approved to replace MA 26500 and MA 26600

Courses taken by students in First Year Engineering (FYE) that satisfy the FYE Science Selective requirements or Foundational Learning Outcomes but are not directly listed in the MSE Plan of Study will count as either an MSE Support Area Elective or as an MSE General Education Elective.

1.5.2 Progress to a degree in Materials Engineering, BSMSE

MSE students who have not taken an MSE course for two consecutive semesters will be required to CODO to another major, not take courses at the West-Lafayette campus or resume progress in MSE courses for the following semester.



1.6. PETITIONING

Exceptions to any of the published requirements for graduation require approval by petition to the Undergraduate Committee of the School of Materials Engineering. A petition from a student to the Undergraduate Committee is specifically required for the following:

- A. Acceptance of credit from Study Abroad programs for courses not receiving prior approval.
- B. Approval of Technical, Support Area, or General Education Electives not on current lists.
- C. Consideration of any other exceptions to normal graduation requirements.

Petitions are submitted as a memo addressed to the Undergraduate Committee and include the following:

- 1. A general statement of the request and its rationale.
- 2. In case B above, a course description and syllabus (if available) for potential addition to the General Education or Technical Electives list.

The Undergraduate Committee will consider each petition and provide a formal written response to the student.

SECTION 2. OPPORTUNITIES

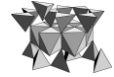
2.1. THE CO-OP PROGRAM

Cooperative Education is a formal plan of education in which a student alternates sessions of full-time work with sessions of full-time study. Purdue's Cooperative Education Program (Co-Op) is a professional development experience, designed to combine practical on-the-job experiences with the classroom training of a four-year college curriculum. It helps students integrate theory and practice, confirm career choices, investigate potential job opportunities, and become better graduates. At the same time, it allows students to earn money and help finance their education. For general information on the Co-Op program please see <https://www.opp.purdue.edu/our-programs/undergrad-co-op>

There are both 3-session and 5-session Co-Op programs described at the Office of Professional Practice (OPP) website. When planning your work sessions, be aware that the yearlong MSE senior design sequence requires that MSE 43000 and MSE 44000 be taken in order during the same year (fall and spring semesters). Some MSE courses are offered during summer semester and these typically are MSE 23000, MSE 23500, MSE 33000, and MSE 36700. Students interested in the Cooperative Education program should talk with the MSE Co-Op advisor (Prof. David Johnson, davidjoh@purdue.edu).

2.2. INTERNSHIPS AND SUMMER RESEARCH EXPERIENCE

Even if you are not a Co-Op student, it is still important that you experience Materials Engineering outside of the classroom either in an industrial or research setting. Summer is a particularly good time for industrial internships or university or National Laboratory research experience. Job fairs, especially the Industrial Roundtable during the fall semester, are great settings to make contacts for internship opportunities. When looking for summer research programs at universities, a good place to start is the National Science Foundation's Research Experience for Undergraduates (REU) program that sponsors summer research at universities

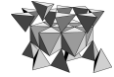


across the United States. You can search for more information about the REU program at www.nsf.gov. Also, the College of Engineering sponsors a Summer Undergraduate Research Fellowship Program, or SURF, that affords research experience for undergraduates. The program runs from late May through early August; information regarding this program can be found at: <https://engineering.purdue.edu/Engr/Research/SURF/>. Note that the application dates are early in the spring semester. It is generally best to identify a faculty member with whom you want to work, and to discuss whether they can support you in this program.

2.3. MATERIALS ENGINEERING STUDY ABROAD (MESA)

In recent years increasing numbers of MSE students have been spending a semester or a year overseas via the Study Abroad Program. You can learn more about Purdue's Study Abroad Program in general by visiting www.studyabroad.purdue.edu. Below are some general comments about Study Abroad.

- **Start your preparations as early as possible!** Typically, students take Study Abroad during their junior year, but some go as early as their sophomore year. Virtually all students deviate from the “Recommended Plan of Study Sequence” (section 1.3), so advanced planning is necessary to determine which courses should be taken earlier and which should be delayed. Please remember, you will also need to apply through the Study Abroad Program, and there are deadlines for the various programs in their office.
- Study Abroad enhances your education and students are encouraged to take advantage of this opportunity. The specific changes needed to your Plan of Study depend on your Study Abroad locale and should be discussed with your faculty advisor.
- In general, it is easier to satisfy Technical and General Education electives than Core Courses during Study Abroad. This is in part due to relatively few courses equivalent to Core Courses, and in part because acceptable courses at a given university may not be offered on a regular basis.
- Courses from Study Abroad locales must be approved for Purdue credit, beginning with the Office of Study Abroad.



2.4. MSE 499 RESEARCH IN MATERIALS ENGINEERING

The course MSE 49900 provides the opportunity for laboratory and/or library research beyond the scope of the ordinary undergraduate curriculum, working in a research environment under the direct guidance of a faculty member. Independent Research (MSE 49900) may be taken for 1, 2 or 3 credits in a given semester, and up to 6 credits of MSE 49900 can count towards fulfilling your Technical Elective Program. To enroll in MSE 49900 your first step is to find a member of the faculty who is willing to supervise your research project. Next you should arrange a meeting with the faculty member to inquire if he/she is willing to act as your research advisor and discuss possible projects. After finding a faculty advisor you should submit a petition to the Undergraduate Chairman for approval of your MSE 49900 project. A template for your petition can be found at: https://engineering.purdue.edu/MSE/foryou/undergraduate/Research_Opportunities

Submission procedure to schedule MSE 499:

- 1) Email your MSE 49900 petition to: Mse499-list@ecn.purdue.edu
- 2) In the email, you will need to indicate how many credit hours they are seeking by using

MSE 49900A - 1 credit hour

MSE 49900B - 2 credit hours

MSE 49900C - 3 credit hours

- 3) You will also need to “cc” your faculty advisor overseeing the research. The faculty advisor can then reply with their “approval” for an electronic signature.

- 4) Use the scheduling assistant to request a department approval override of one of the following:

MSE 49900A - 1 credit hour

MSE 49900B - 2 credit hours

MSE 49900C - 3 credit hours

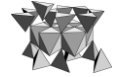
- 5) After approval, use the scheduling assistant again to actually add the course to your schedule.

Notes:

1) For every credit of MSE 49900 taken, you are expected to provide 3 hours per week of available time in your schedule during regular business hours (8 AM – 5 PM) for laboratory or library research.

2) Due to safety concerns, MSE 49900 research performed outside regular business hours must be accommodated by special arrangement and is the exception rather than the rule.

3) Students taking MSE 499 for 3 credits may substitute 3 of the weekly laboratory hours for a one-hour research meeting with their advisor.



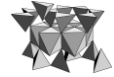
2.5. SOCIETY OF MATERIALS SCIENCE ENGINEERS (SMSE)

The Society of Materials Science Engineers is a student chapter representing the major MSE professional organizations including the Materials Research Society (MRS), the American Ceramic Society (ACerS) and the Minerals, Metals and Materials Society (TMS) and the Iron and Steel Society. Membership in the above national organizations is possible by joining the “Materials Advantage”. Joining this single organization, provides a student with official membership all of the four listed national organizations. The student group, SMSE, promotes communication among students in Materials Engineering, holds social events like pizza dinners and pool tournaments, and outreach. For more information please visit the Student Societies link on the Materials Engineering Home page.

2.6. SCHOLARSHIPS AND AWARDS

There is an official application that MUST BE COMPLETED to be considered for a scholarship in MSE. The link will be found on the MSE undergraduate website. The due date for application is a “hard” date and all applications must be submitted by that date with no exceptions. This date is typically in May but may change from year to year. The actual date and relevant information will be presented in MSE 39000, and through school-wide e-mail messages.

Undergraduate scholarships fall into three categories. Scholarships and awards exclusively for Purdue MSE students include the John Deere Foundation, the Sopcak Memorial, the Matthew M. Slone Academic Excellence Award, and the John Bray Award. Other companies that award scholarships include U.S. Steel, Alcoa, and Precision Cast Parts. Purdue University also provides a limited number of awards including the Graduating Student Awards. Finally, national societies like the American Society for Metals (ASM) and the Minerals, Metals and Materials Society (TMS) have annual scholarship competitions.



2.7. HONORS PROGRAM

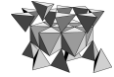
The overall academic criteria for the School of Materials Engineering (MSE) Upper-Division Component of the College of Engineering Honors Program (CoEHP) needed to earn a “BS-MSE with Honors” are described below. These requirements are consistent with EFD 07-09.

ACADEMIC REQUIREMENTS:

1. Eligibility – entry into the MSE Upper-Division Component of the CoEHP is based on minimum overall GPA of 3.7 (or the CoEHP required GPA if it is more restrictive) as well as the ability to complete programmatic requirements by graduation. Students eligible for the program are typically notified by the Engineering Honors Program.
2. Honors Completion – To complete the College of Engineering Honors Program and earn a “BS-MSE degree with Honors,” participants must have:
 - a) completed the course requirements for a bachelor of science in MSE; and
 - b) earned a minimum of 24 honors points, 12 of which are specific to MSE, with the remaining points accumulated from non-MSE honors courses; and
 - c) possess an overall GPA of 3.7 (or the CoEHP required GPA if it is more restrictive) at the time of graduation; and
 - d) completed a significant research or design experience that resulted in a public scholarly activity such as an oral or poster presentation. Note that MSE 430 or MSE 440 cannot count towards meeting this requirement.
 - e) Also, students must participate in the required sophomore and junior CoEHP Honors Seminar, in addition to any required MSE seminar courses.
3. MSE Specific Honors Points – students must earn a minimum of 12 honors points from approved research/design experiences and coursework. These include:
 - a. 3 to 6 credit hours (negotiated with the research advisor) of MSE 499 Undergraduate Research. Students must complete a significant research experience. Following completion of the entire project, their results should be presented as part of a public scholarly activity.
 - b. Up to 9 credit hours of any 500-level MSE course. Such courses may be used to satisfy BS-MSE degree requirements or reserved for possible graduate credit.

2.7.1 SUPPLEMENTARY INFORMATION:

4. Participants must maintain a minimum overall GPA of 3.7 (or the CoEHP eligibility GPA if it is more restrictive) to be in good standing. Students falling below the required eligibility GPA will be placed on Honors probation. Students on Honors probation will have one semester (excluding summer sessions) to re-establish their eligibility. Failure to re-establish eligibility will result in the forfeiture of all rights and privileges afforded CoEHP participants. Rights and privileges may be reinstated once eligibility is re-established.
5. The MSE Undergraduate Committee will bring proposed modifications to the MSE honors program, including the minimum GPA criterion, to the MSE faculty for a vote.
6. The effective date of this document is Fall 2011. Students involved in and satisfying MSE Honors requirements prior to this document will be allowed to complete said program using their previously established criteria.



2.8 COMBINED BS/MS PROGRAM

Undergraduates who intend to continue their studies in the Graduate School at Purdue may wish to begin their graduate coursework in their senior year, while they are still completing their undergraduate requirements. Getting an early start on the graduate program often leads to greater choice of graduate courses, and earlier completion of the graduate degree.

However, the acceptance of the student by the program into early graduate admission is dependent on successful application to the program and finding a graduate advisor, and is also conditioned on eventual successful completion of the undergraduate degree. Students interested in this option should discuss it with the Chair of the Graduate Committee. Early admission to the Graduate School may not be required for undergraduate students wishing to begin graduate study early, unless they are to receive a graduate staff appointment. They may simply request the designation of graduate courses as excess to their baccalaureate requirements, on *Registrars Form 350*.

Students who are to be employed as Research Assistants or a Teaching Assistant while still completing the baccalaureate must, however, be admitted to the Graduate School, because these appointments are restricted to students who are enrolled in the Graduate School. Admission to the Graduate School may be granted in the session in which the baccalaureate degree is being completed, with the permission of the School of Materials Engineering and the Dean of the Graduate School. The usual graduate application and supporting materials are required, but must be accompanied by a memorandum from the Head of the School setting forth and justifying the request for early admission.