IOWA STATE UNIVERSITY

Department of Materials Science and Engineering

2025-2026 Undergraduate Handbook

I. INTRODUCTION

This guide has been prepared as a resource to help you progress toward your degree in the Department of Materials Science and Engineering (MSE) at Iowa State University. This handbook is far from all-inclusive, and it is intended to supplement other valuable sources of information such as the Iowa State University Catalog, Workday, and information you will receive from your academic advisor or course instructors.

Iowa State University Catalog - http://catalog.iastate.edu/

Workday - https://workday.iastate.edu

MSE Department - http://www.mse.iastate.edu

We hope you will read the MSE Undergraduate Handbook now and also refer to it frequently throughout the coming semesters. You can also access the MSE Undergraduate Handbook online on the MSE homepage (www.mse.iastate.edu). Under the "Undergraduate Programs" drop-down menu, select the "Academic Advising" page, where you will find a number of academic advising resources.

We are here to help in whatever ways we can – please don't hesitate to ask!

II. THE DEPARTMENT OF MATERIALS SCIENCE & ENGINEERING

The MSE Department was formed in 1975 by the merging of the two previously existing departments of Ceramic Engineering and Metallurgy. MSE is one of eight degree-granting departments in the College of Engineering.

The departmental office is located in 2240 Hoover Hall. At this location, you can find the Department Chair, academic advisors, and members of the MSE staff. Many departmental faculty are located in 2220 Hoover Hall.

II.A. The MSE Faculty

One of the most important elements in any department is its faculty and we have good reason to be extremely proud of ours. Our faculty are nationally- and internationally known experts in their fields. They are very student focused and excel in engaging students in course material and research opportunities.

II.B. The Advising System

Developing a good working relationship with your academic advisor will be critical to your success as a student. The goal of the departmental advising system is to assist you in the formation of an academic program that meets your career objectives and curriculum requirements. Your advisor interprets the rules and requirements of the university as well as the college and department, so you are able to make informed decisions.

APPENDIX A provides a list of MSE's academic advisors. When you join the department, you will be assigned an official advisor, and you should utilize this person as your primary point of contact for any advising needs and questions. However, if you are experiencing an urgent advising issue and your advisor is unavailable, feel free to contact the alternate advisor or the MSE front office staff located in 2240 Hoover.

Communication is key to the advising relationship. For this reason, please keep your current address and phone number (cell preferred) updated on your Workday profile. Check your ISU email frequently, as your advisor, MSE faculty and staff send many important messages. Email is considered an official form of communication by Iowa State University, so expect that it will be used to relay updates and notices from the university, college, and department.

If your advisor cannot resolve a problem, either academic or personal, or if you are unable to get in touch with the advisors for an urgent issue, the MSE Department Chair or Associate Department Chairs will be happy to assist you. You are encouraged to visit with both the Chair and Associate Chair at any time, even when there are no problems.

II.C. Teaching Facilities and Safety Policy

An attractive feature of our department is that the small class sizes make instruction more interactive, and our curriculum includes a large number of laboratory courses that provide hands-on education to students. All teaching laboratories for the department are located in Hoover Hall.

Specific instructions regarding procedures and techniques will be given to students enrolled in each laboratory course. Information will be provided concerning the specific safety precautions that must be followed by every student. Students are required to pursue their laboratory coursework in a safe, scientific, and professional manner.

Safety of all students, faculty, staff, and visitors is a top priority. The responsibility for your personal safety can never rest solely with the instructor or staff. It is your co-responsibility to become familiar with the safety guidelines. The major hazards encountered in the laboratory setting include high temperatures, dangerous chemicals, and ionizing radiation. Ask your instructor for information regarding safety provisions and emergency procedures. The use and location of tongs, protective gloves, explosion-proof storage units for flammable chemicals, chemical sinks, fume hoods, eyewash fountains, body showers, and monitors for ionizing radiation should be discussed at the beginning of the semester. If the instructor does not include this information in your introduction to the course, then you should ask either the instructor, MSE Lab Coordinator, or MSE's Associate Chair for Undergraduate Education. Use your common sense – if you do not have enough information, please do not attempt any hazardous procedures.

II.D. MSE Student Room Facilities

The MSE department maintains excellent computer and study facilities for use by MSE undergraduate students. The student room is located in 3337 Hoover and contains computers (PC) with software needed for MSE homework and laboratory assignments, laser (B&W and color) printers and scanner. These computers are networked to the college file server as well as to the Internet.

The student room also has space available for group work, and students often meet there to work on homework and labs. The rooms are accessible 24 hours/day with a coded University ID card. (See the front desk staff in 2240 Hoover to gain access.) Your University ID card will also give you access to Hoover Hall after hours. Building hours are currently Monday through Sunday 6 a.m. to 10 p.m. The department's systems support specialist maintains the computer lab. If you have questions, problems, or concerns, please email msetech@iastate.edu.

II.E. Undergraduate Research Opportunities

There are a significant number of opportunities for undergraduate students in MSE to secure part-time employment as research or teaching assistants. Faculty members in the department hire students as early as their first year in the program depending on the needs of the research group or course. You will hear about some positions through the MSE undergraduate email listserv or from faculty directly. However, at any time you can express your interest in these types of positions to your academic advisor. Your advisor can help you connect with opportunities that fit your interests and qualifications. Most positions are paid on an hourly basis, but occasionally faculty may offer you a non-funded position through enrolling in MATE 4990. MATE 4990 is a non-credit bearing course (offered for "R" or "required" credit, on satisfactory-fail basis), and it can be added to a student's schedule in any fall, spring, or summer term through the designated add/drop deadline.

II.F. Co-op/Internships

Gaining experience outside the classroom is highly encouraged by the department and College of Engineering as a way to make yourself more knowledgeable, versatile, and marketable for post-graduation career endeavors. There are a couple types of experiences available:

- **Co-op** – semester + summer (6 months)
- **Summer Internship** – minimum of 10 weeks

Finding these positions is student-driven, but there are many resources available to help you in your search:

- **CyHire** – database which provides information about professional development and available positions (https://cyhire.iastate.edu/)
- **College of Engineering Career Fairs** – hundreds of employers visit campus each fall and spring semester for a one-day event that offers access to recruiters
- **MSE Advisors and Faculty** – watch for emails passed on from company contacts, as these are sent throughout the year
- **National job boards (**such as www.indeed.com)

To apply for positions, you will need to be ready to submit the following information:

- **Cover letter or statement of interest** – each application is different, but often you are asked to express why you are applying for the position and how your qualifications match well with the job requirements
- **Resume** – creating an effective resume is essential to summarizing your experience and activities for employers
- **References** – as you progress through your academic experience, remember to connect with faculty and staff who can later serve as professional or personal references during your job search

Engineering Career Services provides many resources which can help you develop these marketing materials for your job search. You can access their library of information here: https://www.engineering.iastate.edu/ecs/students/.

II.G. Study Abroad

One of the most exciting opportunities available to complement your Mat E curriculum is to study abroad! Whether you select an experience that lasts a few weeks, or you plan ahead and study at an international institution for a semester or year, you will certainly gain a new perspective and broaden your cultural and academic knowledge. Students are able to select from a variety of locations worldwide, including (but not limited to):

- United Kingdom (England, Wales, Ireland, Scotland)
- Mainland Europe (Italy, Germany, France, Spain)
- Australia
- Singapore
- China

MATE 2730 in London Program

Holly Dunlay-Lott, Advisor in Materials Science & Engineering, coordinates a four-week summer program for first-year students at Brunel University (Uxbridge, England – western suburb of London). MATE 2730 starts during the second half of the spring term and finishes during the four weeks abroad. During the summer portion (mid-May to mid-June), students will have four weeks of coursework as well as industry and cultural tours. Upon completion of the summer portion, students will get credit for:

- MATE 2730 (3 cr) – meets the MATE 2150 requirement
- ISU's International Perspectives requirement

The deadline to apply for this program is early December of your first year of study. If you are interested in participating or would like additional information, please contact Holly Dunlay-Lott (hollyd@iastate.edu) or your academic advisor.

III. ACADEMIC MATTERS

The MSE Department offers an undergraduate curriculum that leads to a Bachelor of Science degree in Materials Engineering. The four-year curriculum sheet (found in Appendix B) offers a general template for academic planning. To create your own individual plan, taking into account your unique interests and goals, please consult your academic advisor.

III.A. Academic Progress

There are a number of resources available to help you track progress toward your degree:

- **Academic Progress Report** – document available through the "Academics" menu→ "Academic Progress" tab on Workday, which provides a list of degree requirements and accounts for the courses you have taken or are currently taking, as well as the transfer credits you may have brought into ISU.
- **Curriculum Sheet** – visual way to show a typical progression of coursework (see Appendix B). You can follow the curriculum of your entry term or a more recent year.
- **Midterm grades** – posted on Workday at the mid-point of each semester as a way for faculty to alert you if your current grade is a C- or below.
- **Grade Report** – issued via Workday at the end of each semester, noting the courses you completed and the grades you earned.
- **Academic Advisor**

III.B. Pre-requisite Enforcement

When planning your course progression, please pay special attention to listed pre-requisites and co-requisites. If a course has a required pre-requisite, you must have completed the pre-requisite with a passing grade prior to taking the class. In some cases, there is a grade requirement attached to the pre-requisite. For example, you must earn a grade of C- or better in MATH 1650 (Calc I) to be eligible to move on to take MATH 1660 (Calc II). If a course lists a co-requisite, then you must have credit or concurrent enrollment in the co-requisite course while you are taking the class.

Pre-requisites and co-requisites are strictly enforced in Workday at the time of registration. If you wish to enroll in a course but do not meet the pre-requisite and/or co-requisite, you must submit an override in Workday. Students can learn more about this process through their academic advisor. Course pre-requisites and co-requisites are listed in the Schedule of Classes as well as in the Courses and Programs section of the ISU Catalog.

III.C. Program Objectives and Outcomes

The Materials Engineering curriculum has been designed to provide you with experiences to develop necessary knowledge and skills, and it follows the accreditation policies of our accrediting body, ABET.

Program Educational Objectives

Within the scope of the MSE mission, the objectives of the Materials Engineering Program are to produce graduates who:

> *Work*-competently engage in professional employment, applying knowledge and skills related to the structure, properties, processing, and performance for materials.
>
> *Learn*-invest in broad life-long learning activities, such as advanced academic or professional degree programs, practical training, professional development, and leadership training.
>
> *Serve*-actively contribute to professional communities in their chosen career paths, including professional societies, advisory boards, standards and regulatory boards, and internal company organizations.

Student Educational Outcomes

Graduates in materials engineering will have demonstrated the following at the time of graduation:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce 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 judgements, which much 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, analyze, and interpret data, and use engineering judgement to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

III.D. Choosing Area of Specialization

You must choose one area of specialization from the following types of materials: ceramics, metals, or polymers. You may also elect to use your required Mat E electives (6 cr.) or technical electives (12 cr.) to complete one or two additional specializations. The choice of specialization is typically made at the end of the sophomore year after you have taken the beginning sequence of core courses that cover all material types (MATE 2150, MATE 2160).

III.E. Grade Requirements for Graduation

In addition to the university rule that you must earn a **minimum cumulative ISU GPA of 2.0**, you also must earn a **minimum average GPA of 2.0** in the following core MAT E courses:

MATE 1700	MATE 3110	MATE 4130
MATE 2140	MATE 3140	MATE 4140
MATE 2150/2150L	MATE 3170	MATE 4180
MATE 2160/2160L	MATE 3190	

*__Plus__ your four specialization courses (12 credits from your official area of specialization).

III.F. Communication Requirement

The MSE Department requires you to earn a grade of C or better in Engl 1500 and 2500 and one of the following courses: Engl 3020, 3090, or 3140.

III.G. Departmentally Approved Electives

The Mat E degree program requires 12 credits of General Education electives and 3 credits of Technical Writing:

- **Gen Ed** (3 cr) – following criteria found in Appendix C.1
- **Gen Ed** (3 cr) – following criteria found in Appendix C.1
- **International Perspectives Requirement** (3 cr) – select from approved list found at: http://www.registrar.iastate.edu/students/div-ip-guide/IntlPerspectives-current
- **U.S. Cultures and Communities Requirement** (3 cr) – select from approved list found at: http://www.registrar.iastate.edu/students/div-ip-guide/usdiversity-courses
- **Technical Communication Requirement** (3 cr) – select one of the following courses:
  - Engl 3140 – Technical Communication
  - Engl 3020 – Business Communication
  - Engl 3090 – Report and Proposal Writing

Additionally, students are able to tailor their curriculum to their individual interests through required technical electives. Students must take 6 credits of Mat E electives and 12 credits of technical electives (criteria found in Appendix C.2) from the approved departmental list.

Mat E Electives (must take a minimum of 6 credits) – 3000+ level course in Mat E or MSE, with the following exceptions:

- Students cannot use MATE 4900, MSE 5900, or MSE 6990 without prior approval from the MSE Curriculum Committee before the course is taken. Please see your academic advisor for more information.

Technical Electives (must take a minimum of 12 credits) – 3000+ level course in STEM fields, with the following exceptions:

Students **cannot** take any of the following to meet the technical elective requirement

- Courses in the 4900s/4990s/5900s in any department without prior approval from the MSE Curriculum Committee before the course is taken. Please see your academic advisor for more information.
- BIOL 3070 (cross-listed with WS)
- ME 4840/5840
- STAT 3050

III.H. Course Substitution Policies

Credit deficiency in…	Courses which may be used to fill credit deficiency
1000- level math & science course	**1000+ level STEM courses** However, it may **not** be a course remedial to the Mat E undergraduate program (i.e. Math lower than 1650, Chem lower than 1770, Phys lower than 2310, lower-level Stat, COMS 1030, etc)
2000- level math & science course	**≤ 3 credits total deficiency across degree program:** **2000+ level STEM courses** However, it may **not** be a course remedial to the Mat E undergraduate program (i.e. Phys lower than 2310, lower-level Stat) **Beyond 3 credits total deficiency across degree program:** **2000+ level courses in Math or Science** May not use Engineering courses
2000- level engineering course	**2000+ level STEM courses**
3000- or 4000- level STEM course	**3000- or 4000- level STEM courses**

(EM/CE 2740 + EM/ME 3240) requirement changed to MATE 3190

- Applies to any ISU student an on active catalog.
- Students must choose one of the following ways to meet the degree requirements:
  - **EM/CE 2740 (3 cr) + EM/ME 3240 (when both are taken at ISU) (3 cr)**
  - **MATE 3190 (3 cr) + technical elective (3 cr)**
  - **Important note: Only one of MATE 3190 or (EM/CE 2740 + EM/ME 3240) may be used toward graduation requirements.**

III.I. Pass/ Not Pass Grading

Students may take up to six credits of general education on a pass/not pass basis, meaning that only a P (pass – earned grade of D- or better) or NP (not pass – earned grade of F) will be recorded as their final grade in the course. Students must earn a grade of "P" (Pass) in order to meet a general education requirement. However, those courses meeting U.S. Cultures and Communities and International Perspectives requirements may NOT be taken P/NP. The purpose of P/NP grading is to encourage students to take more challenging courses than their usual program of study requires. You may not be on academic probation to take a course P/NP. If interested, students should discuss this option with their advisor.

III.J. Scholarships

The Department maintains an outstanding scholarship program for its undergraduate students. Also, many general scholarships open to students in all disciplines of the College of Engineering are available to students in our department. In recent years, Mat E students have received scholarships ranging from $500-$7500.

To apply for any of the scholarships offered by the MSE Department or the College of Engineering, a student **MUST** complete the College of Engineering scholarship application, which is available online (http://www.engineering.iastate.edu/scholarships/current-students/).
The deadline to submit scholarship applications is around March 1st each year.

III.K. Student Organizations

One of the best ways to get engaged in materials engineering is to become an active member of one or more of MSE's outstanding student organizations. You will get to know your peers, network with faculty and industry professionals, and have the chance to develop your leadership skills. A list of current student officers can be found in Appendix D.

Material Advantage (MA) – an award-winning student chapter of four professional Materials Science & Engineering societies: American Society of Materials (ASM), The Materials Society (TMS), The American Ceramic Society (ACerS), and The Association for Iron & Steel Technology (AIST). Students are actively involved in K-12 outreach, community service, professional development, and networking with research and industry experts. For additional information, visit http://materialadvantage.org/ or contact a member of the current student executive board (Appendix D).

Gaffer's Guild – an artistic glass blowing club with membership open to all ISU students and members of the Ames community. The group provides training to members each semester, but participation is limited depending on availability of instructors and studio time. For additional information, visit http://gaffer.stuorg.iastate.edu/ or contact a member of the current student executive board (Appendix D).

Metallurgica - an organization for students interested in the science and engineering of metals. It seeks to provide practical and hands-on opportunities for students, including competitions sponsored by the professional societies, tours of various facilities, and other experiences provided through university connections. It is a new organization, and in its inaugural year, students competed in the TMS "Blade smithing" competition and are currently working towards competing in a metallographic competition as well. For additional information, visit https://www.stuorg.iastate.edu/2653 or contact a member of the current student executive board (Appendix D).

III.L. Concurrent BS/MS Program Application Guidelines

Overview

The following information provides details of the MSE Department's concurrent BS/MS or BS/MEng program and requirements. This information is also available on the MSE website at http://www.mse.iastate.edu/students/concurrent/.

The Department of Materials Science and Engineering can admit qualified seniors into the program for "Concurrent Enrollment for Graduate/Undergraduate Degrees." A student in this program pursues a graduate MS or MEng degree while simultaneously completing his/her undergraduate BS degree. The degrees will be conferred on the date when the requirements are completed, with the BS typically in year 4 and MS/MEng typically in year 5.

Students seeking admission to this program will typically apply during their junior year of undergraduate education or within one year before the expected semester of BS graduation. Before applying for concurrent enrollment, students are encouraged to discuss the matter with their academic advisor, the potential major professor, and either the Director of Graduate Education or the MSE Graduate Program Coordinator. In addition, students receiving any sort of financial aid are advised to consult with the Office of Financial Aid prior to applying for concurrent enrollment.

Qualifications:

- Must meet the departmental minimum standards for graduate admission:
  - Minimum cumulative GPA of 3.0
- Minimum of 90 credits in B.S. degree requirements completed by the time of concurrent enrollment.
- For BS/MS Program: MSE faculty member must be identified to serve as major professor. (This is not needed for the BS/MEng Program, as the DOGE will serve as the graduate mentor.)

For information on the necessary forms and information needed to complete an application, please visit: https://www.grad-college.iastate.edu/academics/programs/apresults.php?id=75

IV. CONCLUSION

We hope that the information presented in this handbook has helped to answer some of your questions as you begin your academic career in the department. We wish you great success in all of your activities while you are at Iowa State University and after you depart. We are here to help you achieve success in any way we can, so please do not hesitate to ask for assistance.

UNDERGRADUATE ACADEMIC ADVISORS

NAME	OFFICE	PHONE	EMAIL
Holly Dunlay-Lott	2240D Hoover	515-294-5713	hollyd@iastate.edu
Andrea Klocke	2240K Hoover	515-294-0891	aklocke@iastate.edu

HONORS PROGRAM FACULTY ADVISOR

NAME	OFFICE	PHONE	EMAIL
Dr. Duane Johnson	130 Spedding	515-294-2122	ddj@iastate.edu

UNDERGRADUATE CURRICULUM CHAIR

NAME	OFFICE	PHONE	EMAIL
Dr. Ralph Napolitano	2220C Hoover	515-294-9101	ren1@iastate.edu

APPENDIX B

MAT E DEGREE: 4-YEAR PLAN

(For curriculum sheets based on previous catalogs – see advisors)

Curriculum in Materials Engineering

2025 Catalog

Total credits required: 128

Freshman Year					
Semester 1	16 cr	Year taken	***Semester 2***	17 cr	Year taken
Math 1650	**4 cr**		**Math 1660**	**4 cr**	
Chem 1770	**4 cr**		Chem 1780	3 cr	
Chem 1770L	1 cr		Chem 1780L	1 cr	
English 1500	**3 cr**		Mat E 1700 (S)	3 cr	
Engr 1010	**R cr**		English 2500	3 cr	
Engr 1600	**3 cr**		Gen Ed: _____	3 cr	
Lib 1600	**1 cr**				
Sophomore Year					
Semester 3	16 cr	Year taken	***Semester 4***	16 cr	Year taken
Math 2650	4 cr		Mat E 3010 (S)	R cr	
Mat E 2150 (F,S)	3 cr		Math 2670	4 cr	
Mat E 2150L (F,S)	1 cr		Mat E 2140 (F,S)	3 cr	
Phys 2310	**4 cr**		Mat E 2160 (F,S)	3 cr	
Phys 2310L	**1 cr**		Mat E 2160L (F,S)	1 cr	
Gen Ed: _____	3 cr		Phys 2320	4 cr	
(U.S. Cultures and Communities)			Phys 2320L	1 cr	
Junior Year					
Semester 5	15 cr	Year taken	***Semester 6***	15 cr	Year taken
Mat E 3110 (F)	3 cr		Mat E 3140 (S)	3 cr	
Mat E 3170 (F)	3 cr		Mat E 3190 (S)	3 cr	
Specialization: _____	3 cr		Specialization: _____	3 cr	
Mat E elec.: _____	3 cr		Tech. elec.: _____	3 cr	
Stat 3050	3 cr		Gen Ed: _____	3 cr	
			(International Perspective)		
Senior Year					
Semester 7	15 cr	Year taken	***Semester 8***	18 cr	Year taken
Mat E 4130 (F,S)	3 cr		Mat E 4140 (F,S)	3 cr	
Mat E 4180 (F)	3 cr		Specialization: _____	3 cr	
Specialization: _____	3 cr		Mat E elec.: _____	3 cr	
Tech. elec.: _____	3 cr		Tech elec.: _____	3 cr	
Tech. Writing*: _____	3 cr		Tech elec.: _____	3 cr	
			Gen Ed: _____	3 cr	

***Choose one of the following courses: Engl 3140, Engl 3020, or Engl 3090.**

Specialization Course Sequences

(***Note*** : F = offered Fall only, S = offered Spring only)

Ceramics	Metals	Polymers
Mat E 3210 (F)	Mat E 3410 (F)	Mat E 3510 (F)
Mat E 3220 (S)	Mat E 3420 (S)	Mat E 3500 (S)
Mat E 4250 (F)	Mat E 4430 (F)	Mat E 4530 (F)
Mat E 4330 (S)	Mat E 4440 (S)	Mat E 4540 (S)

GENERAL EDUCATION (GEN ED) ELECTIVES ACCEPTABLE FOR MATERIALS ENGINEERING CURRICULUM

Materials engineering students are encouraged to select Gen Ed courses that broaden their academic program. Courses in the social sciences (sociology, anthropology, journalism and mass communication, economics, political science, human development and family studies, psychology) or humanities (architecture, literature, foreign language, philosophy, religion, history) are especially encouraged.

All materials engineering majors must take 12 credits of Gen Ed courses. The university requirements for U.S. Cultures and Communities and International Perspectives must be met, and can be met through the courses selected in the Gen Ed requirement.

Any university course may be taken to fulfill the Gen Ed requirements, as long as it meets the following rules:

1. The course may not be remedial - courses must be at the 1000+ level.

2. The course may not be offered in engineering, physics, chemistry, or mathematics.

3. You may not use an orientation course from another department (e.g. BUSAD 1030).

4. The course may not be one that could have counted as a technical elective (e.g. 1000- and 2000- level BIOL courses may be used as a Gen Ed. However, a 3000+ level BIOL course may not be used as a Gen Ed since it can count as a tech elective)

5. You must complete at least 3 credits at the 2000-level or higher toward the Gen Ed requirement.

6. You may not use more than 9 credits from a single department toward the Gen Ed requirement.

7. No “skills” courses may be used. (e.g. Kinesiology courses - golf, tennis, etc. or music courses focused on playing an instrument or participating in band, choir, etc.)

APPENDIX C.1

ACCT – Accounting	FRNCH - French
ADVRT – Advertising	GEOL - Geology (100 or 200 level)
AFAM – African American Studies	GER - German
AGRON – Agronomy (100 or 200 level)	GERON - Gerontology
AFAS – Air Force Aerospace Studies	GLOBE - Global Resource Systems
AMIN – American Indian Studies	HS - Health Studies
ASL – American Sign Language	HIST - History
ANS – Animal Science	HORT - Horticulture
ANTHR – Anthropology	HDFS - Human Development and Family Studies
AESHM – Apparel, Events, and Hospitality Management	HSPM – Hospitality Management
AMD – Apparel, Merchandising and Design	INDD - Industrial Design
ARABC – Arabic	INTST – International Studies
ARCH – Architecture	JLMC - Journalism and Mass Communication
ART – Art and Design	LA - Landscape Architecture
ARTED – Art Education	LAS - Liberal Arts and Sciences
ARTGR - Graphic Design	LATIN – Latin Language
ARTH – Art History	LDST – Leadership Studies
ARTIS - Integrated Studio Arts	LING - Linguistics
ARTID - Interior Design	MGMT - Management
ASTRO – Astronomy and Astrophysics (100 or 200 level)	MIS - Management Information Systems
ATR - Athletic Training	MKT - Marketing
BBMB - Biochemistry, Biophysics, and Molecular Biology (100 or 200 level)	MTEOR – Meteorology (100 or 200 level)
BCBIO - Bioinformatics and Computational Biology (100 or 200 level)	MICRO – Microbiology (100 or 200 level)
BPMI - Biological/Pre-Medical Illustration	MS - Military Science
BIOL - Biology (100 or 200 level) + Biol 307	MUSIC (see advisor for courses allowed)
CHIN - Chinese	NREM - Natural Resource Ecology and Management
CLST - Classical Studies	NS - Naval Science
CMDIS - Communication Disorders	PHIL - Philosophy
COMST - Communication Studies	POLS - Political Science
CRP - Community and Regional Planning	PORT - Portuguese
COMS - Computer Science (200 level)	PSYCH - Psychology
CJ - Criminal Justice	RELIG - Religious Studies
DES - Design	RUS - Russian Language
DS – Data Science (200 level)	SCM - Supply Chain Management
DSNS - Design Studies	SOC - Sociology
ECON - Economics	SPAN - Spanish
ENGL - English	SP ED - Special Education
ENSCI - Environmental Science (200 level)	SPCM - Speech Communication
ENVS - Environmental Studies	THTRE - Theatre
EVENT - Event Management	USLS – U.S. Latino/a Studies Program
FCEDS - Family and Consumer Sciences Education and Studies	WGS – Women's and Gender Studies
FIN - Finance	WLC - World Languages and Cultures
FSHN - Food Science and Human Nutrition	WFS -World Film Studies
FOR - Forestry (100 or 200 level)	

Common Gen Ed Courses Taken by Mat E Undergraduates

Use this as a starting point, but there are many other options for courses if these do not appeal to you – see rules on page 17-18 for details.

ACCT 2840. Financial Accounting

(3-0) Cr. 3. F.S.SS.
Introduction to the basic concepts and procedures of financial accounting from a user perspective. The course examines the accounting cycle, business terminology, basic control procedures, and the preparation and evaluation of financial reports, with an emphasis on financial statement analysis.

AFAM 2010. Introduction to African American Studies

(3-0) Cr. 3. F.S.
An interdisciplinary introduction to the study of African American culture. Includes history, the social sciences, literature, religion, and the arts, as well as conceptual frameworks for investigation and analysis of the African American experience.
Meets U.S. Cultures and Communities.

AMIN 2100. Introduction to American Indian Studies

(3-0) Cr. 3. F.S.SS.
Introduction to the multidisciplinary aspects of American Indian Studies. Topics include the relevant events and ideas defining the contemporary American Indian experience, on and off reservation, in the United States. Sovereignty, identity, jurisdiction, taxes, economic development, education, and other issues are addressed.
Meets U.S. Cultures and Communities.

ANTHR 2010. Introduction to Cultural Anthropology

(3-0) Cr. 3. F.S.SS.
Introduction to the core concepts, theories, and methods of cultural anthropology with an emphasis on understanding human cultural diversity in global society from an anthropological perspective.
Meets International Perspectives Requirement.

ANTHR 2200. Globalization and Sustainability

(Cross-listed with ENVS, GLOBE, ME, MATE, SOC, TSC). (3-0) Cr. 3. F.S.
An introduction to understanding the key global issues in sustainability. Focuses on interconnected roles of energy, materials, human resources, economics, and technology in building and maintaining sustainable systems. Applications discussed will include challenges in both the developed and developing world and will examine the role of technology in a resource-constrained world. Cannot be used for technical elective credit in any engineering department.
Meets International Perspectives Requirement.

ANTHR 2300. Globalization and the Human Condition

(3-0) Cr. 3. F.S.
An introduction to understanding key global issues in the contemporary world. Focuses on social relations, cultural practices and political-economic linkages among Africa, the Americas, Asia, Europe and the Pacific.
Meets International Perspectives Requirement.

ASTRO 1200. The Sky and the Solar System.

(3-0) Cr. 3. F.S.SS.
For the nonscientist. A survey of our view of the universe, and the exploration of the solar system and beyond. The sky: constellations; motions of the Sun, Moon, and planets; seasons and the calendar; eclipses. The solar system: origin and evolution; characteristics of the Sun, planets, satellites, comets, meteorites, and asteroids. The detection and characterization of other solar systems, and the search for life in the universe. Extensive use of the planetarium is included. Students who take Astro 1200 may count credit in only one of ASTRO 1020 or 1030 toward graduation.

ASTRO 1500. Stars, Galaxies, and Cosmology.

(3-0) Cr. 3. F.S.
For the nonscientist. A survey of astronomy with a focus on the universe beyond our solar system. Basic observational astronomy and the history of astronomy. Stellar astronomy: motions, distances, sizes, spectra; types of stars; variability; binary systems. Stellar evolution: the birth, life, and death of stars, including supernovae, neutron stars, and black holes. The structure and evolution of the Milky Way Galaxy. Other galaxies, clusters of galaxies, quasars. Theories of the origin of the universe.

BIOL 1010. Introductory Biology.

(3-0) Cr. 3. F.S.SS.
Life considered at cellular, organism, and population levels. Function and diversity of the living world. Presentation of basic biological principles as well as topics and issues of current human interest. Does not satisfy biology major requirements.

BIOL 2110. Principles of Biology I.

(3-0) Cr. 3. F.S. *Prereq: High school biology*
Introduction to the nature of life, including the diversity of microbial, plant, and animal life; the nature of heredity; evolution; and principles of ecology. Intended for life science majors.

BIOL 2120. Principles of Biology II.

(3-0) Cr. 3. F.S. *Prereq: High School Biology; High School Chemistry or credit or enrollment in CHEM 1630 or CHEM 1770*
Introduction to the chemical, molecular, and cellular basis of life; form and function of microbial, plant, and animal life. Intended for life science majors. HS courses in biology and chemistry necessary. Credit or enrollment in CHEM 1630 or CHEM 1770 recommended.

BIOL 2550. Fundamentals of Human Anatomy.

(3-0) Cr. 3. F. *Prereq: High School Biology and Chemistry, or BIOL 101*
An introduction to human anatomy, beginning with cells and tissues, surveying all body systems, relating form to function. Systems covered include: integumentary, bones and joints, muscles, nervous, sensory, endocrine, circulatory, lymphatic, respiratory, digestive, urinary, and reproductive. Pre-Medical students should consider BIOL 3510 for their anatomy background. Does not satisfy biology major requirements. HS courses in biology and chemistry necessary. Credit or enrollment in BIOL 1010 recommended

BIOL 2560. Fundamentals of Human Physiology.

(3-0) Cr. 3. S. *Prereq: High School Biology and Chemistry*
An introduction to human physiology, studying the function of all body systems. Systems covered include: integumentary, bones and joints, muscles, nervous, sensory, endocrine, circulatory, lymphatic and immune, respiratory, digestive, urinary, and reproductive. Does not satisfy biology major requirements. HS courses in biology and chemistry necessary. Credit or enrollment in BIOL 1010 or BIOL 2550 recommended.

CLST 2730. Greek and Roman Mythology.

(3-0) Cr. 3.
Survey of the legends, myths of the classical world with emphasis on the principal gods, and heroes, and their relation to ancient social, psychological, and religious practices; some attention may be given to important modern theories.
Meets International Perspectives Requirement.

COMST 2110. Interpersonal Communication.

(3-0) Cr. 3.
Apply interpersonal communication theory and concepts to daily interactions. Develop knowledge and skills such as listening and responding, conversation management, using and interpreting nonverbals, conflict resolution, among others. Build skills leading to effective interactions in friendships, romances, families, and the workplace.

COMST 2140. Professional Communication.

(3-0) Cr. 3.
Develop verbal and nonverbal communication competence in organizational settings, with a particular emphasis on interpersonal skills, salary negotiation, team and meeting facilitation, informational interviewing, and team presentations.

COMS 2070. Fundamentals of Computer Programming.

(3-1) Cr. 3. F.S. *Prereq: MATH 1500 or placement into MATH 1400 or higher*
An introduction to computer programming using an object-oriented programming language. Emphasis on the basics of good programming techniques and style. Extensive practice in designing, implementing, and debugging small programs. Use of abstract data types. Interactive and file I/O. Exceptions/error-handling. This course is not designed for computer science, software engineering, and computer engineering majors. Credit may not be applied toward graduation for both COMS 2070 and COMS 2270.

COMS 2270. Object-oriented Programming.

(3-2) Cr. 4. F.S.SS.
Credit or concurrent enrollment in MATH 1430 or higher; (COMS 1270 or CPRE 1850 or SE 1850 or EE 2850)
Computer programming using objects as the mechanism for modularity, abstraction, and code reuse. Instance variables, methods, and encapsulation. Review of control structures for conditionals and iteration. Developing algorithms on strings, arrays, and lists. Recursion, searching, and sorting. Text parsing and file I/O. Interfaces, inheritance, polymorphism, and abstract classes. Exception handling. Tools for unit testing and debugging. Emphasis on a disciplined approach to specification, code development, and testing. Course intended for majors in computer science and related fields. Credit may not be applied toward graduation for both COMS 2070 and 2270.

ECON 1010. Principles of Microeconomics.

(3-0) Cr. 3. F.S.SS.
Resource allocation, opportunity cost, comparative and absolute advantage. Supply and demand. Marginal analysis. Theories of production and consumption, pricing, and the market system. Perfect and imperfect competition and strategic behavior. Factor markets. Present discounted value.

ECON 1020. Principles of Macroeconomics.

(3-0) Cr. 3. *Prereq: ECON 1010 recommended*
Measurement of macro variables and general macro identities. Classical models of full employment. Production and growth. Savings and investment. Employment and unemployment.

Money, inflation, and price levels. Operation of the U.S. banking system. Fiscal and monetary policy. Elements of international finance.

GEOL 1000. How the Earth Works.

(3-0) Cr. 3. F.S.SS.
How does the earth work, what is it made of, and how does it change through time? Plate tectonics, Earth materials, landforms, structures, climate, and natural resources. Emphasis on the observations and hypotheses used to interpret earth system processes. Students may also enroll in Geol 100L.

GEOL 1010. Environmental Geology: Earth in Crisis.

(Cross-listed with ENVS). (3-0) Cr. 3. F.S.SS.
Exploration of the interactions between humans and the geologic environment, and the consequences of those interactions, on local to global scales. Discussion of water, soil, mineral, and energy resources, pollution, climate change, and natural hazards such as earthquakes, volcanism, mass wasting, and flooding.

HDFS 2400. Children's Literature.

(3-0) Cr. 3. F.S.
Evaluation of literature for children with emphasis on diversity and inclusion. Role of literature in the development of children across contexts
Meets U.S. Cultures and Communities.

HDFS 2760. Human Sexuality.

(3-0) Cr. 3. F.S.SS.
Behavioral, biological, and psychological aspects of human sexuality within the social context of family, culture, and society. Role of sexuality in human development. Critical analysis of media and research. Communication and decision-making skills relating to sexuality issues and relationships.
Meets U.S. Cultures and Communities.

HIST 2010. Introduction to Western Civilization I.

(3-0) Cr. 3. F.
Western civilization from ancient Mediterranean world to 1500. Social and cultural developments; economic and political ideas and institutions; problems of historical change and continuity.
Meets International Perspectives Requirement.

HIST 2020. Introduction to Western Civilization II.

(3-0) Cr. 3. S.
Western civilization from 1500 to present. Social and cultural developments; economic and political ideas and institutions; problems of historical change and continuity.
Meets International Perspectives Requirement.

HIST 2210. Survey of United States History I.

(3-0) Cr. 3-5. F.
Colonial foundations: revolution, confederation, and constitution; nationalism and democracy; sectional disunity, Civil War, and reunion.

HIST 2220. Survey of United States History II.

(3-0) Cr. 3. S.
Industrialization; emergence as a great power; boom and depression; war, internationalism and Cold War; modern industrial society.

HIST 2800. Introduction to History of Science I.

(3-0) Cr. 3. F.
Ideas of nature from ancient Greece to the seventeenth-century scientific revolution.
Meets International Perspectives Requirement.

HIST 2810. Introduction to History of Science II.

(3-0) Cr. 3. S.
Science from seventeenth-century scientific revolution to Darwin and Einstein.
Meets International Perspectives Requirement.

INTST 2350. Introduction to International Studies.

(3-0) Cr. 3. F.SS.
Overview of international studies, emphasizing cultural, geographic, economic, and political characteristics of major world areas and nations.
Meets International Perspectives Requirement.

LDST 3220: Leadership in a Diverse Society

(3-0) Cr. 3. F.S.SS.
Experiential opportunity to understand, develop, and apply diversity-informed leadership practices.
Meets U.S. Cultures and Communities.

MUSIC 1020. Introduction to Music Listening.

(3-0) Cr. 3. F.S.SS.
Expansion of the music listening experiences for the general student through greater awareness of differences in techniques of listening, performance media, and materials of the art. The course focuses on the elements of music: rhythm, melody, harmony, form, and style, and how these elements are used in musics of different cultures and time periods. Ability to read or perform music not required.
Meets International Perspectives Requirement.

MUSIC 3040. History of Rock 'n' Roll.

(3-0) Cr. 3. F.S
Rock 'n' Roll from the mid 1950s through the present, focusing on the development of rock styles from its roots in blues and folk music. Explores the various overlaps and cross-overs with other musical traditions including hip-hop, country, and pop. Expansion of listening experience through study of song forms, musical instruments of rock, and socio-political influences. Quizzes and examinations required. Ability to read or perform music not required.

PHIL 2010. Introduction to Philosophy.

(3-0) Cr. 3. F.S.SS.
It has been rumored that the unexamined life is not worth living. Philosophy is an attempt to begin examining life by considering such questions as: What makes us human? What is the world ultimately like? How should we relate to other people? Is there a god? How can we know anything about these questions? Understanding questions of this kind and proposed answers to them is what this course is all about.

PHIL 2300. Moral Theory and Practice.

(3-0) Cr. 3. F.S.SS.
Investigation of moral issues in the context of major ethical theories of value and obligation; e.g., punishment, abortion, economic justice, job discrimination, world hunger, and sexual morality. Emphasis on critical reasoning and argument analysis.

PHIL 2350. Ethical Issues in A Diverse Society.

(3-0) Cr. 3. F.S.
This course will examine a range of arguments on diversity issues. Topics will include: the social status of women, the moral status of sexuality and homosexuality, the nature and role of racism in contemporary society, the relationship between biology, gender roles and social status, and various proposals for change from a variety of political perspectives.
Meets U.S. Cultures and Communities.

POLS 1110. Introduction to American Government.

(3-0) Cr. 3. F.S.
Fundamentals of American democracy; constitutionalism; federalism; rights and duties of citizens; executive, legislative, and judicial branches of government; elections, public opinion, interest groups, and political parties.

POLS 1210. Introduction to International Politics.

(3-0) Cr. 3. F.S.
Dynamics of interstate relations pertaining to nationalism, the nation state; peace and war; foreign policy making; the national interest; military capability and strategy; case studies of transnational issues, such as population, food, energy, and terrorism.
Meets International Perspectives Requirement.

POLS 1210. Introduction to International Politics.

(3-0) Cr. 3. F.S.
Dynamics of interstate relations pertaining to nationalism, the nation state; peace and war; foreign policy making; the national interest; military capability and strategy; case studies of transnational issues, such as population, food, energy, and terrorism.
Meets International Perspectives Requirement.

POLS 1250. Democracy and Dictatorship: Introduction to Comparative Government and Politics.

(3-0) Cr. 3. F.S.
Interactions between governments and citizens in countries outside the US. Causes of democracy, dictatorship, and economic and social development.
Meets International Perspectives Requirement.

PSYCH 1010. Introduction to Psychology.

(3-0) Cr. 3. F.S.SS.
Fundamental psychological concepts derived from the application of the scientific method to the study of behavior and mental processes. Applications of psychology.

PSYCH 2300. Developmental Psychology.

(3-0) Cr. 3. F.S.SS.
Life-span development of physical traits, cognition, intelligence, language, social and emotional behavior, personality, and adjustment.

PSYCH 2800. Social Psychology.

(3-0) Cr. 3. F.S.SS.
Individual human behavior in social contexts. Emphasis on social judgments and decisions, attitudes, perceptions of others, social influence, aggression, stereotypes, and helping.

RELIG 2050. World Religions.

(3-0) Cr. 3. F.S.SS.
An introduction to religious studies – the academic study of religion. Religions from around the world will be discussed, including their myths, rituals, beliefs, values, and social forms.
Meets International Perspectives Requirement.

RELIG 2100. Religion in America.

(3-0) Cr. 3. F.S.SS.
Introductory study of the major beliefs, practices, and institutions of American Judaism, Catholicism, Protestantism, and Islam with emphasis on the diversity of religion in America, and attention to issues of gender, race, and class.
Meets U.S. Communities and Cultures

SOC 1340. Introduction to Sociology.

(3-0) Cr. 3. F.S.SS.
Social interaction and group behavior with emphasis on the scientific study of contemporary U.S. society, including issues relating to socialization, inequality, and changing rural and urban communities. Analysis of relationships among the institutions of family, religion, political participation, work, and leisure.

SOC 2190. Sociology of Intimate Relationships.

(3-0) Cr. 3. F.S. *Prereq: SOC 1340*
Exploration of families and intimate relationships using a sociological perspective, with the goal to help students make informed and intentional choices in their relationships across the life course. Topics covered include family definitions and theories, sexuality, singlehood, dating, cohabitation, marriage, parenting, divorce, stepfamilies, and aging. Relationship quality, communication, conflict, and work-life balance will also be examined, as well as differences in family dynamics by gender, race and ethnicity, and class.

SOC 2200. Globalization and Sustainability.

(Cross-listed with ANTHR, ENVS, GLOBE, ME, MATE). (3-0) Cr. 3. F.S.
An introduction to understanding the key global issues in sustainability. Focuses on interconnected roles of energy, materials, human resources, economics, and technology in building and maintaining sustainable systems. Applications discussed will include challenges in both the developed and developing world and will examine the role of technology in a resource-constrained world. Cannot be used for technical elective credit in any engineering department.
Meets International Perspectives Requirement.

SOC 2350. Social Problems and American Values.

(3-0) Cr. 3. F.S. *Prereq: SOC 1340*
Explores relationship between contemporary social problems and American values. Explores how contradictory values impede political consensus while complicating our ability to define and solve social problems. Discussion may focus upon: working conditions, income and wealth, poverty and welfare, impacts of technology on society, criminal justice and victimization, reproductive rights and gender, child rearing and education, immigration and race, guns and violence, and environment and climate change.
Meets U.S. Cultures and Communities.

SPCM 2120. Fundamentals of Public Speaking.

(3-0) Cr. 3. F.S.SS.
Theory and practice of basic speech communication principles applied to public speaking. Practice in the preparation and delivery of extemporaneous speeches.

SPCM 2160. America Speaks: Great Speakers and Speeches in US History.

Cr. 3.
Survey of great speeches examined within their political and cultural contexts. Analysis of the rhetorical strategies of diverse speakers with an emphasis on texts from social movements in the United States.
Meets U.S. Cultures and Communities.

SPCM 3120. Business and Professional Speaking.

(3-0) Cr. 3. F.S.
Theory, principles, and competency development in the creation of coherent, articulate business and professional oral presentations. SPCM 2120 or prior public speaking experience recommended.

THTRE 1100. Theatre and Society.

(3-0) Cr. 3. F.S.
An introduction to Theatre focusing on its relationship with society throughout history.

THTRE 2510. Acting Foundations.

(3-0) Cr. 3. F.S.
Theory and practice in fundamentals of acting.

TECHNICAL ELECTIVES

Any 3000+ level course in the departments listed below.

However, you **cannot** use the following courses to meet this requirement:

- 4900/4990/5900 course in any department
- BIOL 3070 (cross-listed with WS)
- ME 4840/5840 (cross-listed with WLC)
- STAT 3050

AERE – Aerospace Engineering
ABE – Agricultural and Biosystems Engineering
ASTRO – Astronomy and Astrophysics
BBMB – Biochemistry, Biophysics, and Molecular Biology
BME – Biomedical Engineering
BIOL – Biology
CE – Civil Engineering
CHE – Chemical Engineering
CHEM – Chemistry
COMS – Computer Science
CONE – Construction Engineering
CPRE – Computer Engineering
EE – Electrical Engineering
EM – Engineering Mechanics
ENSCI – Environmental Science
(not to be confused with ENVS – Environmental Studies – which cannot be used as a tech elective)
GEN – Genetics
GEOL – Geology
IE – Industrial Engineering
MATH – Mathematics
MATE – Materials Engineering
ME – Mechanical Engineering
MICRO – Microbiology
MSE – Materials Science & Engineering (graduate-level courses)
PHYS – Physics
SE – Software Engineering
STAT – Statistics

Additionally, the following 2000-level courses may be used toward this requirement:

- MATH 2070
- BME 2200

Recommendations for Technical Electives

If you are interested in metals…

- MATE 3340 (S) – Electronic & Magnetic Properties of Metallic Materials
- IE/MATE 3480 (S) – Solidification Processes
- MATE 3620 (F,S) – Principles of Nondestructive Testing

If you are interested in polymers…

- CHE 4470 (S) – Polymers and Polymer Engineering
- AERE 4230 (S) – Composite Flight Structures
- MATE 4560 (F) - Biomaterials

If you are interested in electronic properties of materials…

- MATE 3340 (S) – Electronic & Magnetic Properties of Metallic Materials
- MATE 4330 (S) – Advanced Ceramics and Electronic Materials
- MATE 3320 (S) – Semiconductor Materials and Devices
- MATE 4320 (F,S) – Microelectronics Fabrication Techniques

If you are interested in biomaterials…

- MATE 4560 (F) – Biomaterials
- CHE 4400 (F) – Biomedical Applications of Chemical Engineering
- Consider the Biomedical engineering minor

If you are interested in business applications in engineering…

- IE 3050 (F, S, SS) – Engineering Economic Analysis
- IE 4500 (F) – Technical Sales for Engineers

To prepare for graduate school in Materials Science & Engineering…

- MATH 3850 (F, S) – Introduction to Partial Differential Equations
- PHYS 3210 (F) – Introduction to Modern Physics I
- PHYS 3220 (S) – Introduction to Modern Physics II
- Any MSE 5000+ level graduate course

UNDERGRADUATE STUDENT ORGANIZATIONS

MATERIAL ADVANTAGE (ACerS, ASM, and TMS combined)

https://stuorgs.engineering.iastate.edu/material-advantage/

PRESIDENT.....Dylan Jacks
VICE PRESIDENT.....Henry Devenport and Arush Naik
TREASURER.....Joshua Aardahl
SECRETARY.....Ray Jensen
OUTREACH CHAIRS.....Charlie Frayman and Jordan Ryner
FRESHMAN OUTREACH ……..Ryan Kadavy and Peer Mentors
SOPH OUTREACH .....Ryan Kadavy
JUNIOR OUTREACH …….Jozie Hammortree
SENIOR OUTREACH …….Unappointed
GRAD OUTREACH ……Jordan Steinmetz
RISK MANAGEMENT....……Evan Birky
SOCIAL CHAIR.....Maria Wagner
PR CHAIR.....Unappointed
FUNDRAISING CHAIR……...Jozie Hammortree and Jack Page
MATERIAL ADVANTAGE CAMP Erik DeMeyere
FACULTY ADVISOR.....Dr. Sid Pathak

METALLURGICA

https://www.stuorg.iastate.edu/2653

PRESIDENT……..Tate Solveson
TREASURER…….....Micah Vemu
HEALTH & SAFETY OFFICER…..Jorllette Carrera-Saenz
FACULTY ADVISOR……...Dr. Pete Collins