

Materials Science & Engineering

- Bachelor of Science (B.S.)
- Program Curriculum



Mathematics/Science coursework **28-31 cr.**

CHEM 1110 - General Chemistry I &	
CHEM 1120 - General Chemistry II or	8 cr.
CHEM 1130 - General Chemistry I & II	5 cr.
• course also satisfies UNIFI Scientific Reasoning requirement.	
MATH 1420 - Calculus I	4 cr.
• course also satisfies UNIFI Quantitative Reasoning requirement.	
MATH 1421 - Calculus II	4 cr.
MATH 2422 - Calculus III	4 cr.
PHYSICS 1701 - Physics I for Science & Engineering	4 cr.
• course also satisfies UNIFI Scientific Reasoning requirement.	
PHYSICS 1702 - Physics II for Science & Engineering	4 cr.
PHYSICS 2700 - Mathematical Methods of Sci. & Eng. or	
MATH 3425 - Differential Equations	3 cr.

Materials Science & Engineering Core **51 cr.**

CHEM/PHYSICS 4200 - Nanoscience	3 cr.
ENGR 1000 - Introduction to Eng. & Professional Practice	3 cr.
ENGR 2080 - Statics	2 cr.
ENGR 2089 - Engineering Seminar	1 cr.
ENGR 2180 - Strength of Materials	2 cr.
ENGR 4235 - Material Transformation & Modeling	3 cr.
ENGR 4500 - Senior Design	3 cr.
PHIL 1560 - Science, Technology & Ethics	3 cr.
• course also satisfies UNIFI Responsibility requirement.	
PHYSICS 4750 - Physics of Modern Materials	3 cr.
PHYSICS 4760 - Computational Materials Science	3 cr.
PHYSICS 4900 - Thermodynamics & Statistical Mechanics	4 cr.
STAT 3751 - Probability & Statistics	3 cr.
TECH 1024 - Engineering Design with CAD	3 cr.
TECH 2072 - Engineering Materials	3 cr.
TECH 3127 - Applied Thermodynamics	3 cr.
TECH 3132 - Metallurgy & Phase Transformation	3 cr.
TECH 3136 - Principles of Metal Casting	3 cr.
TECH 3192 - Non-Destructive Evaluation of Materials	3 cr.

Technical Writing requirement **3 cr.**

ENGLISH 3772 - Technical Writing for Eng. Technologists	3 cr.
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Technical Electives **12 cr.**

Students are required to complete 12 credits of coursework approved by their academic advisor.

UNI Foundational Inquiry **37 cr.**

Written Communications	3 cr.
Oral Communications	3 cr.
Quantitative Reasoning	3 cr.
• requirement completed with MATH 1420.	
Human Condition (Domestic)	3 cr.
Human Condition (Global)	3 cr.
Scientific Reasoning	4 cr.
• requirement completed with PHYSICS 1701.	
Human Expression	3 cr.
Responsibility	3 cr.
• requirement completed with PHIL 1560.	
UNIFI Elective	3 cr.
• requirement completed with CHEM 1110 or CHEM 1130.	
UNIFI Elective	3 cr.
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Inspired by the University of Northern Iowa mission to engage students in high-quality and high-impact learning experiences within a challenging and supportive environment, UNI's new general education requirements are designed to ensure that students' foundational learning experiences lead to a lifetime full of potential. For more information, visit unifi.uni.edu.

Credit Totals

Math/Science coursework	28 cr.
Materials Science & Engineering Core	51 cr.
UNI Foundational Inquiry (UNIFI)	37 cr.
Technical Writing requirement	3 cr.
Technical Electives	12 cr.
Credits counted twice (major & UNIFI)	-13 cr.
Total	118 cr.
University Electives needed	2 cr.
Grand Total	120 cr.

Department of Applied Engineering

University of Northern Iowa
Applied Engineering Building
Cedar Falls, IA 50614-0178
Phone: (319) 273-2561 || E-mail: appliedengineering@uni.edu

Important ALEKS Test Information

The ALEKS test is a math placement test that all UNI students must complete prior to enrolling in certain math & science courses. Below are the scores required for the math & science requirements in this program:

- CHEM 1110: 55
- MATH 1420: 76

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Example course sequence for *first-year, freshmen* students

Fall 1		Spring 1	
CHEM 1110 - General Chemistry I [*]	3 cr.	UNIFI Written Communication course	3 cr.
MATH 1420 - Calculus I [*]	4 cr.	CHEM 1120 - General Chemistry II [*]	4 cr.
PHYSICS 1701 - Physics I for Science & Engineering ^{FO}	4 cr.	MATH 1421 - Calculus II [*]	4 cr.
ENGR 1000 - Introduction to Engineering	3 cr.	PHYSICS 1702 - Physics II for Science & Engineering ^{SO}	4 cr.
Total: 14 cr.		Total: 14 cr.	
Fall 2		Spring 2	
UNIFI Oral Communication course	3 cr.	UNIFI elective course	3 cr.
MATH 2422 - Calculus III [*]	4 cr.	TECH 2072 - Engineering Materials ^{SO}	3 cr.
TECH 1024 - Engineering Design with CAD ^{FO}	3 cr.	ENGR 2180 - Strength of Materials [*]	2 cr.
ENGR 2080 - Statics [*]	2 cr.	PHYSICS 2700 - Mathematics Methods of Science & Engineering ^{SO}	3 cr.
ENGT 2089 - Engineering Seminar [*]	1 cr.	STAT 3751 - Probability & Statistics ^{SO}	3 cr.
ENGLISH 3772 - Technical Writing for Eng. Technologists [*]	3 cr.	Technical elective course	3 cr.
Total: 17 cr.		Total: 17 cr.	
Fall 3		Spring 3	
UNIFI Human Condition (Global) course	3 cr.	UNIFI Human Expression course	3 cr.
UNIFI Human Condition (Domestic) course	3 cr.	UNIFI elective course	3 cr.
TECH 3132 - Metallurgy & Phase Transformation [*]	3 cr.	TECH 3127 - Applied Thermodynamics ^{SO}	3 cr.
CHEM 4200 - Nanoscience ^{FO}	3 cr.	TECH 3192 - Non-Destructive Evaluation of Materials [*]	3 cr.
Technical elective course	3 cr.	PHYSICS 4900 - Thermodynamics & Statistical Mechanics ^{SO}	4 cr.
Total: 15 cr.		Total: 16 cr.	
Fall 4		Spring 4	
PHIL 1560 - Science, Technology & Ethics	3 cr.	UNIFI elective course	3 cr.
TECH 3136 - Principles of Metal Casting ^{FO}	3 cr.	PHYSICS 4760 - Computational Materials Science ^{SO}	3 cr.
ENGR 4235 - Material Transformation & Modeling [*]	3 cr.	ENGR 4500 - Senior Design [*]	3 cr.
PHYSICS 4750 - Physics of Modern Materials ^{FO}	3 cr.	Technical elective course	3 cr.
Technical elective course	3 cr.	University elective course	2 cr.
Total: 15 cr.		Total: 14 cr.	

Legend

^{*} - course requires a prerequisite.

^{SO} - course requires a co-requisite.

^{FO} - course is only offered in the fall.

^{SO} - course is only offered in the spring.

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