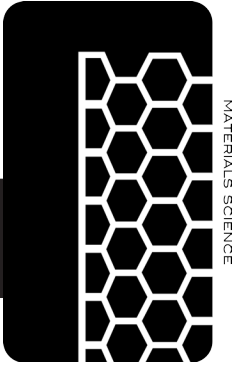


MSNE

Materials Science and
NanoEngineering

WEB LINKS	http://msne.rice.edu
FRANK ADVICE	Many MSNE students pursue graduate degrees in top graduate schools after earning their B.S. degree, so undergraduate research experiences are quite important. Research intern experiences also help students obtain industrial jobs after graduation.
ADVICE FOR STUDENTS WITH AP CREDIT	Students with AP credit for calculus would do well to move the MATH and CAAM sequence up. If the CAAM sequence can be fully completed in the sophomore year, this reduces the junior year pressure and also allows for more opportunities to participate in undergraduate research.
ALTERNATIVE CURRICULA	Not applicable.
BS VERSUS BA	Students are encouraged to pursue the B.S. degree instead of the B.A. degree, especially those who plan to pursue a graduate degree or practice engineering.
NOT REQUIRED BUT HIGHLY RECOMMENDED COURSES	See the undergraduate program page on our website, http://msne.rice.edu



<p>RESEARCH</p>	<p>Many MSNE majors participate in undergraduate research; some even start during their freshman year. To get involved, speak to a MSNE undergraduate adviser or directly to a MSNE faculty member.</p>
<p>INTERNSHIPS</p>	<p>Summer research internships are often available through individual MSNE research labs, as well as universities abroad. Many students also pursue industrial or government lab internships as well. Notices are posted to the MSNE undergrad email list.</p>
<p>STUDY ABROAD</p>	<p>Study abroad is most feasible in the fall semester of the sophomore and junior years. This avoids potential conflicts with lab classes and the year-long senior design sequence.</p>
<p>PROFESSIONAL ORGANIZATIONS</p>	<p>American Ceramic Society (ACerS) ceramics.org Association for Iron & Steel Technology (AIST) aist.org ASM International asminternational.org The Minerals, Metals, and Materials Society (TMS) tms.org Rice Undergraduate Materials Science and NanoEngineering Society materialsociety.blogs.rice.edu Rice Center for Engineering Leadership(RCEL) rcel.rice.edu</p>
<p>INTERESTING COURSES FOR NON-MAJORS</p>	<p>MSNE 201 Introduction to NanoEngineering MSNE 301 Materials Science MSNE 402 Mechanical Properties of Materials MSNE 406 Physical Properties of Solids MSNE 435 Crystallography and Diffraction</p>

B.S. In Materials Science and NanoEngineering

Specializations: None Available. Students select specialization electives to suit their academic interests and career plans.

Engineering

Sciences Electives: At least three electives for a total of 9 hours of credit approved by a department academic adviser. One basic Math & Science selected elective at the 200 level or higher (no MSNE or Engineering selected electives), one engineering selected elective (no MSNE) and two Technical selected electives (MSNE or Engineering selected electives).

Sample Degree Plan

THIS IS ONE EXAMPLE OF MANY POSSIBLE SCHEDULES.

CONSULT A DIVISIONAL OR DEPARTMENTAL ADVISER TO CUSTOMIZE YOUR DEGREE PLAN.

FALL				SPRING			
FRESHMAN		18 credits		FRESHMAN		17 credits	
MATH 101	Single Variable Calculus I	3		MATH 102	Single Variable Calculus II	3	
CHEM 121	General Chem I w/Lab	4*		CHEM 122	General Chem II w/Lab	4*	
PHYS 101•	Mechanics w/Lab	4*		PHYS 102•	Electr & Magnetism w/Lab	4*	
	or 111				or 112		
MSNE 201	Introduction to NanoEngineering	3		OPEN	Open elective	3	
FWIS	Freshman Writing	3		DIST	Distribution elective	3	
LPAP	Lifetime Phys Activity elective	1					
SOPHOMORE		15 credits		SOPHOMORE		18 credits	
MATH 211	Ord Diff Eqs & Linear Algebra	3		MATH 212	Multivariable Calculus	3	
PHYS 201	Waves & Optics	3		CAAM 210	Intro to Eng Computation	3	
	or CHEM 211/ 311			DIST	Distribution elective	3	
SPEC	Technical selected elective	3		DIST	Distribution elective	3	
MSNE 301	Materials Science	3		SPEC	Technical selected elective	3	
DIST	Distribution elective	3		OPEN	Open elective	3	
JUNIOR		16 credits		JUNIOR		14 credits	
CAAM 335	Matrix Analysis	3		MSNE 302	Materials Processing	3	
MSNE 401	Thermodynamics in Mat Sci	3		MSNE 303	Materials Science Junior Lab	1	
MSNE 406	Physical Properties of Solids	3		MSNE 311	Materials Selection and Design	4	
MSNE 415	Ceramics and Glasses	3		MSNE 411	Mtlography & Phase Relations	3	
MSNE 451	Materials Science Seminar	1		OPEN	Open elective	3	
DIST	Distribution elective	3					
SENIOR		16 credits		SENIOR		16 credits	
MSNE 402	Mechanical Properties of Materials	3		MSNE 408	Capstone Design II	3	
MSNE 407	Capstone Design I	4		MSNE 435	Crystallography and Diffraction	3	
MSNE 450	Materials Science Seminar	0		MSNE 437	Materials Science Senior Lab	1	
SPEC	Engineering selected elective	3		OPEN	Open elective	3	
SPEC	Math and Sci selected elective	3		OPEN	Open elective	3	
DIST	Distribution elective	3		OPEN	Open elective	3	

* In addition to class hours, these courses have a regularly scheduled lab and/or discussion session that must fit into your schedule.

• When registering for PHYS 101, you must also register for PHYS 103, the discussion section for 101.

•• When registering for PHYS 102, you must also register for PHYS 104, the discussion section for 102.

§ When registering for CHEM 211, you must also register for CHEM 213, the discussion section for 211.

BASIC REQUIREMENTS	General math & science courses	37
	Core courses in major	41
ELECTIVE REQUIREMENTS	Specialization electives	12
	Open electives and LPAP	19
	FWIS and distribution courses	21
Minimum credit required for the B.S.		130

Of the 130 total credits, the B.S. in Materials Science and NanoEngineering requires 78 credits in general math and science courses and core courses.

Major Requirements

NUMBER	CREDIT	TITLE
MATH 101	3	Single Variable Calculus I
MATH 102	3	Single Variable Calculus II
MATH 211	3	Ordinary Differential Equations & Linear Algebra
MATH 212	3	Multivariable Calculus
PHYS 101*/111	4*	Mechanics w/Lab
PHYS 102**/112	4*	Electricity and Magnetism w/Lab
CHEM 121/123	4*	General Chemistry I w/Lab
CHEM 122/124	4*	General Chemistry with II Lab
CAAM 210	3	Introduction to Engineering Computation
CAAM 335	3	Matrix Analysis
PHYS 201/CHEM 211/311	3	Waves and Optics/Organic Chemistry/Physical Chemistry
MSNE 201	3	Introduction to NanoEngineering
MSNE 301	3	Materials Science
MSNE 302	3	Materials Processing
MSNE 303	3	Materials Science Junior Lab
MSNE 311	4	Materials Selection & Design
MSNE 401	4	Thermodynamics in Materials Science
MSNE 402	3	Mechanical Properties of Materials
MSNE 406	3	Physical Properties of Solids
MSNE 407	3	Capstone Design I
MSNE 408	3	Capstone Design II
MSNE 411	3	Metallography and Phase Relations
MSNE 415	3	Ceramics and Glasses
MSNE 435	3	Crystallography and Diffraction
MSNE 437	1	Crystallography & Diffraction Lab
MSNE 450	0	Materials Science Seminar
MSNE 451	1	Materials Science Seminar
Elective	3	1 approved Math and Science selected elective (no MSNE or Engineering selected electives)
Elective	6	2 approved technical selected electives (MSNE or Engineering selected electives)
Elective	3	1 approved Engineering selected elective (no MSNE)

* In addition to class hours, these courses have a regularly scheduled lab and/or discussion session that must fit into your schedule.

- When registering for PHYS 101, you must also register for PHYS 103, the discussion section for 101.
- When registering for PHYS 102, you must also register for PHYS 104, the discussion section for 102.
- § When registering for CHEM 211, you must also register for CHEM 213, the discussion section for 211.