

Materials Science and Engineering Four Year Academic Plan

Name: _____

UID: _____

Year 1	Fall		
Gateway requirements include: ENGL 101, CHEM 135, MATH 141, PHYS 161 and an approved Distributive Studies course. (Directly admitted freshman must successfully complete these courses and ENES 100 by 45 UM credits.)	Course	Credit	Grade
	ENES 102	3	
	MATH 140 (AR)	4	
	CHEM 135	3	
	CHEM 136	1	
	ENGL 101 (AW)	3	
	Total	14	

Spring		
Course	Credit	Grade
ENES 100 (SP)	3	
MATH 141	4	
PHYS 161	3	
Hist & Social Sciences (HS)*	3	
Humanities (HU)*	3	
	Total	16

Year 2	Fall		
	Course	Credit	Grade
	MATH 241	4	
	PHYS 260 and PHYS 261 (NL)	3 & 1	
	ENMA 300	3	
	ORAL COMM (OC)	3	
	Total	14	

Spring		
Course	Credit	Grade
MATH 246	3	
PHYS 270 and PHYS 271 (NL)	3 & 1	
ENMA 301	3	
CHEM 231 & 232 OR 481	3 & 1 OR 3	
	Total	14 or 13

Year 3	Fall		
Second benchmark requirements must be completed one year after students are reviewed for the gateway requirements and include: All 100 and 200 level MATH, PHYS and ENES courses; CHEM 231 and 232 OR CHEM 481; ENMA 300 and 301.	Course	Credit	Grade
	ENMA 310	3	
	ENMA 362	4	
	ENMA 460	3	
	Specialization Elective	3	
	Hist & Social Sciences (HS)*	3	
	Total	16	

Spring		
Course	Credit	Grade
ENMA 311	3	
ENMA 461	3	
ENMA 465	3	
Specialization Elective	3	
Scholarship in Practice (SP)*	3	
	Total	15

Year 4	Fall		
Third benchmark requirements must be completed one year after students are reviewed for the second benchmark and include: ENMA 460 and 461 and three additional ENMA required courses.	Course	Credit	Grade
	ENMA 463	3	
	ENMA 471	3	
	Specialization Elective	3	
	Technical Elective	3	
	Upper Level Science Elec.	3	
ENGL 393 (PW)	3		
	Total	18	

Spring		
Course	Credit	Grade
ENMA 426	3	
ENMA 490	3	
Specialization Elective	3	
Technical Elective	3	
Humanities (HU)*	3	
	Total	15

*All students must complete two Distributive Studies courses that are approved for I-series courses. The Understanding Plural Societies (UP) and Cultural Competence (CC) courses may also fulfill Distributive Studies categories.

MATERIALS SCIENCE and ENGINEERING

NAME: _____

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General Education Requirements Fundamental Studies			
Requirements	Course	Credits	Grade
Academic Writing (AW)	ENGL 101	3	
Professional Writing (PW)	ENGL 393	3	
Oral Communication (OC)		3	
Math (MA)	-----	0	
Analytic Reasoning (AR)	MATH 140	0	

Distributive Studies			
Requirements	Course	Credits	Grade
Natural Science Lab (NL)	PHYS 260&261	0	
Natural Sciences (NS)	PHYS 161	0	
History/Social Sciences (HS)		3	
History/Social Sciences (HS)		3	
Humanities (HU)		3	
Humanities (HU)		3	
Scholarship in Practice (SP)	ENES100	0	
Scholarship in Practice (SP) non major		3	

I-Series Normally double counted with Distributive Studies			
Requirements	Course	Credits	Grade
I-Series (IS)			
I-Series (IS)			

Diversity (overlap permitted with Distributive Studies and/or I-series)			
Requirements	Course	Credits	Grade
Understanding Plural Societies (UP)			
Understanding Plural Societies (UP) or Cultural Competency (CC)			

Basic Sciences			
Requirements- The cumulative average of these courses must be a 2.0		Credits	Grade
CHEM 135 - Chem for Eng		3	
CHEM 136 - Chemistry Lab for Eng		1	
PHYS 161 - General Physics I		3	
PHYS 260 and 261 - Gen Physics II & Lab		3 & 1	
PHYS 270 and 271 - Gen Physics III & Lab		3 & 1	
MATH 140 - Calculus I (AR)		4	
MATH 141 - Calculus II		4	
MATH 241 - Calculus III		4	
MATH 246 - Differential Equations		3	

Engineering Sciences			
Requirements- The cumulative average of these courses must be a 2.0		Credits	Grade
ENES 100 - Intro to Eng Design		3	
ENES 102 - Mechanics I		3	

Requirements for Graduation:	
<input type="checkbox"/> At least 30 credits must be earned at UMD	
<input type="checkbox"/> 15 of the final 30 credits must be earned at the 300-400 level	
<input type="checkbox"/> 12 upper level major credits must be earned at UMD	

Students must earn a minimum of 120 credits for the degree.

Major Requirements			
<i>The cumulative average of these courses must be a 2.0</i>		<i>Credits</i>	<i>Grade</i>
ENMA 300 - Intro to Materials Engineering	3		
ENMA 301 - Materials Emerging Tech	3		
ENMA 310 - Structural Char. Laboratory	3		
ENMA 311 - Electrical & Magnetics Lab	3		
ENMA 362 - Mechanical Properties	4		
ENMA 460 - Physics of Materials	3		
ENMA 461 - Thermodynamics	3		
ENMA 463 - Macro-processing	3		
ENMA 465 - Micro-processing	3		
ENMA 471 - Kinetics	3		
ENMA 490 - Materials Design	3		
Technical Requirements			
CHEM 231 & 232-Org Chem I or CHEM 481	3&1 OR 3		
ENMA 426 - Reliability of Materials	3		
TECH 4XX - Technical Elective*	3		
TECH 4XX - Technical Elective*	3		
SPEC 4XX - Specialization Elective*	3		
SPEC 4XX - Specialization Elective*	3		
SPEC 4XX - Specialization Elective*	3		
SPEC 4XX - Specialization Elective*	3		
SCI ELEC - Upper level Science Elective	3		

*Students should design a course program with the guidance of their advisor. Possible Electives include: **Materials Science:** ENMA 420, 421, 422, 423, 424, 425, 440, 441, 442, 462, 464, 472, 475, 481, 495, 499. **Applications of Materials & Manufacturing:** ENMA 420, 421, 422, 423, 424, 425, 440, 462, 464, 472, 481, 499, ENME, 371. **Soft Materials:** ENMA 423, 464, 475, 495, 496, 499. **Electrical and Electronic Materials:** ENMA 420, 423, 426, 441,443, 464, 475, 481, 499. **Biomaterials:** ENMA 423, 425, 441, 464, 472, 475, 495, 496, 499. **Nanotechnology:** ENMA 430, 440, 441, 442, 445, 462, 482, 489X, 499.

ENGL 393 - Technical Writing	3	
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Gateway requirements		
Requirements	Credits	Grade
ENGL 101	3	
CHEM 135, 271 or 113	3	
MATH 141	4	
PHYS 161	3	
An approved Distributive Studies course	3	
ENES 100 (required for Freshmen Direct Admits)	3	

Benchmark 2 requirements		
MATH 140, 141, 241, 246	15	
PHYS 161, 260, 261, 270 and 271	11	
CHEM 135, 136, CHEM 231 and 232 OR CHEM 481	7 - 8	
ENES 100 and 102, ENMA 300 and ENMA 301	12	

Benchmark 3 requirements		
ENMA 460, 461	6	
At least 3 required ENMA courses**	9	

** Approved by ENMA advisor