## **Materials Science and Engineering Four Year Academic Plan**

Name:\_\_\_\_\_\_ UID:\_\_\_\_\_

Year 1	Fall			
Gateway requirements include:	Course	Credit	Grade	
ENGL 101, CHEM 135, MATH 141, PHYS 161 and an approved	ENES 100 (SP)	3		
Distributive Studies course. (Directly admitted freshman must	MATH 140 (AR)	4		
	CHEM 135	3		
successfully complete these courses and ENES 100 by 45 UM	CHEM 136	1		
credits.)	ENGL 101 (AW)	3		
	ENMA 180	1		
	Total	15		

	Spring	
Course	Credit	Grade
ENES 102	3	
MATH 141	4	
PHYS 161	3 or 4	
Hist & Social Sciences (HS)*	3	
Humanities (HU)*	3	
Total	13	

Year 2		Fall		
	Course	Credit	Grade	
	MATH 241	4		
	PHYS 260 and PHYS 261 (NL)	3 & 1		
	ENMA 300	3		
	ORAL COMM (OC)	3		
	MATH 206	1		
	Total	15		

	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	
Hist & Social Sciences (HS)*	3	
Total	16 or 17	

Year 3		Fall				
	Course	Credit	Grade			
	ENMA 312 OR Upper Level					
	Science Elective	3				
	ENMA 362	3				
	ENMA 460	3				
	Specialization Elective	3				
	Scholarship in Practice (SP)*	3				
	Total	15				

	Spring	
Course	Credit	Grade
ENMA 312 OR Upper Level		
Science Elective	3	
ENMA 461	3	
ENMA 465	3	
Specialization Elective	3	
ENMA 470	3	
Total	15	

Year 4	Fall			
	Course	Credit	Grade	
	ENMA 441	3		
	ENMA 471	3		
	Specialization Elective	3		
	Technical Elective	3		
	ENGL 393 (PW)	3		
	Total	15		

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

<sup>\*</sup>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.

Academic Writing (AW)	GENERAL EDUCATIO	N REQUIREMENTS		MAJOR REQUIREMENTS		
Professional Writing (PW)	Fundamental Studies			ENMA 180 - MSE: The Field and the Future	1	
Semantics   Sema	Academic Writing (AW)	ENGL 101	3	ENMA 300 - Intro to Materials Engineering	3	
Distributive Studies	Professional Writing (PW)	ENGL 393	3	ENMA 301 - Materials Emerging Tech	3	
History/Social Sciences (HS*)  Aistory/Social Sciences (HS*)  Aistory/Social Sciences (HS*)  Alistory/Social Sciences (HS*)  Alistory/Social Sciences (HS*)  Alistory/Social Sciences (HS*)  Alimanities (HU*)  Alimanities (HU*)  Bumanities (HU*)  Alimanities (	Oral Communication (OC)		3	ENMA 312 - Experimental Methods in MSE	3	
History/Social Sciences (HS*)  Jumanities (HU*)  Scholarship in Practice (SP*) out of major  Scholarship in Practice (SP*) out of major  Jeseries Courses  I-Series (IS*)  Diversity  Understanding Plural Societies (UP*)  WAJOR REQUIREMENTS  Basic Sciences  CHEM 135-Chem Engr OR 131 & 134 -Fund & Prin  JASAL  HEM 345-Chem Engr OR 131 & 134 -Fund & Prin  JASAL  SHMA 4XX - Spec. Elective**  ENMA 4XX - Spec. Elective**  ENMA 4XX - Spec. Elective**  SCI ELEC - Upper level Science Elective  Requirements for Graduation:  Requirements for Graduation:  Final 30 credits must be earned at UND  To other final 30 credits must be earned at UND  To other final 30 credits must be earned at UND  To other final 30 credits must be earned at UND  To other final 30 credits must be earned at UND  To other final 30 credits must be earned at UND  To other final 30 credits must be earned at UND  To other final 30 credits must be earned at UND  To other final 30 credits must be earned at UND  To other final 30 credits must be earned at UND  To other final 30 credits must be earned at UND  To other final 30 credits must be earned at UND  To other final 30 credits must be earned at UND  To other final 30 credits must be earned at UND  To other final 30 credits must be earned at UND  To other final 30 credits must be earned at UND  To other final 30 credits must be earned at UND  To other final 30 credits must be earned at UND  To other final 30 credits must be earned at UND  To other final 30 credits must be earned at UnD  To other final 30 credits must be earned at UND  To other final 30 credits must be earned at UND  To other final 30 credits must be earned at UND  To other final 30 credits must be ear	Distributive Studies			ENMA 362 - Mechanical Properties	3	
Humanities (HU*)    Sample   Semma   S	History/Social Sciences (HS*)		3	ENMA 441 - Characterization of Materials	3	
Humanities (HU*)  Scholarship in Practice (SP*) out of major  Jeseries Courses  I-Series (IS*)  Joya  Jeseries (IS*)  Joya  Joya Scholarstanding Plural Societies (UP*)  Understanding Plural Societies (UP*)  Understanding Plural Societies (UP*)  Understanding Plural Societies (UP*)  Understanding Plural Societies (UP*)  WAJOR REQUIREMENTS  Basic Sciences  WAJOR REQUIREMENTS  Basic Sciences  CHEM 135-Chem Engr OR 131 & 134 -Fund & Prin  Joya Scholarsty Lab for Eng  PHYS 161 - General Physics I (NS)  PHYS 260 and 261 - Gen Physics II & Lab (NL)  PHYS 270 and 271 - Gen Physics III & Lab  MATH 140 - Calculus I (MA/AR)  MATH 206 - Intro to MATLAB  MATH 140 - Calculus I (MA/AR)  MATH 241 - Calculus III  MATH 241 - Calculus III  MATH 244 - Calculus III  MATH 244 - Calculus III  MATH 245 - Differential Equations  ENES 100 - Intro to Eng Design (SP)  Sales Substituting Teaching and satisfactory completion of all degree requirements, more requirements for graduation and substituting a fer fall 2012 must have a 2.0 minimum GPA for all degree requirements, more requirements for undergraduate certificate requirements (Notice sand substituting a series and undergraduate certificate requirements (Notice sand substituting a series and undergraduate certificate requirements (Notice sand substituting a series and undergraduate certificate requirements (Notice sand substitutional electives and sciences, specified degree tracks, technical requirements for sciences, specified degree tracks, technical requirements for sciences, specified degree tracks, technical requirements for sciences and sciences, specified degree tracks, technical requirements for sciences, second and sciences, sec	History/Social Sciences (HS*)		3	ENMA 460 - Physics of Materials	3	
Scholarship in Practice (SP*) out of major   3	Humanities (HU*)		3	ENMA 461 - Thermodynamics		
I-Series Courses I-Series (IS*)	Humanities (HU*)		3	ENMA 465 - Micro-processing	3	
I-Series (IS*)	Scholarship in Practice (SP*) out of m	ajor	3	ENMA 470 - Materials Selection for Engr Design	3	
Technical Requirements   Series (IS*)   Diversity	I-Series Courses			ENMA 471 - Kinetics	3	
Understanding Plural Societies (UP*) Understanding Plural Societies (UP*) OR Cultural Competency (CC*)  MAJOR REQUIREMENTS  Basic Sciences  CHEM 135-Chem Engr OR 131 & 134-Fund & Prin CHEM 135-Chem Engr OR 131 & 134-Fund & Prin CHEM 136- Chemistry Lab for Eng CHEM 136- Chemistry Lab for Eng CHEM 137-Chem Engr OR 131 & 134-Fund & Prin CHEM 136- Chemistry Lab for Eng CHEM 136- Chemistry Lab for Eng CHEM 136- Chemistry Lab for Eng CHEM 137-Chem Engr OR 131 & 134-Fund & Prin CHEM 136- Chemistry Lab for Eng CHEM 231 & 232-Org Chem I or CHEM 481 TECH 4XX - Tech. Elective** ENMA 4XX - Spec. Elective** SCI ELEC - Upper level Science Elective 3 Tech 4XX - Tech. Elective** ENMA 4XX - Spec. Elective** ENMA 4XX - Spec. Elective** ENMA 4XX - Spec. Elective** SCI ELEC - Upper level Science Elective 3 Tech 4XX - Tech. Elective** ENMA 4XX - Spec. Elective** ENMA 4XX - Spec. Elective** ENMA 4XX - Spec. Elective** SCI ELEC - Upper level Science Elective 3 Tech 4XX - Tech. Elective** ENMA 4XX - Spec. Elective** ENMA 4XX - Spec. Elective** ENMA 4XX - Spec. Elective** SCI ELEC - Upper level Science Elective 3 Tech 4XX - Tech. Elective** ENMA 4XX - Spec. Elective** ENMA 4XX - Spec. Elective** ENMA 4XX - Spec. Elective** SCI ELEC - Upper level Science Elective 3 Tech 4XX - Spec. Elective** ENMA 4XX - Spec. Elective* SCI ELEC - Upper level Science Elective 3 Tech 4XX - Spec. Elective** ENMA 4XX - Spec. Elective** ENMA 4XX - Spec. Elective** ENMA 4XX - Spec. Elective* SCI ELEC - Upper level science Elective 3 Tech 4XX - Spec. Elective** ENMA 4XX - Spec. Elective* ENMA 4XX - Spe	I-Series (IS*)		0/3	ENMA 490 - Materials Design	3	
Understanding Plural Societies (UP*) OR Understanding Plural Societies (UP*) OR Cultural Competency (CC*)  MAJOR REQUIREMENTS Basic Sciences  CHEM 135-Chem Engr OR 131 & 134 -Fund & Prin CHEM 135-Chem Engr OR 131 & 134 -Fund & Prin CHEM 136 - Chemistry Lab for Eng CHEM 136 - Chemistry Lab for Eng CHEM 136 - General Physics I (NS) CHEM 136 - Chemistry Lab for Eng CHEM 137 - General Physics I (NS) CHEM 138 - Chemistry Lab for Eng CHEM 138 - Chemistry Lab for Eng CHEM 138 - Chemistry Lab for Eng CHEM 137 - Spec. Elective** CHEM 138 - Chemistry Lab for Eng CHEM 4XX - Spec. Elective** CHMA 4XX - Spec. Elective* CHMA 4XX - Spec.	I-Series (IS*)		0/3	Technical Requirements		
Understanding Plural Societies (UP*) OR Cultural Competency (CC*)  MAJOR REQUIREMENTS  Basic Sciences  CHEM 135-Chem Engr OR 131 & 134 -Fund & Prin CHEM 136 - Chemistry Lab for Eng CHYS 161 - General Physics I (NS) CHYS 270 and 261 - Gen Physics II & Lab CHYS 270 and 271 - Gen Physics II & Lab CHYS 270 and 271 - Gen Physics II & Lab CHYS 270 and 271 - Gen Physics II & Lab CHYS 270 and 271 - Gen Physics II & Lab CHYS 270 and 271 - Gen Physics II & Lab CHYS 270 and 271 - Gen Physics II & Lab CHYS 270 and 271 - Gen Physics II	Diversity			CHEM 231 & 232-Org Chem I or CHEM 481	3&1or3	
Cultural Competency (CC*)  MAJOR REQUIREMENTS  Basic Sciences  CHEM 135-Chem Engr OR 131 & 134 -Fund & Prin   3/381   CHEM 135-Chem Engr OR 131 & 134 -Fund & Prin   3/381   CHEM 136 - Chemistry Lab for Eng   1   PHYS 161 - General Physics I (NS)   3 or 4   PHYS 260 and 261 - Gen Physics II & Lab (NL)   3 & 1   PHYS 270 and 271 - Gen Physics III & Lab   3 & 1   PHYS 270 and 271 - Gen Physics III & Lab   3 & 1   MATH 140 - Calculus I (MA/AR)   4   MATH 206 - Intro to MATLAB   1   MATH 214 - Calculus II   4   MATH 241 - Calculus II   4   MATH 242 - Differential Equations   3   Engineering Sciences  ENES 100 - Intro to Eng Design (SP)   3   ENES 102 - Mechanics I   3    * May satisfy more than one requirement. See www.gened.umd.edu   5    ENMA 4XX - Spec. Elective**   3   ENMA 4XX - Spec. Elective**   5   ENMA 4XX	Understanding Plural Societies (UP*)		0/3	TECH 4XX - Tech. Elective**	3	
ENMA 4XX - Spec. Elective**   3   3   3   3   3   3   3   3   3	Understanding Plural Societies (UP*)	OR	0/2	TECH 4XX - Tech. Elective**	3	
Basic Sciences  CHEM 135-Chem Engr OR 131 & 134 - Fund & Prin 3/3&1 CHEM 136 - Chemistry Lab for Eng 1 PHYS 161 - General Physics I (NS) 3 or 4 PHYS 260 and 261 - Gen Physics II & Lab (NL) 3 & 1 PHYS 270 and 271 - Gen Physics III & Lab 3 & 1 MATH 140 - Calculus I (MA/AR) 4 MATH 206 - Intro to MATLAB 11 MATH 241 - Calculus II 11 MATH 241 - Calculus III 12 of the final 30 credits must be earned at UMD 15 of the final 30 credits must be upper level major coursework 17 requirements are required for graduation 18 requirements are required for graduation 19 sciences 20 - Mechanics I 3	Cultural Competency (CC*)		0/3	ENMA 4XX - Spec. Elective**	3	
CHEM 135-Chem Engr OR 131 & 134 - Fund & Prin  CHEM 136 - Chemistry Lab for Eng  PHYS 161 - General Physics I (NS)  PHYS 260 and 261 - Gen Physics II & Lab (NL)  PHYS 270 and 271 - Gen Physics III & Lab  MATH 140 - Calculus I (MA/AR)  MATH 206 - Intro to MATLAB  MATH 241 - Calculus III  MATH 241 - Calculus III  MATH 246 - Differential Equations  Engineering Sciences  ENES 100 - Intro to Eng Design (SP)  ENMA 4XX - Spec. Elective**  SCI ELEC - Upper level Science Elective  3  SCI ELEC - Upper level Science Elective  4  SCI ELEC - Upper level Science Elective  5  SCI ELEC - Upper level Sci	MAJOR REQU	IREMENTS		ENMA 4XX - Spec. Elective**	3	
CHEM 136 - Chemistry Lab for Eng  PHYS 161 - General Physics I (NS)  PHYS 260 and 261 - Gen Physics II & Lab (NL)  PHYS 270 and 271 - Gen Physics III & Lab  MATH 140 - Calculus I (MA/AR)  MATH 206 - Intro to MATLAB  MATH 411 - Calculus II  MATH 241 - Calculus III  MATH 242 - Calculus III  MATH 246 - Differential Equations  Engineering Sciences  ENES 100 - Intro to Eng Design (SP)  ENMA 4XX - Spec. Elective**  3 CCI ELEC - Upper level Science Elective  3 SCI ELEC - Upper level Science Elective  4 In the science Science All All All All All All All All All Al	Basic Sciences			ENMA 4XX - Spec. Elective**	3	
PHYS 161 - General Physics I (NS)  PHYS 260 and 261 - Gen Physics II & Lab (NL)  PHYS 270 and 271 - Gen Physics III & Lab  MATH 140 - Calculus I (MA/AR)  MATH 206 - Intro to MATLAB  MATH 411 - Calculus II  MATH 241 - Calculus III  MATH 246 - Differential Equations  Engineering Sciences  ENES 100 - Intro to Eng Design (SP)  ENES 102 - Mechanics I  * May satisfy more than one requirement. See www.gened.umd.edu  SCI ELEC - Upper level Science Elective  3 SCI ELEC - Upper level Science Elective  4 Physics III Science Science All Science A	CHEM 135-Chem Engr OR 131 & 134 -	Fund & Prin	3/3&1	ENMA 4XX - Spec. Elective**	3	
PHYS 260 and 261 - Gen Physics II & Lab (NL)  PHYS 270 and 271 - Gen Physics III & Lab  MATH 140 - Calculus I (MA/AR)  MATH 206 - Intro to MATLAB  MATH 141 - Calculus II  MATH 241 - Calculus III  MATH 244 - Calculus III  MATH 246 - Differential Equations  Engineering Sciences  ENES 100 - Intro to Eng Design (SP)  ENES 102 - Mechanics I  * May satisfy more than one requirement. See www.gened.umd.edu  PHYS 260 and 261 - Gen Physics II & Lab (NL)  3 & 1  Requirements for Graduation:    Final 30 credits must be earned at UMD   15 of the final 30 credits must be upper level major coursework   A minimum 2.00 cumulative UM GPA and satisfactory completion of all degree requirements are required for graduation   Students matriculating after Fall 2012 must have a 2.0 minimum GPA for all degree requirements, and undergraduate certificate requirements (Major courses are defined as: departmental courses basic sciences, engineering sciences, specified degree tracks, technical requirements/ technical electives and ENGL 393)	CHEM 136 - Chemistry Lab for Eng		1	ENMA 4XX - Spec. Elective**	3	
PHYS 270 and 271 - Gen Physics III & Lab  MATH 140 - Calculus I (MA/AR)  MATH 206 - Intro to MATLAB  MATH 141 - Calculus II  MATH 241 - Calculus II  MATH 246 - Differential Equations  Engineering Sciences  ENES 100 - Intro to Eng Design (SP)  ENES 102 - Mechanics I  * May satisfy more than one requirement. See www.gened.umd.edu  Requirements for Graduation:  Final 30 credits must be earned at UMD  Is of the final 30 credits must be earned at the 300-400 level  In 12 of the final 30 credits must be upper level major coursework  In A minimum 2.00 cumulative UM GPA and satisfactory completion of all degree requirements are required for graduation  Students matriculating after Fall 2012 must have a 2.0 minimum GPA for all degree requirements, minor requirements, and undergraduate certificate requirements (Major courses are defined as: departmental courses basic sciences, engineering sciences, specified degree tracks, technical requirements/ technical electives and ENGL 393)	PHYS 161 - General Physics I (NS)		3 or 4	SCI ELEC - Upper level Science Elective	3	
MATH 140 - Calculus I (MA/AR)  MATH 206 - Intro to MATLAB  MATH 141 - Calculus II  MATH 241 - Calculus III  MATH 246 - Differential Equations  Engineering Sciences  ENES 100 - Intro to Eng Design (SP)  ENES 102 - Mechanics I  * May satisfy more than one requirement. See www.gened.umd.edu  Final 30 credits must be earned at UMD  15 of the final 30 credits must be upper level major coursework  A minimum 2.00 cumulative UM GPA and satisfactory completion of all degree requirements are required for graduation  Students matriculating after Fall 2012 must have a 2.0 minimum GPA for all degree requirements, minor requirements, and undergraduate certificate requirements (Major courses are defined as: departmental courses basic sciences, engineering sciences, specified degree tracks, technical requirements/ technical electives and ENGL 393)	PHYS 260 and 261 - Gen Physics II & L	ab (NL)	3 & 1			
MATH 206 - Intro to MATLAB  MATH 141 - Calculus II  MATH 241 - Calculus III  MATH 246 - Differential Equations  Engineering Sciences  ENES 100 - Intro to Eng Design (SP)  ENES 102 - Mechanics I  * May satisfy more than one requirement. See www.gened.umd.edu  1 15 of the final 30 credits must be earned at the 300-400 level  12 of the final 30 credits must be upper level major coursework  A minimum 2.00 cumulative UM GPA and satisfactory completion of all degree requirements are required for graduation  Students matriculating after Fall 2012 must have a 2.0 minimum GPA for all degree requirements, minor requirements, and undergraduate certificate requirements (Major courses are defined as: departmental courses basic sciences, engineering sciences, specified degree tracks, technical requirements/ technical electives and ENGL 393)	PHYS 270 and 271 - Gen Physics III &	_ab	3 & 1	Requirements for Graduation:		
MATH 141 - Calculus II  MATH 241 - Calculus III  MATH 246 - Differential Equations  Engineering Sciences  ENES 100 - Intro to Eng Design (SP)  Students matriculating after Fall 2012 must have a 2.0 minimum GPA for all degree requirements, minor requirements, and undergraduate certificate requirements (Major courses are defined as: departmental courses basic sciences, engineering sciences, specified degree tracks, technical requirements/ technical electives and ENGL 393)	MATH 140 - Calculus I (MA/AR)		4	Final 30 credits must be earned at UMD		
MATH 241 - Calculus III  MATH 246 - Differential Equations  Engineering Sciences  ENES 100 - Intro to Eng Design (SP)  SNES 102 - Mechanics I  * May satisfy more than one requirement. See www.gened.umd.edu  A minimum 2.00 cumulative UM GPA and satisfactory completion of all degree requirements are required for graduation  Students matriculating after Fall 2012 must have a 2.0 minimum GPA for all degree requirements, minor requirements, and undergraduate certificate requirements (Major courses are defined as: departmental courses basic sciences, engineering sciences, specified degree tracks, technical requirements/ technical electives and ENGL 393)	MATH 206 - Intro to MATLAB		1	1 15 of the final 30 credits must be earned at the 300-400 level		
MATH 246 - Differential Equations  Engineering Sciences  ENES 100 - Intro to Eng Design (SP)  ENES 102 - Mechanics I  * May satisfy more than one requirement. See www.gened.umd.edu  Tequirements are required for graduation  Students matriculating after Fall 2012 must have a 2.0 minimum GPA for all degree requirements, minor requirements, and undergraduate certificate requirements (Major courses are defined as: departmental courses basic sciences, engineering sciences, specified degree tracks, technical requirements/ technical electives and ENGL 393)	MATH 141 - Calculus II		4	4 12 of the final 30 credits must be upper level major coursework		
Engineering Sciences  ENES 100 - Intro to Eng Design (SP)  ENES 102 - Mechanics I  * May satisfy more than one requirement. See www.gened.umd.edu  Students matriculating after Fall 2012 must have a 2.0 minimum GPA for all degree requirements, minor requirements, and undergraduate certificate requirements (Major courses are defined as: departmental courses basic sciences, engineering sciences, specified degree tracks, technical requirements/ technical electives and ENGL 393)	MATH 241 - Calculus III		4	4 A minimum 2.00 cumulative UM GPA and satisfactory completion of all degree		
ENES 100 - Intro to Eng Design (SP)  BNES 102 - Mechanics I  * May satisfy more than one requirement. See www.gened.umd.edu  degree requirements, minor requirements, and undergraduate certificate requirements  (Major courses are defined as: departmental courses basic sciences, engineering sciences, specified degree tracks, technical requirements/ technical electives and ENGL 393)	MATH 246 - Differential Equations		3	requirements are required for graduation		
* May satisfy more than one requirement. See www.gened.umd.edu  (Major courses are defined as: departmental courses basic sciences, engineering sciences, specified degree tracks, technical requirements/ technical electives and ENGL 393)	Engineering Sciences			Students matriculating after Fall 2012 must have a 2.0 minimum GPA for	or all	
* May satisfy more than one requirement. See www.gened.umd.edu   * More than one requirement. See www.gened.umd.edu   * More than one requirement. See www.gened.umd.edu   * More than one requirement. See www.gened.umd.edu	ENES 100 - Intro to Eng Design (SP)		3	degree requirements, minor requirements, and undergraduate certificate rec	quirements	
* May satisfy more than one requirement. See www.gened.umd.edu	ENES 102 - Mechanics I		3	(Major courses are defined as: departmental courses basic sciences, enginee	ring	
				sciences, specified degree tracks, technical requirements/ technical electives	and	
**Students should design a course program under the guidance of their advisor.  A minimum of 120 credits is required to earn the degree	$\ensuremath{^{*}}$ May satisfy more than one requirement. See	www.gened.umd.edu		ENGL 393)		
	**Students should design a course program un	der the guidance of their a	dvisor.	A minimum of 120 credits is required to earn the degree		

**MATERIALS SCIENCE AND ENGINEERING** 

NAME: \_\_\_\_\_

Degree: B.S. ENMA

Date:\_

For Degree Clearance Only

Advisor: \_\_\_\_\_

GPA/Credits: \_\_\_