

Nanosystems Engineering
Louisiana Tech University
Curriculum as of 2016 to Current

Name _____

Date _____

CWID _____

Email _____@latech.edu

COURSE	PREREQUISITE	SCH	QTR	GRADE					
NSE 202	CHEM 102, PHYS 201	3	W	R*					
300	ENGR 122 or PHYS 104, MATH 243	3	Sp	R					
302	CHEM 251, CHEM 253, NSE 201 or NSE 202	2	Sp	R*					
406	NSE 302, ENGR 220, 221, 222, MATH 245	1	F	R*					
407	NSE 406	1	W	R*					
408	NSE 407	1	Sp	R*					
410	MSE 404	3	F	R					
490	CHEM 251	3	Sp	R*					
CHEM 101	CHEM 100 (or by placement)	2		*					
102	CHEM 101	2		*					
103	CHEM 101○	1		*					
104	CHEM 103	1		*					
250	CHEM 102	2		*					
251	CHEM 250, 253○	2		*					
253	CHEM 102, 251○	1		*					
COMM 101	FYE 100○	3		□					
ELEN 334	MATH 244, ENGR 221, PHYS 202	3	F	R*					
ENGL 101		3							
102	ENGL 101	3							
303	ENGL 102	3							
ENGR 120	MATH 240○, CHEM 100○	2		*					
121	ENGR 120, MATH 241○, CHEM 101○	2		*					
122	ENGR 121, MATH 242○	2		*					
220	ENGR 122, MATH 242, PHYS 201	3		R					
221	ENGR 122, MATH 242, PHYS 201	3		R*					
222	ENGR 122, MATH 242	3		R*					
MATH 241	MATH 240 or placement by exam	3		*					
242	MATH 241	3		*					
243	MATH 242	3		*					
244	MATH 243	3		*					
245	MATH 244	3		*					
MEEN 382	ENGR 221, MATH 241-244 GPA ≥ 2.0	2	F,W	R					
MEMT 201	ENGR 122	2		R*					
MSE 402	ELEN 334	3	W	R					
404	MEMT 201, ELEN 334	3	W	R*					
406	PHYS 202	3	Sp	R*					
PHYS 201	MATH 241	3		*					
202	PHYS 201, MATH 242	3		*					
412	PHYS 202, MATH 244	3	F	R					
ELECTIVES/ GER									
Fine Art (ART 290, KINE 280, MUGN 290, or THTR 290)		3							
BISC 130 or 225		3							
Directed Elective		3		R					
Directed Elective		3		R					
Directed Elective		3		R					
Directed Elective		3		R					
Directed Elective		3		R					
Directed Elective		3		R					
HIST		3							
Social Science		3							
Social Science		3							
TOTAL SEMESTER HOURS		128							

SUBSTITUTIONS		
COURSE	SCH	GRADE
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

ADDITIONAL COURSES		
COURSE	SCH	GRADE
1		
2		
3		
4		
5		

GPA	
Rubric GPA	_____
MATH 241-244 GPA	_____

NOTES	
* requires grade of "C" or higher	
○ credit or registration in	
R course in rubric	
□ must be completed within first year of enrollment	
1 Directed electives must be selected in consultation with advisor.	
2 Petitions must be filed for substitutions.	
3 A student must have a minimum 2.0 GPA on all hours pursued in courses designated "R"	
4 BIEN concentration take BISC 225 and 226. All other students take BISC 130.	
5 NSE 300 can be substituted with MATH 313.	

ADDITIONAL COMMENTS	

Advisor: _____

NANOSYSTEMS ENGINEERING CONCENTRATIONS
Louisiana Tech University

BIOMEDICAL ENGINEERING CONCENTRATION									
COURSE			SCH	GRADE			PREREQUISITE		
BIEN	202 or	Biomedical Engineering Principles I	1	R				MATH 241	
	203	Biomedical Engineering Principles II		R				MATH 241	
	225	Biomedical Signals and Systems	3	R				ENGR 221, MATH 244, BIEN 203	
	235	Applied Biomaterials	3	R				MEMT 201	
	301	Biomedical Fluid Mechanics & Energy Transfer	3	R				BIEN 202, ENGR 222, and 2.0 GPA in MATH 241-245	
	401 or	Biomedical Mass Transport	3	R				BIEN 301, MATH 245	
	430	Biomechanics		R				BIEN 235, 301, ENGR 220	
Engr, Sci, or ENGL 363			3	R					
300-level or higher			2	R					
TOTAL			18						

CHEMICAL ENGINEERING CONCENTRATION									
COURSE			SCH	GRADE			PREREQUISITE		
CMEN	202	Chemical Engineering Calculations	3	R				MATH 241, ENGR 122o	
	304	Transport Phenomena	3	R				CMEN 313, MATH 245, 2.0 GPA in MATH 241-245	
	313	Unit Operations-Design II	3	R				CMEN 202, 213, ENGR 222, MATH 245	
	402	Chemical Reactions Engineering	3	R				CMEN 202 and Senior Standing	
Engr, Sci, or ENGL 363			3	R					
300-level or higher			3	R					
TOTAL			18						

ELECTRICAL ENGINEERING CONCENTRATION									
COURSE			SCH	GRADE			PREREQUISITE		
ELEN	223	Electrical Circuits II	3	R				ENGR 221	
	224	Electrical Circuits III	3	R				ELEN 223, MATH 245o	
	335	Electronic Circuits I	3	R				ELEN 224, 334	
	336	Electronic Circuits II	3	R				ELEN 335	
Engr, Sci, or ENGL 363			3	R					
300-level or higher			3	R					
TOTAL			18						

MECHANICAL ENGINEERING CONCENTRATION									
COURSE			SCH	GRADE			PREREQUISITE		
MEEN	350	Computer-Aided Modeling	1	R				ENGR 220, 2.0 GPA in MATH 241-244, cumulative GPA 2.7	
	353 or	Heat Transfer	3	R				MATH 245, MEEN 350, ENGR 222, MATH 313o	
MEMT	361	Advanced Mechanics of Materials		R				MEEN 350, MEMT 211 or 212	
	203	Dynamics	3	R				ENGR 220	
	212	Intermediate Statics & Mechanics of Materials	3	R				ENGR 220, 2.0 GPA in MATH 241-243	
	313	Elementary Fluid Mechanics	3	R				ENGR 222, MEMT 203, 2.0 GPA in MATH 241-244	
Engr, Sci, or ENGL 363			2	R					
300-level or higher			3	R					
TOTAL			18						

MICROSYSTEMS ENGINEERING CONCENTRATION									
COURSE			SCH	GRADE			PREREQUISITE		
MSE	401	Fundamentals of Microfabrication Processes	3	R				PHYS 202, MATH 245	
	405	Nanotechnology Principles	3	R					
	407	Advanced Microfabrication w/CAD	3	R				MSE 401	
	457	Special Topics: Micro System Engineering	3	R					
Engr, Sci, or ENGL 363			3	R					
300-level or higher			3	R					
TOTAL			18						

* requires grade of "C" or higher

o indicates co-requisite

R-Course is in NSE Rubric

Reviewed Aug. 2022

NANOSYSTEMS ENGINEERING
Louisiana Tech University
Biomedical Engineering Concentration

FRESHMAN YEAR											
Fall Quarter			Hr	Winter Quarter			Hr	Spring Quarter			Hr
ENGR	120	* Engr Problem Solving I	2	ENGR	121	* Engr Problem Solving II	2	ENGR	122	* Engr Problem Solving III	2
MATH	240	* Math for Engr & Science	3	MATH	241	* Calculus I	3	MATH	242	* Calculus II	3
CHEM	100	* General Chemistry	2	CHEM	101	* General Chemistry	2	CHEM	102	* General Chemistry	2
COMM	101	□ Principles of Comm Studies	3	CHEM	103	* General Chemistry Lab	1	CHEM	104	* General Chemistry Lab	1
FYE	100	Freshman Year Experience	1	ENGL	101	Freshmen Composition	3	PHYS	201	* Physics for Engr & Sci. I	3
								BIEN	203	Biomedical Engr Principles II	1
								or BIEN 202 (offered in Fall)			
			11				11				12

SOPHOMORE YEAR											
Fall Quarter			Hr	Winter Quarter			Hr	Spring Quarter			Hr
ENGR	222	* Thermodynamics	3	ENGR	220	* Statics and Mechs of Materials	3	ENGR	221	* Electrical Engr & Circuits I	3
MATH	243	* Calculus III	3	MATH	244	* Calculus IV	3	MATH	245	* Differential Equations	3
MEMT	201	* Engineering Materials	2	NSE	202	* Intro. to Nanosystems Engr	3	NSE	300	o Intro. to Programming for Engr &	3
PHYS	202	* Physics for Engr & Sci II	3	BIEN	235	Applied Biomaterials	3	ENGL	102	Freshmen Composition II	3
BIEN	202	Biomedical Engr Principles I	1								
or BIEN 203 (offered in Spring)											
			12				12				12

JUNIOR YEAR											
Fall Quarter			Hr	Winter Quarter			Hr	Spring Quarter			Hr
BIEN	225	Biomedical Signals & Systems	3	BIEN	301	Fluid Mech. & Energy Transfer	3	NSE	302	* Nanomanufacturing	2
ELEN	334	* Solid State Electronics	3	MSE	402	MEMS/NEMS	3	NSE	490	* Nanosystems Modeling	3
CHEM	250	* Organic Chemistry	2	MSE	404	* Micro/Nanomaterials	3	MSE	406	* Micro/Nano Measurements	3
BISC	225	Human Anatomy & Physiology	3	CHEM	251	* Organic Chemistry	2	BIEN 401	Biomed. Mass Transport	3	
				CHEM	253	* Organic Chemistry Lab	1	or BIEN 430 Biomechanics in Fall			
			11				12				11

SENIOR YEAR											
Fall Quarter			Hr	Winter Quarter			Hr	Spring Quarter			Hr
NSE	406	* Senior Design I	1	NSE	407	* Senior Design II	1	NSE	408	Senior Design III	1
NSE	410	Nanosystems & Devices	3	Directed Elective◇			3	Fine Art Appreciation			3
MEEN	382	Basic Measurements	2	Social Science**			3	History Elective			3
PHYS	412	Solid State Physics	3	Social Science**			3	Directed Elective◇			2
ENGL	303	Technical Writing	3								
			12				10				9

Neither MATH 240 nor CHEM 100 count towards the nanosystems engineering degree.

* Requires grade of "C" or higher.

◇Directed electives are chosen in consultation with advisor and approved by the Program Chair. Eng. or Sci. 300 or 400 level courses or ENGL 363.

Courses in **bold** are *typically* offered only once per year.

**Social Science electives can be selected from Anthropology, Criminal Justice, Economics, Geography, International Studies, Interdisciplinary,

Political Science, Psychology, and Sociology.

†Humanities electives can be selected from Classical Studies, Communications, Foreign Languages, History, Literature, Philosophy,

Religious Studies, Interdisciplinary.

□ Must be completed within first year of enrollment.

o NSE 300 can be substituted with Math 313.

NANOSYSTEMS ENGINEERING
Louisiana Tech University
Chemical Engineering Concentration

FRESHMAN YEAR					
Fall Quarter		Hr	Winter Quarter		Hr
ENGR 120	* Engr Problem Solving I	2	ENGR 121	* Engr Problem Solving II	2
MATH 240	* Math for Engr & Science	3	MATH 241	* Calculus I	3
CHEM 100	* General Chemistry	2	CHEM 101	* General Chemistry	2
COMM 101	□ Principles of Comm Studies	3	CHEM 103	* General Chemistry Lab	1
FYE 100	Freshman Year Experience	1	ENGL 101	Freshman Composition	3
		11			11

SOPHOMORE YEAR					
Fall Quarter		Hr	Winter Quarter		Hr
ENGR 220	Statics and Mechs of Materials	3	ENGR 221	* Electrical Engr & Circuits I	3
MATH 243	* Calculus III	3	MATH 244	* Calculus IV	3
PHYS 202	* Physics for Engr & Sci II	3	NSE 202	* Intro. to Nanosystems Engr	3
CMEN 202	* Chemical Engr Calculations	3	MENT 201	* Engineering Materials	2
			ENGL 102	Freshman Composition II	3
		12			11

JUNIOR YEAR					
Fall Quarter		Hr	Winter Quarter		Hr
CHEM 250	* Organic Chemistry	2	CHEM 251	* Organic Chemistry	2
History Elective		3	CHEM 253	* Organic Chemistry Lab	1
ELEN 334	* Solid State Electronics	3	CMEN 313	Unit Operations-Design II	3
BISC 130	Biological Principles	3	MSE 402	MEMS/NEMS	3
			MSE 404	* Micro/Nanomaterials	3
		11			12

SENIOR YEAR					
Fall Quarter		Hr	Winter Quarter		Hr
NSE 406	* Senior Design I	1	NSE 407	* Senior Design II	1
NSE 410	Nanosystems & Devices	3	Social Science**		3
CMEN 402	Chemical Reaction Engineering	3	Directed Elective◊		3
MEEN 382	Basic Measurements	2	ENGL 303	Technical Writing	3
PHYS 412	Solid State Physics	3			
		12			10

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NANOSYSTEMS ENGINEERING
Louisiana Tech University
Electrical Engineering Concentration

FRESHMAN YEAR											
Fall Quarter			Hr	Winter Quarter			Hr	Spring Quarter			Hr
ENGR	120	* Engr Problem Solving I	2	ENGR	121	* Engr Problem Solving II	2	ENGR	122	* Engr Problem Solving III	2
MATH	240	* Math for Engr & Science	3	MATH	241	* Calculus I	3	MATH	242	* Calculus II	3
CHEM	100	* General Chemistry	2	CHEM	101	* General Chemistry	2	CHEM	102	* General Chemistry	2
COMM	101	Principles of Comm Studies	3	CHEM	103	* General Chemistry Lab	1	CHEM	104	* General Chemistry Lab	1
FYE	100	Freshman Year Experience	1	ENGL	101	Freshman Composition	3	PHYS	201	* Physics for Engr & Sci I	3
			11				11				11

SOPHOMORE YEAR											
Fall Quarter			Hr	Winter Quarter			Hr	Spring Quarter			Hr
ENGR	220	Statics and Mechs of Materials	3	ENGR	221	* Electrical Engr & Circuits I	3	ENGR	222	* Thermodynamics	3
MATH	243	* Calculus III	3	MATH	244	* Calculus IV	3	ELEN	223	Electrical Circuits II	3
MEMT	201	* Engineering Materials	2	NSE	202	* Intro. to Nanosystems Engr.	3	MATH	245	* Differential Equations	3
PHYS	202	* Physics for Engr & Sci II	3	ENGL	102	Freshman Composition II	3	NSE	300	o Intro. to Programming for Engr &	3
			11				12				12

JUNIOR YEAR											
Fall Quarter			Hr	Winter Quarter			Hr	Spring Quarter			Hr
CHEM	250	* Organic Chemistry	2	CHEM	251	* Organic Chemistry	2	ELEN	336	Electronic Circuits II	3
ELEN	224	Electrical Circuits III	3	CHEM	253	* Organic Chemistry Lab	1	MSE	406	* Micro/Nano Measurements	3
ELEN	334	* Solid State Electronics	3	ELEN	335	Electronic Circuits I	3	NSE	302	* Nanomanufacturing	2
BISC	130	Biological Principles	3	MSE	402	* MEMS AND NEMS	3	NSE	490	* Nanosystems Modeling	3
				MSE	404	* Micro/Nanomaterials	3				
			11				12				11

SENIOR YEAR											
Fall Quarter			Hr	Winter Quarter			Hr	Spring Quarter			Hr
NSE	406	* Senior Design I	1	NSE	407	* Senior Design II	1	NSE	408	Senior Design III	1
NSE	410	Nanosystems & Devices	3	Social Science**			3	Fine Art Appreciation			3
MEEN	382	Basic Measurements	2	History Elective			3	Social Science**			3
PHYS	412	Solid State Physics	3	Directed Elective ◊			3	Directed Elective ◊			3
ENGL	303	Technical Writing	3								
			12				10				10

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Political Science, Psychology, and Sociology.

+Humanities electives can be selected from Classical Studies, Communications, Foreign Languages, History, Literature, Philosophy, †

Religious Studies, Interdisciplinary.

o NSE 300 can be substituted with MATH 313.

Reviewed Aug. 2022

NANOSYSTEMS ENGINEERING
Louisiana Tech University
Mechanical Engineering Concentration

FRESHMAN YEAR														
Fall Quarter				Hr	Winter Quarter				Hr	Spring Quarter				Hr
ENGR	120	*	Engr Problem Solving I	2	ENGR	121	*	Engr Problem Solving II	2	ENGR	122	*	Engr Problem Solving III	2
MATH	240	*	Math for Engr & Science	3	MATH	241	*	Calculus I	3	MATH	242	*	Calculus II	3
CHEM	100	*	General Chemistry	2	CHEM	101	*	General Chemistry	2	CHEM	102	*	General Chemistry	2
COMM	101		Principles of Comm Studies	3	CHEM	103	*	General Chemistry Lab	1	CHEM	104	*	General Chemistry Lab	1
FYE	100		Freshman Year Experience	1	ENGL	101		Freshman Composition	3	PHYS	201	*	Physics for Engr & Sci I	3
				11					11					11

SOPHOMORE YEAR											
Fall Quarter			Hr	Winter Quarter			Hr	Spring Quarter			Hr
ENGR	220	* Statics and Mechs of Materials	3	ENGR	221	* Electrical Engr & Circuits I	3	ENGR	222	* Thermodynamics	3
MATH	243	* Calculus III	3	MATH	244	* Calculus IV	3	MATH	245	* Differential Equations	3
MEMT	201	* Engineering Materials	2	NSE	202	* Intro. to Nanosystems Engr	3	NSE	300	o Intro. to Progr. for Engr & Sci	3
PHYS	202	* Physics for Engr & Sci II	3	ENGL	102	Freshman Composition II	3	History Elective			3
			11				12				12

JUNIOR YEAR											
Fall Quarter			Hr	Winter Quarter			Hr	Spring Quarter			Hr
CHEM	250	* Organic Chemistry	2	CHEM	251	* Organic Chemistry	2	MSE	406	* Micro/Nano Measurements	3
MEEN	350	Computer Aided Modeling	1	CHEM	253	* Organic Chemistry Lab	1	NSE	302	* Nanomanufacturing	2
ELEN	334	* Solid State Electronics	3	MEMT	212	Intermediate Statics & Mech of Mat.	3	NSE	490	* Nanosystems Modeling	3
MEMT	203	Dynamics	3	MSE	402	MEMS and NEMS	3	MEEN	353	Heat Transfer or	3
BISC	130	Biological Principles	3	MSE	404	* Micro/Nanomaterials	3	or MEEN 361 Advanced Mechanics of Materials			
			12				12				11

SENIOR YEAR											
Fall Quarter			Hr	Winter Quarter			Hr	Spring Quarter			Hr
NSE	406	* Senior Design I	1	NSE	407	* Senior Design II	1	NSE	408	* Senior Design III	1
NSE	410	Nanosystems & Devices	3	ENGL	303	Technical Writing	3	Fine Art Appreciation			3
MEMT	313	Dynamics	3	Social Science**			3	Social Science**			3
MEEN	382	Basic Measurements	2	Directed Elective◊			2	Directed Elective◊			3
PHYS	412	Solid State Physics	3								
			12				9				10

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NANOSYSTEMS ENGINEERING
Louisiana Tech University
Microsystems Engineering Concentration

FRESHMAN YEAR											
Fall Quarter			Hr	Winter Quarter			Hr	Spring Quarter			Hr
ENGR	120	* Engr Problem Solving I	2	ENGR	121	* Engr Problem Solving II	2	ENGR	122	* Engr Problem Solving III	2
MATH	240	* Math for Engr & Science	3	MATH	241	* Calculus I	3	MATH	242	* Calculus II	3
CHEM	100	* General Chemistry	2	CHEM	101	* General Chemistry	2	CHEM	102	* General Chemistry	2
COMM	101	Principles of Comm Studies	3	CHEM	103	* General Chemistry Lab	1	CHEM	104	* General Chemistry Lab	1
FYE	100	Freshman Year Experience	1	ENGL	101	Freshman Composition	3	PHYS	201	* Physics for Engr & Sci I	3
			11				11				11

SOPHOMORE YEAR											
Fall Quarter			Hr	Winter Quarter			Hr	Spring Quarter			Hr
ENGR	220	Statics and Mechs of Materials	3	ENGR	221 *	Electrical Engr & Circuits I	3	ENGR	222 *	Thermodynamics	3
MATH	243 *	Calculus III	3	MATH	244 *	Calculus IV	3	MATH	245 *	Differential Equations	3
MEMT	201 *	Engineering Materials	2	NSE	202 *	Intro. to Nanosystems Engr	3	NSE	300 o	Intro. to Programming for Engr &	3
PHYS	202 *	Physics for Engr & Sci II	3	ENGL	102	Freshman Composition II	3	History Elective			3
			11				12				12

JUNIOR YEAR											
Fall Quarter			Hr	Winter Quarter			Hr	Spring Quarter			Hr
CHEM	250	* Organic Chemistry	2	CHEM	251	* Organic Chemistry	2	MSE	405	Nanotechnology Principles	3
MSE	401	* Fund. Microfabrication Processes	3	CHEM	253	* Organic Chemistry Lab	1	MSE	406	* Micro/Nano Measurements	3
ELEN	334	* Solid State Electronics	3	MSE	402	MEMS and NEMS	3	NSE	302	* Nanomanufacturing	2
BISC	130	Biological Principles	3	MSE	404	* Micro/Nanomaterials	3	NSE	490	* Nanosystems Modeling	3
		</									

SENIOR YEAR											
Fall Quarter			Hr	Winter Quarter			Hr	Spring Quarter			Hr
NSE	406 *	Senior Design I	1	NSE	407 *	Senior Design II	1	NSE	408	Senior Design III	1
NSE	410	Nanosystems & Devices	3	MSE	407	Advanced Microfab. w/CAD	3	MSE	457	Spec. Topics: Micro Sys. Engr.	3
ENGL	303	Technical Writing	3	Social Science**			3	Fine Art Appreciation			3
MEEN	382	Basic Measurements	2	Directed Elective◊			3	Social Science**			3
PHYS	412	Solid State Physics	3								
			12				10				10

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