

ELECTRICAL ENGINEERING & PHYSICS DOUBLE MAJOR

Curriculum Guide effective Fall 2017 ~ North Dakota State University

STUDENT _____

ID # _____

ADVISOR _____

	Fall				Spring			
	Course	Crs	Grade	Gen Ed	Course	Crs	Grade	Gen Ed
Freshman	PHYS 171	Intro Physics Projects	1		ECE 111	Intro to ECE	3	
		Wellness Elec	2		ENGL 120	College Composition II	3	C
	COMM 110	Fund Public Speaking	3		MATH 129	Basic Linear Algebra	3	
	ECE 173	Intro to Computing	4		MATH 166	Calculus II	4	
	ENGL 110	College Composition I	3		PHYS 251	Univ Physics I	4	S
	MATH 165	Calculus I	4		PHYS 251L	Univ Physics I Lab	1	S & L
				PHYS 251R	Physics I Recitation	1		
		17				19		
Sophomore	EE 206	Circuit Analysis I/lab	4		PHYS 370	Computational Physics	3	
	MATH 265	Calculus III (w/vectors)	4		ECE 311	Circuit Analysis II/lab	4	
	ECE 275	Digital Design/lab	4		MATH 266	Intro Differential Equations	3	
	PHYS 252	Univ Physics II	4	S	PHYS 350	Modern Physics	3	
	PHYS 252L	Univ Physics II Lab	1	S	Gen Ed Elective [‡]		3	A or B
	PHYS 252R	Physics II Recitation	1					
		18				16		
Junior	ECE 320	Electronics I/lab	3		ECE 401	Design I (capstone)	1	
	ECE 321	Electronics II/lab	2		ECE 331	Energy Conversion/lab	4	
	PHYS 355	Classical Mechanics	3		ECE 376	Embedded Systems/lab	4	
	PHYS 360	Modern Physics II	3		ECE 351	Applied EM/lab	4	
	PHYS 462	Thermal/Statistical Phys	3		ECE 343	Signals & Systems	4	
	ENGL	Upper Level Writing*	3	C				
		17				17		
Senior	ECE 403	Design II (capstone)	2		ECE 405	Design III (capstone)	3	
	ENGR 402	Engr Ethics/Social Resp	1		ECE Elective		3	
	PHYS 485	Quantum Mechanics I	3		ECE Elective		3	
	ECE 341	Random Processes	3		Gen Ed Elective		3	A or B
	PHYS Elective		2		Gen Ed Elective [‡]		3	A or B
	ECE/PHYS Elec		3					
Gen Ed Elective [‡]		3	A or B					
		17				15		
TOTAL CREDITS						136		

General Education Electives			
<i>Approved courses listed in the registration schedule centerfold.</i>			
Gen Ed	Course	Crs	Grade
A		3	
A		3	
B		3	
B		3	
D ■	(double-count with A or B above)		
G ●	(double-count with A or B above)		
L		1	
W		2	

General Education Categories:

- A - Humanities/Fine Arts
- B - Social/Behavioral Sciences
- C - Communication
- D - Cultural Diversity ■
- F - First-Year Experience
- G - Global Perspectives ●
- L - Co-requisite Lab
- R - Quantitative Reasoning
- S - Science & Technology
- W - Wellness

[‡]Suggested to take either ECON 105, ECON 201, or ECON 202

*Select from ENGL 320, 321, 324 or 459 to satisfy the Upper Level Writing for General Education

[‡]Suggested to take ENGR 312 and ENGR 311

Students must earn a "C" or better in ECE 173, ECE 275, EE 206, and all required MATH courses, before enrolling in ECE courses listed above in the Junior or Senior years

[‡]Students must take ECE 111 prior to enrolling in ECE courses listed above in the Junior or Senior year; otherwise, students must take an additional ECE Elective in lieu of ECE 111

ECE Elective: any didactic ECE 4xx course² (not 493, 494, 496)

ECE/PHYS Elective: cross-listed ECE/PHYS 4xx course²

PHYS Elective: PHYS 481, 486, 489, PHYS 215 (at least 2 credits), or MSUM AST 3xx/4xx course (with permission from Physics department)

¹ Students must have at least a 2.0 GPA in all required EE, ECE, and PHYS courses taken at NDSU, in order to graduate. Elective ECE or PHYS courses are not included in this GPA requirement.

² See <http://bulletin.ndsu.edu/course-catalog/descriptions/ece/> for the full list of ECE and ECE/PHYS courses

Electrical Engineering TECH ELECTIVES

Curriculum updated 4/2015

ECE 374	Computer Organization	4
ECE 4xx	Any Didactic 4xx ECE Course ³	3-4
ECE 494	Independent Study (max 6 hours)	3
ECE 496	Field Experience (max 3 hours)	3
ABEN 456	Biobased Energy	3
BIOL 150/150L	General Biology I and Lab*	4
BIOL 220/220L	Human Anatomy and Physiology I and Lab*	4
BIOL 221/221L	Human Anatomy and Physiology II and Lab*	4
BIOL 315/315L	Genetics and Lab*	4
CE 309/310	Fluid Mechanics and Lab*	4
CE/ME 486	Nanotechnology and Nanomaterials	3
CHEM 122/122L	General Chemistry II and Lab*	4
CHEM 341/341L	Organic Chemistry I and Lab*	4
CHEM 342/342L	Organic Chemistry II and Lab*	4
CHEM 364	Physical Chemistry I	3
CHEM 365/471	Physical Chemistry II and Lab*	5
CHEM 425/429	Inorganic Chemistry I and Lab*	5
CSCI 161	Computer Science II	4
CSCI 222	Discrete Mathematics	3
CSCI 336	Theoretical Computer Science II	3
CSCI 366	Files for D-Base Systems	3
CSCI 372	Comparative Languages	3
CSCI 426	Introduction to Artificial Intelligence	3
CSCI 458	Microcomputer Graphics	3
CSCI 459	Foundations of Computer Networks	3
CSCI 467	Algorithm Analysis	3
CSCI 474	Operating Systems Concepts	3
CSCI 475	Operating Systems Design	3
CSCI 477	Object-Oriented Systems	3
ENGR 310	Entrepreneurship for Engineers and Scientists	3

IME 440	Engineering Economy	3
IME 456	Program & Project Management	3
IME 461	Quality Assurance & Control	3-4
MATH 270	Introduction to Abstract Math	3
MATH 420	Abstract Algebra I	3
MATH 421	Abstract Algebra II	3
MATH 429	Linear Algebra	3
MATH 450	Real Analysis I	3
MATH 451	Real Analysis II	3
MATH 452	Complex Analysis	3
MATH 480	Applied Differential Equations	3
MATH 481	Fourier Analysis	3
MATH 483	Partial Differential Equations	3
MATH 488	Numerical Analysis I	3
MATH 489	Numerical Analysis II	3
ME 221	Engineering Mechanics I	3
ME 222	Engineering Mechanics II	3
ME 223	Mechanics of Materials	3
ME 350	Thermodynamics & Heat Transfer	3
ME 470	Renewable Energy Technology	3
MICR 445	Animal Cell Culture Techniques	2
PHYS 350	Modern Physics	3
PHYS 360	Modern Physics II	3
PHYS 413	Lasers for Scientists and Engineers	3
PHYS 415	Elements of Photonics	3
PHYS 485	Quantum Mechanics I	3
STAT 450	Stochastic Processes	3
STAT 451	Bayesian Stat Decision Theory	3
STAT 468	Probability & Math Stats II	3
ZOO 460	Animal Physiology	3

¹ In order for the BIOL, CHEM, and CE lecture/lab courses listed above (denoted with a *) to count as an EE Tech Elective, students must take and pass both the lecture and corresponding lab, which are listed together above

² The EE Curriculum requires a minimum of 12 credits of Tech Electives; this may be satisfied by either 3 or 4 of the above courses (i.e., four 3-credit courses or three 4-credit courses)

³ See <http://bulletin.ndsu.edu/course-catalog/descriptions/ece/> for the full list of ECE courses

Electrical Engineering & Physics Double Major Curriculum Flowchart

