ENGINEERING PHYSICS MAJOR, B.S.

ACADEMIC STANDARDS FOR GRADUATION

1. An average G.P.A. > 2.00 is required for all professional engineering courses taken to fulfill the requirements of the Engineering Physics major (all required and elective engineering courses numbered 3000 or above) in order to graduate with an engineering physics degree.
2. A “C-” or better is required in ENGRPHYS 4930 (or GENENG 4930 with departmental permission) in order to graduate with an engineering physics degree.
3. Prerequisite courses in mathematics, science, and engineering often require a "C-" or better to advance to the next course (see course descriptions in this Catalog for specific information).
4. Only one “D/D+” in an ENGRPHYS course may be counted toward graduation with an engineering physics degree.

CURRICULUM

Course	Title	Credits
General Requirements		
General Education (https://catalog.uwplatt.edu/undergraduate/degree-requirements/bachelor-of-science-degree-core-curriculum/)		26
Mathematics Courses		
MATH 2640	Calculus and Analytic Geometry I	4
MATH 2740	Calculus and Analytic Geometry II	4
MATH 2840	Calculus and Analytic Geometry III	4
MATH 3630	Differential Equations I	3
Basic Science Courses		
CHEMSTRY 1450	Chemistry for Engineers	5
PHYSICS 2240	General Physics I	4
PHYSICS 2340	General Physics II	4
PHYSICS 3140	Modern Physics	4
Other Courses		
GENENG 1030	Introduction to Engineering Projects	1
GENENG 2030	Engineering Modeling and Design	3
COMPUTER 1430	Introduction to Computer Programming	3
Engineering Science Courses		
GENENG 2130	Engineering Mechanics-Statics	3
ELECTENG 1210	Circuit Modeling I	3
ELECTENG 2210	Circuit Modeling II	4
Select one of the following pairs:		7
ELECTENG 3220	Signals and Systems	
and		
MECHENG 3830	Mechanisms and Machines	
OR		
MECHENG 3030	Mechanical Vibrations	
and		
ELECTENG 3410	Introduction to Electrical Machines and Power Systems	
or ELECTENG 3020	Analog Electronics	
or COMPENG 2780	Logic and Digital Design	
Engineering Physics Courses		
ENGRPHYS 1020	Engineering Physics Systems	1
ENGRPHYS 3240	Applied Mechanics	4
ENGRPHYS 3640	Electric and Magnetic Fields	3
ENGRPHYS 3910	Advanced Instrumentation	1
ENGRPHYS 4010	Engineering Physics Lab	2
ENGRPHYS 4140	Applied Optics	4
ENGRPHYS 4210	Sensor Lab	2
ENGRPHYS 4330	Engineering Quantum Mechanics	3

ENGRPHYS 4530	Design, Fabrication, and Simulation of MEMS	3
ENGRPHYS 4930	Engineering Physics Senior Design (OR GENENG 4930 with departmental permission)	3
Professional Engineering Electives		**15**
(A.) All Engineering Physics majors must complete 15 or more credits of Professional Engineering Electives. The department has created suggested concentrations that are listed below to help students select electives, but students may also choose their own elective options in consultation with their advisor. All courses under the ENGINEERING CONCENTRATIONS given below as well as those listed in OTHER PROFESSIONAL ENGINEERING ELECTIVES are acceptable Professional Engineering Electives. Any course not listed will require department approval.		
(B.) Only one of COMPENG 2780, SOFTWARE 2730, GENENG 2340 and MECHENG 2630 may count toward the 15 Professional Engineering Elective credits required for graduation.		
(C.) Professional Engineering Elective courses may not "double-count" within the major. Specifically, a single course may not simultaneously satisfy an Engineering Science requirement (see above) and also count as a Professional Engineering Elective.		
(D.) Engineering Physics majors may take Engineering Physics Cooperative Education, ENGRPHYS 3950, Engineering Physics Internship, ENGRPHYS 3970, or Engineering Physics Independent Study, ENGRPHYS 4990. Co-op and internship can count towards the Professional Engineering Elective requirement provided that the student makes a presentation (arranged by the Engineering Physics department) summarizing their experience after the internship or co-op has been completed. However, no more than two credits total amongst these three courses (ENGRPHYS 3950, ENGRPHYS 3970 and ENGRPHYS 4990) may be used to satisfy the Professional Engineering Elective requirement.		
Total Credits		**123**

CONTROL SYSTEMS CONCENTRATION

Course	Title	Credits
(Take ELECTENG 3220 and MECHENG 3830 as Engineering Science courses.)		
ELECTENG 3020	Analog Electronics	4
ELECTENG 3210	Engineering Computation	3
ELECTENG 3320	Automatic Controls	4
ELECTENG 4310	Modern Control Systems	4
or COMPENG 4320	Digital Signal Processing	
or ELECTENG 4350	Discrete Time Control Systems	
or ELECTENG 4260	Measurements and Instrumentation	

MECHANISMS, MACHINES, AND SYSTEMS CONCENTRATION

Course	Title	Credits
GENENG 2340	Mechanics of Materials	4
MECHENG 3040	Engineering Materials	3
MECHENG 3330	Design of Machine Elements	3
MECHENG 3830	Mechanisms and Machines	3
MECHENG 4330	Automatic Controls	3
or MECHENG 4740	Mechanical Systems Design	
or MECHENG 4800	Finite Element Method	
or MECHENG 4830	Mechatronics	
or MECHENG 4840	Advanced Vibrations	
or MECHENG 4850	Computer-Aided Engineering	

ELECTRONICS/DIGITAL SYSTEMS CONCENTRATION

Course	Title	Credits
COMPENG 2780	Logic and Digital Design	4
COMPENG 3780	Computer Architecture	4
COMPENG 4720	Computer Organization and Design	4
or COMPENG 4750	Advanced Digital Design	
+ 3 or more additional credits of Professional Engineering Electives		3

POWER SYSTEMS CONCENTRATION

Course	Title	Credits
ELECTENG 3020	Analog Electronics	4
ELECTENG 3210	Engineering Computation	3
ELECTENG 3410	Introduction to Electrical Machines and Power Systems	4
ELECTENG 4430	Power Electronics	4
or ELECTENG 4450	Power Systems Analysis and Design	

THERMO-FLUID AND ENERGY SYSTEMS CONCENTRATION

Course	Title	Credits
MECHENG 2630	Thermodynamics	3
MECHENG 3300	Fluid Dynamics	3
MECHENG 3640	Heat Transfer	3
MECHENG 4550	Heat Transfer Applications	3
or MECHENG 4560	Computational Fluid Dynamics	
or MECHENG 4600	Energy Systems Design	
or MECHENG 4730	Thermo-Fluid Systems Design	
+ 3 or more additional credits of Professional Engineering Electives.		3

MATERIALS SCIENCE ENGINEERING CONCENTRATION

Course	Title	Credits
GENENG 2340	Mechanics of Materials	4
MECHENG 3040	Engineering Materials	3
MECHENG 3230	Manufacturing Processes	3
or MECHENG 3830	Mechanisms and Machines	
MECHENG 3330	Design of Machine Elements	3
MECHENG 4430	Advanced Materials	3
or MECHENG 4440	Failure of Materials	
or MECHENG 4450	Composite Materials	
or BME 4130	Biomechanics	

OTHER PROFESSIONAL ENGINEERING ELECTIVES

Course	Title	Credits
BME 3030	Introduction to Biomedical Engineering	3
BME 3230	Introduction to Medical Instrumentation	3
BME 4330	Biofluidics	3
ELECTENG 3130	Solid State Electronic Devices	4
ELECTENG 4040	Analog IC Design	4
ELECTENG 4060	Electronic Communications	4
ELECTENG 4360	Intelligent Control	4
ELECTENG 4440	Electric Motor Drives	4
ELECTENG 4980	Current Topics in Engineering	1-4
ENGRPHYS 3950	Engineering Physics Cooperative Education [1]	2
ENGRPHYS 3970	Engineering Physics Internship [1]	1
ENGRPHYS 4990	Independent Study in Engineering Physics [1]	1
ENGRPHYS 4980	Special Topics in Engineering Physics	1-3
INDSTENG 3730	Engineering Management	3
INDSTENG 4430	Quality Engineering	3
INDSTENG 4630	Manufacturing Systems Design	3
INDSTENG 4830	Engineering Continuous Improvement	3
MECHENG 3430	Introduction to Computational Methods	3
MECHENG 4230	Design & Control of Manufacturing Systems	3
MECHENG 4340	Noise Control	3

MECHENG 4720	Thermal Systems Laboratory	2
MECHENG 4820	Advanced Manufacturing Processes	3
MECHENG 4980	Current Topics in Engineering	1-3
SOFTWARE 2730	Introduction to Software Engineering	3
SOFTWARE 3020	Advanced Software Engineering Tools	1
SOFTWARE 3330	Intermediate Software Engineering	3
SOFTWARE 3430	Object Oriented Analysis and Design	3
SOFTWARE 3730	Software Quality	3
SOFTWARE 4130	Real-Time Embedded Systems Programming	3

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