

Bachelor of Science in Engineering Physics, Aerospace Systems

General Education Requirements (26 credits)		Hours
English	ENGL 101 and ENGL 102	6
Chemistry	CHEM 184, Foundations of Chemistry	5
Engineering Gen. education requirements	Courses from approved list in topical areas of: economics, ethics, communication, environmental concern and contemporary issues (see separate page)	15

Core Physics (26.5 credits)		Hours
PHSX 150	Seminar in Physics, Astronomy and Engineering Physics	0.5
PHSX 211 or 213	General Physics I (213 is honors/majors equivalent)	4
PHSX 212 or 214	General Physics II (214 is honors/majors equivalent)	4
PHSX 313	General Physics III	3
PHSX 316	Intermediate Physics Laboratory (with or after PHSX 313)	1
EPHX 516	Physical Measurements	4
EPHX 521	Mechanics I	3
EPHX 531	Electricity & Magnetism	3
PHSX 601	Design of Physical & Electronic Systems	4

Mathematics (18 credits)		Hours
MATH 121	Calculus I	5
MATH 122	Calculus II	5
MATH 223	Vector Calculus	3
MATH 290	Elementary Linear Algebra	2
MATH 220 or 320	Applied or Elementary Differential Equations.	3

Requirements specific for this option: Design Option in Aerospace Systems (56-57 credits)		Hours
Physics	EPHX 536, Electronic Circuit Measurement & Design	4
Aerospace Engr.	AE 245, Intro. to Aerospace Engineering	3
	AE 345, Fluid Mechanics or C&PE 511, Momentum Transfer or ME 510, Fluid Mechanics	3
	AE 421, Aerospace Computer Graphics (4) or ME 228, Computer Graphics (3)	3-4
	AE 445, Aircraft Aerodynamics and Performance	3
	AE 507, Aerospace Structures I	3
	AE 508 Aerospace Structures II (3) and AE 521, Aerospace System Design I (4) or AE 560 Spacecraft Systems (3) and AE 523, Space Systems Design (4)	3+4
	AE 545, Fundamentals of Aerodynamics	5
	AE 550, Dynamics of Flight I	3
	AE 551, Dynamics of Flight II	4
	AE 572, Fundamentals of Jet Propulsion	3
Engineering	C&PE 121, Intro. to Computers in Engineering, or EECS 138, Intro. to Computing or EECS 168, Programming I, or ME 208, Intro. to Digital Computational Methods in Mechanical Engr.	3
	C&PE 221 or ME 312, Basic Engineering Thermodynamics	3
	CE 301, Statics & Dynamics	5
	CE 310, Strength of Materials or ME 311, Mechanics of Materials	4

126.5 credits

Suggested Schedule

B.S. Engineering Physics, Aerospace Systems

(A)=aircraft track, (S)=spacecraft track

Fall Semester

Spring Semester

Freshman Year			
AE 245, <i>Intro To Aerospace Engineering</i>	3	C&PE 121, <i>Intro. Comp. in Engr.</i>	3
CHEM 184, <i>Found. Chemistry I</i>	5	ENGL 102, <i>Critical Reading & Writing</i>	3
ENGL 101, <i>Composition</i>	3	MATH 122, <i>Calculus II</i>	5
MATH 121, <i>Calculus I</i>	5	PHSX 211/213, <i>General Physics I</i>	4
PHSX 150, <i>Seminar Phsx, Astr, Ephx</i>	0.5		
	16.5		15

Sophomore Year			
AE 345, <i>Fluid Mechanics</i>	3	AE 445, <i>Aircraft Aerodyn. & Perform.</i>	3
CE 301, <i>Statics & Dynamics</i>	5	C&PE 221, <i>Basic Engr. Thermodyn.</i>	3
PHSX 212/214, <i>General Physics II</i>	4	CE 310, <i>Strength of Materials</i>	4
MATH 223, <i>Vector Calculus</i>	3	MATH 220/320, <i>Differential Equations</i>	3
MATH 290, <i>Linear Algebra</i>	2	PHSX 313, <i>General Physics III</i>	3
		PHSX 316, <i>Intermediate Physics Lab</i>	1
	17		17

Junior Year			
AE 507, <i>Aerospace Structures I</i>	3	AE 421, <i>Aero. Computer Graphics</i>	4
AE 545, <i>Fund. of Aerodyn.</i>	5	AE 551, <i>Dynamics of Flight II</i>	4
AE 550, <i>Dynamics of Flight I</i>	3	AE 572, <i>Fund. of Jet Propulsion</i>	3
EPHX 521, <i>Mechanics I</i>	3	AE 508, <i>Aerospace Structures II (A)</i> or EPHX 536, <i>Elec. Circ. Ms&Dsn (S)</i>	3 or 4
General Education	3		
	17		14-15

Senior Year			
AE 521, <i>Aero. Sys. Design I (A)</i> or AE 560, <i>Spacecraft Systems (S)</i>	4 or 3	EPHX 536, <i>Elec. Circ. Ms & Dsgn (A)</i> or AE 523, <i>Space Systems Design (S)</i>	4
EPHX 516, <i>Physical Measurements</i>	4	EPHX 601, <i>Dsgn. Phys. & Elect. Systems</i>	4
EPHX 531, <i>Electricity & Magnetism</i>	3	General Education	6
General Education	6		
	16-17		14

Bachelor of Science in Engineering Physics, Chemical Systems

General Education Requirements (26 credits)		Hours
English	ENGL 101 and ENGL 102	6
Chemistry	CHEM 184, Foundations of Chemistry	5
Engineering Gen. education requirements	Courses from approved list in topical areas of: economics, ethics, communication, environmental concern and contemporary issues (see page 31)	15

Core Physics (26.5 credits)		Hours
PHSX 150	Seminar in Physics, Astronomy and Engineering Physics	0.5
PHSX 211 or 213	General Physics I (213 is honors/majors equivalent)	4
PHSX 212 or 214	General Physics II (214 is honors/majors equivalent)	4
PHSX 313	General Physics III	3
PHSX 316	Intermediate Physics Laboratory (with or after PHSX 313)	1
EPHX 516	Physical Measurements	4
EPHX 521	Mechanics I	3
EPHX 531	Electricity & Magnetism	3
PHSX 601	Design of Physical & Electronic Systems	4

Mathematics (18 credits)		Hours
MATH 121	Calculus I	5
MATH 122	Calculus II	5
MATH 223	Vector Calculus	3
MATH 290	Elementary Linear Algebra	2
MATH 220 or 320	Applied or Elementary Differential Equations.	3

Requirements specific for this option: Design Option in Chemical Systems (57 credits)		Hours
Physics	EPHX 536, Electronic Circuit Measurement & Design	4
	EPHX 511, Intro Quantum Mechanics	3
Chemistry	CHEM 188, Foundations of Chemistry II	5
	CHEM 624, Organic Chemistry I	3
	CHEM 646, Physical Chemistry I	3
Chem & Petr.Eng	C&PE 121, Intro. to Computers in Engineering, or EECS 138, Intro. to Computing	3
	C&PE 211, Material & Energy Balances	3
	C&PE 221 or ME 312, Basic Engr. Thermodynamics	3
	C&PE 511, Momentum Transfer , or AE 345/ME 510 Fluid Mechanics	3
	C&PE 512, Process Engr. Thermodynamics	3
	C&PE 521 or ME 612, Heat Transfer	3
	C&PE 522, Economic Appraisal of Chemical & Petroleum Projects	2
	C&PE 523, Mass Transfer	4
	C&PE 524, Chemical Engineering Kinetics & Reactor Design	3
	C&PE 613, Chemical Engr. Design I	4
	C&PE 615, Intro. to Process Dynamics and Control	3
	C&PE 616, Chemical Engr. Lab I	3
	C&PE 623, Chemical Engr. Design II	2

127.5 credits

Suggested Schedule

B.S. Engineering Physics, Chemical Systems

Fall Semester

Spring Semester

Freshman Year			
General Education	3	CHEM 188, <i>Found. Chemistry II</i>	5
CHEM 184, <i>Found. Chemistry I</i>	5	ENGL 102, <i>Critical Reading & Writing</i>	3
ENGL 101, <i>Composition</i>	3	MATH 122, <i>Calculus II</i>	5
MATH 121, <i>Calculus I</i>	5	PHSX 211/213, <i>General Physics I</i>	4
PHSX 150, <i>Seminar in Physics, Astronomy & Engineering Physics</i>	0.5		
	16.5		17

Sophomore Year			
C&PE 211, <i>Material & Energy Balances</i>	3	PHSX 313, <i>General Physics III</i>	3
PHSX 212/214, <i>General Physics II</i>	4	PHSX 316, <i>Intermediate Physics Lab</i>	1
MATH 223, <i>Vector Calculus</i>	3	MATH 220/320, <i>Differential Equations</i>	3
MATH 290, <i>Linear Algebra</i>	2	CHEM 624, <i>Organic Chemistry I</i>	3
C&PE 121, <i>Intro to Comp. Engr.</i>	3	C&PE 221, <i>Basic Engr. Thermodyn.</i>	3
		General Education	3
	15		16

Junior Year			
CHEM 646, <i>Intro. to Physical Chemistry</i>	3	C&PE 521, <i>Heat Transfer</i>	3
C&PE 511, <i>Momentum Transfer</i>	3	C&PE 523, <i>Mass Transfer</i>	4
C&PE 512, <i>Proc. Engr. Thermo.</i>	3	C&PE 524, <i>Kinetics & Reactor Design</i>	3
C&PE 522, <i>Econ. Apprais. C&PE Proj.</i>	2	EPHX 536, <i>Elec. Circ. Meas. & Dsgn</i>	4
EPHX 521, <i>Mechanics I</i>	3	General Education	3
	14		17

Senior Year			
EPHX 516, <i>Physical Measurements</i>	4	EPHX 511, <i>Intro. Quantum Mechanics</i>	3
EPHX 531, <i>Electricity & Magnetism</i>	3	EPHX 601, <i>Dsgn. Phys & Elect. Systems</i>	4
C&PE 613, <i>Chem. Eng. Design I</i>	4	C&PE 623, <i>Chem. Engr. Design II</i>	2
C&PE 615, <i>Int. Proc. Dyn & Cnt.</i>	3	General Education	6
C&PE 616, <i>Chem. Eng. Lab I.</i>	3		
	17		15

Bachelor of Science in Engineering Physics, Digital Electronic Systems

General Education Requirements (26 credits)		Hours
English	ENGL 101 and ENGL 102	6
Chemistry	CHEM 184, Foundations of Chemistry	5
Engineering Gen. education requirements	Courses from approved list in topical areas of: economics, ethics, communication, environmental concern and contemporary issues (see page 31)	15

Core Physics (26.5 credits)		Hours
PHSX 150	Seminar in Physics, Astronomy and Engineering Physics	0.5
PHSX 211 or 213	General Physics I (213 is honors/majors equivalent)	4
PHSX 212 or 214	General Physics II (214 is honors/majors equivalent)	4
PHSX 313	General Physics III	3
PHSX 316	Intermediate Physics Laboratory (with or after PHSX 313)	1
EPHX 516	Physical Measurements	4
EPHX 521	Mechanics I	3
EPHX 531	Electricity & Magnetism	3
PHSX 601	Design of Physical & Electronic Systems	4

Mathematics (18 credits)		Hours
MATH 121	Calculus I	5
MATH 122	Calculus II	5
MATH 223	Vector Calculus	3
MATH 290	Elementary Linear Algebra	2
MATH 220 or 320	Applied or Elementary Differential Equations	3

Requirements specific for Design Option in Digital Electronic Systems (58 credits)		Hours
Physics	EPHX 511, Intro Quantum Mechanics	3
Elect. Engr & Computer Sci.	EECS 140, Intro to Digital Logic Design (or EECS 141, honors)	4
	EECS 168, Programming I	4
	EECS 211, Circuits I	3
	EECS 212, Circuits II	4
	EECS 268, Programming II	4
	EECS 312, Electronic Circuits I.	3
	EECS 360, Signal and System Analysis	4
	EECS 388, Computer Systems & Assembly Language	4
	EECS 443, Digital Systems Design	4
	EECS 448, Software Engineering I	3
	EECS 461, Probability & Statistics	3
	EECS 470, Electronic Devices & Properties of Materials	3
	EECS 541, Computer Systems Design Lab I	3
	EECS 542, Computer Systems Design Lab II	3
	EECS 645 Computer Architecture or 643, Advanced Computer Architecture	3
	Elective: Allowed courses have been EECS 546, 644,670,690,713 as well as 672 and 678	3

128.5 credits

Suggested Schedule

B.S. Engineering Physics, Digital Electronic Systems

Fall Semester

Spring Semester

Freshman Year			
CHEM 184, <i>Found. Chemistry I</i>	5	ENGL 102, <i>Critical Reading & Writing</i>	3
ENGL 101, <i>Composition</i>	3	MATH 122, <i>Calculus II</i>	5
MATH 121, <i>Calculus I</i>	5	PHSX 211/213, <i>General Physics I</i>	4
PHSX 150, <i>Seminar in Physics, Astronomy & Engineering Physics</i>	0.5	EECS 168, <i>Programming I</i>	4
General Education	3		
	16.5		16

Sophomore Year			
PHSX 212/214, <i>General Physics II</i>	4	PHSX 313, <i>General Physics III</i>	3
MATH 220 or 320, <i>Differential Eqtns.</i>	3	PHSX 316, <i>Intermediate Physics Lab</i>	1
MATH 290, <i>Linear Algebra</i>	2	MATH 223, <i>Vector Calculus</i>	3
EECS 140, <i>Intro. to Digital Logical Dsgn</i>	4	EECS 212, <i>Circuits II</i>	4
EECS 211, <i>Circuits I</i>	3	EECS 268, <i>Programming II</i>	4
	16		15

Junior Year			
EPHX 521, <i>Mechanics I</i>	3	EPHX 511, <i>Intro. Quantum Mechanics</i>	3
EECS 360, <i>Signal & System Analysis</i>	4	EECS 443, <i>Digital Systems Design</i>	4
EECS 388, <i>Comp. Syst & Assemb. Lang.</i>	4	EECS 448, <i>Software Engineering</i>	3
EECS 312, <i>Electronic Circuits I</i>	3	EECS 461, <i>Probability & Statistics</i>	3
General Education	3	General Education	3
	17		16

Senior Year			
EPHX 516, <i>Physical Measurements</i>	4	EECS 542, <i>Comp. Syst. Design Lab II</i>	3
EPHX 531, <i>Electricity & Magnetism</i>	3	EPHX 601, <i>Dsgn. Phys & Elect. Systems</i>	4
EECS 470, <i>Electronic Devices & Properties of Materials</i>	3	EECS 645, <i>Computer Architecture</i>	3
EECS 541, <i>Comp. Syst. Design Lab I</i>	3	General Education	6
EECS elective	3		
	16		16

Bachelor of Science in Engineering Physics, Electromechanical Control Systems

General Education Requirements (26 credits)		Hours
English	ENGL 101 and ENGL 102	6
Chemistry	CHEM 184, Foundations of Chemistry	5
Engineering Gen. education requirements	Courses from approved list in topical areas of: economics, ethics, communication, environmental concern and contemporary issues (see page 31).	15

Core Physics (26.5 credits)		Hours
PHSX 150	Seminar in Physics, Astronomy and Engineering Physics	0.5
PHSX 211 or 213	General Physics I (213 is honors/majors equivalent)	4
PHSX 212 or 214	General Physics II (214 is honors/majors equivalent)	4
PHSX 313	General Physics III	3
PHSX 316	Intermediate Physics Laboratory (with or after PHSX 313)	1
EPHX 516	Physical Measurements	4
EPHX 521	Mechanics I	3
EPHX 531	Electricity & Magnetism	3
PHSX 601	Design of Physical & Electronic Systems	4

Mathematics (18 credits)		Hours
MATH 121	Calculus I	5
MATH 122	Calculus II	5
MATH 223	Vector Calculus	3
MATH 290	Elementary Linear Algebra	2
MATH 220 or 320	Applied or Elementary Differential Equations	3

Requirements specific for Design Option in Electromechanical Control Systems (57 credits)		Hours
Physics	EPHX 511, Intro Quantum Mechanics	3
Elect. Engr & Computer Sci.	EECS 140, Intro to Digital Logic Design (or EECS 141, honors)	4
	EECS 168, Programming I	4
	EECS 211, Circuits I	3
	EECS 212, Circuits II	4
	EECS 268, Programming II	4
	EECS 312, Electronic Circuits I.	3
	EECS 360, Signal and System Analysis	4
	EECS 444 or ME 682, Control Systems	3
Mechanical Engr.	ME 228, Computer Graphics or AE 421	3
	ME 311 (3-4 credits), Mechanics of Materials or CE 310 (4 credits), Strength of Materials	4
	ME 312 or C&PE 221, Basic Engr. Thermodynamics	3
	ME 501, Mechanical Engr. Design Process	3
	ME 528, Mechanical Design I.	3
	ME 642 or 643, Design Project B or C (see notes below for engineering elective)	3
	ME 708, Microcomputer Applications in ME	3
	Additional engineering elective; ME 642, Design Project B – Formula Car , requires ME 627 to be taken in the previous semester as the engineering elective. ME 643 (Design Project C – Biomechanics) requires ME 633 to be taken in the previous semester as the engineering elective. ME 641 (Design Project A) is also available, but has several pre-requisite courses that would need to be taken.	3

127.5 credits

Suggested Schedule

B.S. Engineering Physics, Electromechanical Control Systems

Fall Semester

Spring Semester

Freshman Year			
CHEM 184, <i>Found. Chemistry I</i>	5	ENGL 102, <i>Critical Reading & Writing</i>	3
ENGL 101, <i>Composition</i>	3	MATH 122, <i>Calculus II</i>	5
MATH 121, <i>Calculus I</i>	5	PHSX 211/213, <i>General Physics I</i>	4
PHSX 150, <i>Seminar in Physics, Astronomy & Engineering Physics</i>	0.5	EECS 168, <i>Programming I</i>	4
ME 228, <i>Computer Graphics</i>	3		
	16.5		16

Sophomore Year			
PHSX 212/214, <i>General Physics II</i>	4	PHSX 313, <i>General Physics III</i>	3
MATH 220 or 320, <i>Differential Eqtns.</i>	3	PHSX 316, <i>Intermediate Physics Lab</i>	1
MATH 290, <i>Linear Algebra</i>	2	MATH 223, <i>Vector Calculus</i>	3
EECS 140, <i>Intro. to Digital Logical Dsgn</i>	4	EECS 212, <i>Circuits II</i>	4
EECS 211, <i>Circuits I</i>	3	EECS 268, <i>Programming II</i>	4
	16		15

Junior Year			
EPHX 521, <i>Mechanics I</i>	3	EPHX 511, <i>Intro. Quantum Mechanics</i>	3
EECS 360, <i>Signal & System Analysis</i>	4	EECS 312, <i>Electronic Circuits I</i>	3
ME 311, <i>Mechanics of Materials</i>	4	ME 501, <i>Mech. Eng. Design Process</i>	3
ME 312, <i>Basic Engr. Thermo.</i>	3	ME 528, <i>Mechanical Design I</i>	3
General Education	3	General Education	3
	17		15

Senior Year			
EPHX 516, <i>Physical Measurements</i>	4	EPHX 601, <i>Dsgn. Phys & Elect. Systems</i>	4
EPHX 531, <i>Electricity & Magnetism</i>	3	ME 642 or 643, <i>Design Project B or C</i>	3
ME 708, <i>Microcomp. Appl. in Mechanical Engineering</i>	3	EECS 444, <i>Control Systems</i> or ME 682	3
Engineering Elective	3	General Education	6
General Education	3		
	16		16