

Bachelor of Science in Engineering Physics
Design Option in Aerospace Systems
(128 hours Total)

Common Core (70 hours)

PHYSICS (26 hours)		CHEMISTRY (5 hours)	
PHSX 211 or 213 General Physics I ¹	4	CHEM 184 Foundations of Chem. I	<u>5</u>
PHSX 212 or 214 General Physics II ¹	4		5
PHSX 313+316 General Physics III	4		
EPHX 516 Physical Meas.	4	ENGLISH (6 hours)	
EPHX 521 Mechanics I	3	ENGL 101 Composition	3
EPHX 531 Electricity & Magnetism	3	ENGL 102 Critical Reading & Writing	<u>3</u>
EPHX 601 Dsgn. Phys. & Elec. Syst.	<u>4</u>		6
	26		
MATHEMATICS (18 hours)		GENERAL EDUCATION RQMTS. (15 hours)²	
MATH 121 Calculus I	5	Economics elective	3
MATH 122 Calculus II	5	Ethics elective	3
MATH 223 Vector Calculus	3	Communication elective	3
MATH 290 Elementary Linear Algebra	2	Environmental Concern elective	3
MATH 220 or 320 Differential Equations	<u>3</u>	Contemporary Issues elective	<u>3</u>
	18		15

REQUIREMENTS SPECIFIC TO THIS OPTION (58 hours)

AEROSPACE ENGINEERING (35 hours)		CHEMICAL&PETROLEUM ENGR. (6 hours)	
AE 245 Intro to Aerosp. Eng.	3	C&PE 121 Intro. Comp. in Engr.	3 ⁴
AE 345 Fluid Mechanics	3 ³	C&PE 221 Basic Eng. Thermodynamics	<u>3⁵</u>
AE 421 Aero. Computer Graphics	4		6
AE 445 Aircraft Aero. And Perf	3	CIVIL ENGINEERING (9 hours)	
AE 507 Aerospace Structures I	3	CE 301 Statics and Dynamics	5
AE 521 Aerospace Syst. Dsgn. I	4	CE 310 Strength of Materials	<u>4</u>
AE 522 Aerospace Syst. Dsgn. II	or		9
AE 523 Spacecraft Syst. Dsgn.	or		
AE 524 Propulsion Syst. Dsgn. I	4	PHYSICS (4 hours)	
AE 545 Fund. Of Aerodynamics	5	EPHX 536. Elec. Circ. Meast & Dsgn	4
AE 550 Dynamics of Flight I	3		
AE 551 Dynamics of Flight II	4		
AE 572 Fund. of Jet Propulsion	<u>3</u>		
	39		

Notes:

¹ -- Majors are encouraged to take PHSX 213 and 214, the Honors sections of 211 and 212.

² -- See the list of courses allowed as General Education Component Electives.

³ -- These courses may be available in summer sessions

⁴ -- EECS 138 *Introduction to Computing* may be substituted for C&PE 121

⁵ -- ME 312 *Basic Engineering Thermodynamics* may be substituted for C&PE 221

Bachelor of Science in Engineering Physics Design Option in Aerospace Systems

Fall Semesters	Suggested Schedule		Spring Semesters
	Freshman Year		
AE 245 <i>Intro. to Aerosp. Eng.</i>	3	C&PE 121 <i>Intro. Comp. in Engr.</i>	3
CHEM 184 <i>Found. Chem. 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 or 213 <i>General Physics I</i>	4 ^a
	16		15
	Sophomore Year		
AE 345 <i>Fluid Mechanics</i>	3 ^c	AE 445 <i>Aircraft Aero. and Perf.</i>	3
CE 301 <i>Statics and Dynamics</i>	5	C&PE 221 <i>Basic Engr. Thermodynamics</i>	3
PHSX 212 or 214 <i>General Physics II</i>	4 ^a	CE 310 <i>Strength of Materials</i>	4
MATH 223 <i>Vector Calculus</i>	3	MATH 220 or 320 <i>Differential Eqns</i>	3
MATH 290 <i>Elem. Linear Algebra</i>	2	PHSX 313 <i>General Physics III</i>	3
		PHSX 316 <i>Inter. 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 Aerodynamics</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	EPHX 536 <i>Elec. Circ. Meas & Dsgn.</i>	4
General Education Elective	3 ^b		
	17		15
	Senior Year		
AE 521 <i>Aero. Syst. Design. I</i>	4	AE 522 <i>Aero. Syst. Dsgn. II</i>	4
EPHX 516 <i>Physical Meas.</i>	4	or AE 523 or AE 524	
EPHX 531 <i>Electricity & Magnetism</i>	3	EPHX 601 <i>Dsgn. Phys. & Elec. Syst.</i>	4
General Education Electives	6 ^b	General Education Electives	6 ^b
	17		14
		Total 128	

Notes:

^a -- Majors are encouraged to take PHSX 213 and 214, the Honors sections of 211 and 212.

^b – See the list of courses allowed as General Education Component Electives. One course from each of the five areas, Economics, Ethics, Communication, Environmental Concern, and Contemporary Issues, is required.

^c - This course may be offered in summer sessions.

Bachelor of Science in Engineering Physics

Design Option in Chemical Systems

(128 hours total)

Common Core (70 hours)

PHYSICS (26 hours)		CHEMISTRY (5 hours)	
PHSX 211 or 213 General Physics I ¹	4	CHEM 184 Foundations of Chem. I	<u>5</u>
PHSX 212 or 214 General Physics II ¹	4		5
PHSX 313+316 General Physics III	4	ENGLISH (6 hours)	
EPHX 516 Physical Meas.	4	ENGL 101 Composition	3
EPHX 521 Mechanics I	3	ENGL 102 Critical Reading & Writing	<u>3</u>
EPHX 531 Electricity & Magnetism	3		6
EPHX 601 Dsgn. Phys. & Elec. Syst.	<u>4</u>	GENERAL EDUCATION RQMTS. (15 hours) ²	
	26	Economics elective	3
MATHEMATICS (18 hours)		Ethics elective	3
MATH 121 Calculus I	5	Communication elective	3
MATH 122 Calculus II	5	Environmental Concern elective	3
MATH 223 Vector Calculus	3	Contemporary Issues elective	<u>3</u>
MATH 290 Elementary Linear Algebra	2		15
MATH 220 or 320 Differential Equations	<u>3</u>		
	18		

Requirements Specific to this Option (58 hours)

CHEM. & PETR. ENGR. (39 hours)		CHEMISTRY (12 hours)	
C&PE 121 Intro. Computers in Engr.	3 ³	CHEM 188 Foundations of Chem. II	5
C&PE 211 Material & Energy Balances	3	CHEM 624 Organic Chem. I	3
C&PE 221 Basic Eng. Thermodynamics	3 ⁴	CHEM 646 Intro. To Physical Chem.	<u>4</u>
C&PE 511 Momentum Transfer	3		12
C&PE 512 Process Engr. Thermodynamics	3	PHYSICS (6 hours)	
C&PE 521 Heat Transfer	3	EPHX 536 Elec. Circ. Meast. & Dsgn.	4
C&PE 522 Economic Appraisal	2	EPHX 611 Intro Quantum Mechanics	<u>3</u>
C&PE 523 Mass Transfer	4		7
C&PE 524 Kinetics & Reactor Dsgn.	3		
C&PE 613 Chemical Engr. Dsgn. I	4		
C&PE 615 Intro. Process Dyn. & Cntr	3		
C&PE 616 Chemical Engr. Lab. I	3		
C&PE 623 Chemical Engr. Dsgn. II	<u>2</u>		
	39		

Notes:

¹ -- Majors are encouraged to take PHSX 213 and 214, the Honors sections of 211 and 212.

² -- See the list of courses allowed as General Education Component Electives.

³ -- EECS 138 *Introduction to Computing* may be substituted for C&PE 121

⁴ -- ME 312 *Basic Engineering Thermodynamics* may be substituted for C&PE 221

Bachelor of Science in Engineering Physics
Design Option in Chemical Systems
Suggested Schedule

Fall Semesters

CHEM 184 <i>Found. Chem. I</i>	5
ENGL 101 <i>Composition</i>	3
MATH 121 <i>Calculus I</i>	5
C&PE 121 <i>Intro. Comp. Engr.</i>	3
16	

Spring Semesters

Freshman Year

CHEM 188 <i>Found. Chem. II</i>	5
ENGL 102 <i>Critical Reading & Writing</i>	3
MATH 122 <i>Calculus II</i>	5
PHSX 211 or 213 <i>General Physics I</i>	4 ^a
17	

Sophomore Year

C&PE 211 <i>Mat'l & Energy Balances</i>	3
PHSX 212 or 214 <i>General Physics II</i>	4 ^a
MATH 223 <i>Vector Calculus</i>	3
MATH 290 <i>Elem. Linear Algebra</i>	2
General Education Elective	3 ^b
15	

PHSX 313 <i>General Physics III</i>	3
PHSX 316 <i>Inter. Physics Lab</i>	1
CHEM 624 <i>Organic Chemistry I</i>	3
MATH 220 or 320 <i>Differential Eqns</i>	3
C&PE 221 <i>Basic Engr. Thermodynamics</i>	3
General Education Elective	3 ^b
16	

Junior Year

CHEM 646 <i>Intro. to Physical Chemistry</i>	4
C&PE 511 <i>Momentum Transfer</i>	3
C&PE 512 <i>Proc. Engr. Thermo.</i>	3
C&PE 522 <i>Econ. Appr. C&PE Projects</i>	2
EPHX 521 <i>Mechanics I</i>	3
15	

C&PE 521 <i>Heat Transfer</i>	3
C&PE 523 <i>Mass Transfer</i>	4
C&PE 524 <i>Ch.E. Kin. & Reactor Design</i>	3
EPHX 536 <i>Elec. Circ. Meas. & Dsgn</i>	4
General Education Elective	3 ^b
17	

Senior Year

C&PE 613 <i>Chem. Eng Design I</i>	4
C&PE 615 <i>Int. Proc. Dyn. & Cnt.</i>	3
C&PE 616 <i>Chem. Eng. Lab.</i>	3
EPHX 516 <i>Phys. Meas.</i>	4
EPHX 531 <i>Electricity & Magnetism</i>	3
17	

C&PE 623 <i>Ch.E. Design II</i>	2
EPHX 601 <i>Dsgn of Phys. & Elec Syst.</i>	4
EPHX 611 <i>Intro. Quantum Mechanics</i>	3
General Education Electives	6 ^b
15	

Total 128

Notes:

^a -- Majors are encouraged to take PHSX 213 and 214, the Honors sections of 211 and 212.

^b – See the list of courses allowed as General Education Component Electives. One course from each of the five areas, Economics, Ethics, Communication, Environmental Concern, and Contemporary Issues, is required.

Bachelor of Science in Engineering Physics
Design Option in Digital Electronic Systems
(128 hours total)

Common Core (70 hours)

PHYSICS (26 hours)		CHEMISTRY (5 hours)	
PHSX 211 or 213 General Physics I ¹	4	CHEM 184 Foundations of Chem. I	<u>5</u>
PHSX 212 or 214 General Physics II ¹	4		5
PHSX 313+316 General Physics III	4	ENGLISH (6 hours)	
EPHX 516 Physical Meas.	4	ENGL 101 Composition	3
EPHX 521 Mechanics I	3	ENGL 102 Critical Reading & Writing	<u>3</u>
EPHX 531 Electricity & Magnetism	3		6
EPHX 601 Dsgn. Phys. & Elec Syst.	<u>4</u>		
	26	GENERAL EDUCATION RQMTS. (15 hours) ²	
MATHEMATICS (18 hours)		Economics elective	3
MATH 121 Calculus I	5	Ethics elective	3
MATH 122 Calculus II	5	Communication elective	3
MATH 223 Vector Calculus	3	Environmental Concern elective	3
MATH 290 Elementary Linear Algebra	2	Contemporary Issues elective	<u>3</u>
MATH 220 or 320 Differential Equations	<u>3</u>		15
	18		

Requirements Specific to this Option (58 hours)

ELEC. ENGR. & COMP. SCI. (55 hours)			
EECS 140 Intro to Digital Logic Design	4 ³	EECS 443 Digital Syst. Dsgn.	4
EECS 168 Programming I	4	EECS 448 Software Engr. I	3
EECS 211 Circuits I	3	EECS 461 Probability & Statistics	3
EECS 212 Circuits II	4	EECS 470 Elec. Dev. & Prop. of Mat.	3
EECS 268 Programming II	4	EECS 541 Comp. Syst. Dsgn. Lab I	3
EECS 312 Electronic Circ. I	3	EECS 542 Comp. Syst. Dsgn. Lab II	3
EECS 360 Sign. & Syst. Anal.	4	EECS 645 Computer Architecture	3
EECS 388 Comp. Syst. & Assm. Lang.	<u>4</u>	EECS Elective	<u>3⁴</u>
	30		25
		Physics (3 hours)	
		EPHX 611 Intro. Quantum Mechanics	<u>3</u>
			3

Notes:

¹ -- Majors are encouraged to take PHSX 213 and 214, the Honors sections of 211 and 212.

² -- See the list of courses allowed as General Education Component Electives.

³ -- There is also an honors version of this course, EECS 241 (fall semester, 2004)

⁴ - Allowed courses are EECS 546, 644, 670, 690 and 713.

Bachelor of Science in Engineering Physics

Design Option in Digital Electronic Systems

Suggested Schedule

Fall Semesters

CHEM 184 *Found. Chem. I*
 ENGL 101 *Composition*
 MATH 121 *Calculus I*
 General Education Elective

5
 3
 5
 3^a
16

Spring Semesters

Freshman Year

PHSX 211 or 213 *General Physics I*
 ENGL 102 *Critical Reading & Writing*
 MATH 122 *Calculus II*
 EECS 168 *Programming I*

4^b
 3
 5
 4
16

Sophomore Year

EECS 211 *Circuits I*
 EECS 140 *Intro. To Digital Logic Design*
 PHSX 212 or 214 *General Physics II*
 MATH 220 or 320 *Differential Eqns*
 MATH 290 *Elem. Linear Algebra*

3
 4
 4^b
 3
 2
16

EECS 212 *Circuits II*
 EECS 268 *Programming II*
 MATH 223 *Vector Calculus*
 PHSX 313 *General Physics III*
 PHSX 316 *Inter. Physics Lab*

4
 4
 3
 3
 1
15

Junior Year

EECS 312 *Electronic Circuits I*
 EECS 360 *Signal & System Analysis*
 EECS 388 *Comp. Syst. & Assembly Lang.*
 EPHX 521 *Mechanics I*
 General Education Elective

3
 4
 4
 3
 3^a
17

EECS 443 *Digital Systems Design*
 EECS 448 *Software Engineering I*
 EECS 461 *Probability & Statistics*
 EPHX 611 *Intro. Quantum Mechanics*
 General Education Elective

4
 3
 3
 3
 3^a
16

Senior Year

EECS 470 *Elec. Devices & Prop of Matls.*
 EECS 541 *Comp. Syst. Design Lab. I*
 EECS Elective
 EPHX 516 *Physical Meas.*
 EPHX 531 *Electricity & Magnetism*

3
 3
 3^c
 4
 3
16

EECS 542 *Comp. Syst. Design Lab. II*
 EECS 645 *Computer Architecture*
 EPHX 601 *Dsgn Phys & Elec. Syst.*
 General Education Electives

3
 3
 4
 6^a
16

Total 128

Notes:

^a – See the list of courses allowed as General Education Component Electives. One course from each of the five areas, Economics, Ethics, Communication, Environmental Concern, and Contemporary Issues, is required.

^b -- Majors are encouraged to take PHSX 213 and 214, the Honors sections of 211 and 212.

^c - Allowed courses are EECS 546, 644, 670, 690 and 713.

Bachelor of Science in Engineering Physics
Design Option in Electromechanical Control Systems
(127 hours total)

Common Core (70 hours)

PHYSICS (26 hours)		CHEMISTRY (5 hours)	
PHSX 211 or 213 General Physics I ¹	4	CHEM 184 Foundations of Chem. I	<u>5</u>
PHSX 212 or 214 General Physics II ¹	4		5
PHSX 313+316 General Physics III	4		
EPHX 516 Physical Meas.	4	ENGLISH (6 hours)	
EPHX 521 Mechanics I	3	ENGL 101 Composition	3
EPHX 531 Electricity & Magnetism	3	ENGL 102 Critical Reading & Writing	<u>3</u>
EPHX 601 Dsgn. Phsx & Elec. Syst.	<u>4</u>		6
	26		
		GENERAL EDUCATION RQMTS. (15 hours)²	
MATHEMATICS (18 hours)		Economics elective	3
MATH 121 Calculus I	5	Ethics elective	3
MATH 122 Calculus II	5	Communication elective	3
MATH 223 Vector Calculus	3	Environmental Concern elective	3
MATH 290 Elementary Linear Algebra	2	Contemporary Issues elective	<u>3</u>
MATH 220 or 320 Differential Equations	<u>3</u>		15
	18		

REQUIREMENTS SPECIFIC TO THIS OPTION (57 HOURS)

ELEC. ENGR. & COMP. SCI. (29 hours)		MECHANICAL ENGINEERING (25 hours)	
EECS 140 Intro to Digital Logic Design	4 ³	ME 228 Computer Graphics	3
EECS 168 Programming I	4	ME 311 Mechanics of Materials	4
EECS 211 Circuits I	3	ME 312 Basic Eng, Thermodynamics	3 ⁴
EECS 212 Circuits II	4	ME 501 Mech. Eng. Design Process	3
EECS 268 Programming II	4	ME 528 Mechanical Design I	3
EECS 312 Electronic Circuits I	3	ME 642 or 643 Design Project B or C	3 ⁵
EECS 360 Signal & System Anal.	4	ME 708 Microcomp. Appl. in ME	3
EECS 444 Control Systems or	3	Additional Engineering elective	<u>3⁵</u>
AE 750 Applied Optl Control or			25
or AE 753 Digital Flight Controls			
	29		
		Physics (3 hours)	
		EPHX 611 Intro Quantum Mechanics	<u>3</u>
			3

Notes:

¹ -- Majors are encouraged to take PHSX 213 and 214, the Honors sections of 211 and 212.

² -- See the list of courses allowed as General Education Component Electives.

³ -- There is also an honors version of this course, EECS 241

⁴ -- C&PE 221 *Basic Engineering Thermodynamics* may be substituted for ME 312.

⁵ -- 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 prerequisite courses that would need to be taken.

Bachelor of Science in Engineering Physics

Design Option in Electromechanical Control Systems

Suggested Schedule

Fall Semesters

Spring Semesters

Freshman Year

CHEM 184 <i>Found. Chem. I</i>	5	PHSX 211 or 213 <i>General Physics I</i>	4 ^a
ENGL 101 <i>Composition</i>	3	ENGL 102 <i>Critical Reading & Writing</i>	3
MATH 121 <i>Calculus I</i>	5	MATH 122 <i>Calculus II</i>	5
ME 228 <i>Computer Graphics</i>	3	EECS 168 <i>Programming I</i>	4
	16		16

Sophomore Year

EECS 211 <i>Circuits I</i>	3	EECS 212 <i>Circuits II</i>	4
EECS 140 <i>Intro to Digital Design</i>	4	EECS 268 <i>Programming II</i>	4
PHSX 212 or 214 <i>General Physics II</i>	4 ^a	MATH 223 <i>Vector Calculus</i>	3
MATH 220 or 320 <i>Differential Eqns</i>	3	PHSX 313 <i>General Physics III</i>	3
MATH 290 <i>Elem. Linear Algebra</i>	2	PHSX 316 <i>Inter. Physics Lab</i>	1
	16		15

Junior Year

EECS 360 <i>Signal & System Analysis</i>	4	EECS 312 <i>Electronic Circuits I</i>	3
EPHX 521 <i>Mechanics I</i>	3	EPHX 611 <i>Intro. Quantum Mechanics</i>	3
ME 311 <i>Mechanics of Materials</i>	4	ME 501 <i>Mech. Eng. Design Process</i>	3
ME 312 <i>Basic Eng. Thermodynamics</i>	3	ME 528 <i>Mechanical Design I</i>	3
General Education Elective	3 ^b	General Education Elective	3 ^b
	17		15

Senior Year

EPHX 516 <i>Physical Meas.</i>	4	EECS 444 <i>Control Systems</i>	3
EPHX 531 <i>Electricity & Magnetism</i>	3	or AE 750 or AE 753	
ME 708 <i>Microcomp. Appl. in Mech. Eng.</i>	3	EPHX 601 <i>Dsgn Phys. & Elec Syst.</i>	4
Engineering Elective	3 ^c	ME 642 or 643 <i>Design Project B or C</i>	3 ^c
General Education Elective	3 ^b	General Education Electives	6 ^b
	16		16

TOTAL 127

Notes:

^a -- Majors are encouraged to take PHSX 213 and 214, the Honors sections of 211 and 212.

^b -- See the list of courses allowed as General Education Component Electives. One course from each of the five areas, Economics, Ethics, Communication, Environmental Concern, and Contemporary Issues, is required.

^c -- 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 prerequisite courses that would need to be taken.