

# Engineering Physics Elective Options

## 10KP0121BS

In consultation with his/her adviser, each student will elect a set of technical or professional courses that address an intellectually coherent body of knowledge. A minimum of twelve (12) hours must be at the 200 level or higher, with the exception of CHEM 104/105. Required courses may not be included in the set. Students may select from a list of pre-approved options or design a custom option, subject to departmental approval. Physics courses used to satisfy the Flexible Physics Core (Lists A & B) may not also be used to satisfy the option requirements, with the exception of the Professional Option.

### Professional Physics

MATH 415	Linear Algebra	3
PHYS 326	Mechanics and Relativity II	3
PHYS 436	Electromagnetic Fields II	3
PHYS 427	Thermo & Statistical Physics	3
PHYS 487	Quantum Mechanics II	4
<i>choose 1 of the following:</i>		
PHYS 401	Classical Physics Lab	3
PHYS 403	Modern Experimental Physics	5
PHYS 404	Electronic Circuits	5
PHYS 402	Light	4
total = 20-22 hours		

### Astrophysics (can fulfill astronomy minor)

ASTR 210	General Astronomy	3
ASTR 350	Introduction to Cosmology	3
ASTR 404	Stellar Astrophysics	3
		<i>additional 300 or 400 level astronomy course</i>
<i>choose 2 of the following:</i>		
ASTR 405	Solar Sys and IS Medium	3
ASTR 406	Galaxies and the Universe	3
ASTR 414	Astronomical Techniques	4
total = 18-19 hours		

### Bioengineering

Fulfill one of the Bioengineering Minor options:  
<http://bioen.ece.uiuc.edu/undergraduate/eng-minor.html>

### Biophysics

CHEM 104/105	General Chemistry II & Lab II	3/1
or CHEM 204/205	Accelerated Chemistry II & Lab II	3/2
or CHEM 232/233	Elementary Organic Chemistry I and Lab I	3/2
or CHEM 236/237	Fundamental Organic Chem I and Structure and Synthesis	3/3
BIOP 401	Introduction to Biophysics	3
BIOP 420	Molecular Biophysics	3
<i>choose 1 of the following:</i>		
PHYS 427	Thermo & Statistical Mechanics	4
MCB 446	Physical Biochemistry (note prerequisites*)	3
BIOE 498	Special Topics	3
total = 18-21 hours		

\* CHEM 440, Physical Chemistry Principles, or 344, Physical Chemistry I;  
 MCB 350, Introductory Biochemistry, recommended

# Engineering Physics Elective Options continued 10KP0121BS

## Computational Physics

CS 125	Introduction to Computer Science (to replace CS 101)	4
CS 257	Numerical Methods	3
<b>or</b> CS 450	Intro to Numerical Analysis	3
CS 225	Data Structure & Softw Princ	3
<b>or</b> CS 400	Data Structure, Non-CS Majors	3
MATH 415	Linear Algebra	3
<i>choose 2 of the following</i>		
CS 455	Numerical Methods for PDEs	3
CS 458	Numerical Linear Algebra	3
CS 459	Numerical Approx and ODEs	3
CS 418	Computer Graphics	3
CS 420	Intro to Parallel Programming	3
MATH 461	Probability Theory I	3
MSE 482	Phys and Soc Sci Simulations	3
ATMS 502	Numerical Fluid Dynamics	4
MCB 417	Computational Neurobiol Method	4

total = 19-21 hours

(CS 125 doesn't count toward option, rather toward degree requirement.)

## Materials Science

CHEM 104/105	General Chemistry II/ Lab II	3/1
PHYS 427	Thermo and Statistical Mechanics	4
PHYS 460	Condensed Matter Physics	4
MSE 450	Intro to Polymer Sci and Eng	3
MSE 455	Polymer Physics	3
MSE 480	Surfaces and Colloids	3

total = 20 hrs

## Optical Physics

PHYS 436	Electromagnetic Fields II	3
PHYS 402	Light	4
ECE 455	Optical Electronics	3
ECE 460	Optical Imaging	3

## Physical Electronics

*choose a minimum of 12 credit hours from the following:*

PHYS 404	Electronic Circuits I	5
PHYS 405	Electronic Circuits II	5
PHYS 460	Condensed Matter Physics	4
ECE 110	Intro to Elec & Comp Eng	4
ECE 210	Analog Signal Processing	4
ECE 290	Computer Engineering, I	3
ECE 410	Digital Signal Processing, I	3
ECE 444	IC Device Theory & Fabrication	3
ECE 488	Compound Semicond & Devices	3

total = 12 hrs

5.22.04/III

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