

**BACHELOR OF SCIENCE IN PHYSICS WITH A BIOLOGY MINOR  
RECOMMENDED COURSE SEQUENCE - EFFECTIVE SPRING 2009**

<b>Year</b>	<b>Fall Semester</b>	<b>Spring Semester</b>	<b>Summer</b>	<b>Credits</b>
Freshman	PHYS 1100 Fun of Physics PHYS 2303 Contemporary Physics MATH 2417 Calculus 1** CHEM 1311 General Chemistry 1 CHEM 1111 Chemistry Laboratory 1 RHET 1302 Rhetoric RHET 1101 Oral Comm./Critical Thinking*	PHYS 2325 Mechanics* PHYS 2125 Mechanics Laboratory MATH 2419 Calculus 2** CHEM 1312 General Chemistry 2 CHEM 1112 Chemistry Lab 2 HUMA 1301 Exploration of the Humanities		Fall - 16 Spring - 15 Total Hrs - 31
Sophomore	PHYS 2326 Electromagnetism and Waves* PHYS 2126 Electromagnetism Laboratory MATH 2451 Multivariable Calculus CHEM 2323 Organic Chemistry I CHEM 2123 Organic Chemistry Lab I AP 1301 Exploration of the Arts GOVT 2301 Government 1	PHYS 3352 Modern Physics 1 PHYS 3311 Theoretical Physics MATH 2420 Ordinary Differential Equations MATH 2418 Linear Algebra CHEM 2325 Organic Chemistry II CHEM 2125 Organic Chemistry Lab II		Fall - 18 Spring - 18 Total Hrs - 67
Junior	PHYS 3330 Numerical Methods and Computational Techniques PHYS 3416 Electricity and Magnetism PHYS 3312 Classical Mechanics HIST 1301 Themes in American History BIOL 2311 Intro to Modern Biology I BIOL 2111 Intro to Modern Biology I Workshop	PHYS 4301 Quantum Mechanics 1 PHYS 4328 Optics PHYS 4311 Thermodynamics/Statistical Mechanics BIOL 3361 Biochemistry I BIOL 3161 Biochemistry Workshop I PHYS 4373 Physical Measurements Laboratory <sup>†</sup> or GOVT 2302 Government 2	PHYS 4373 Physical Measurements Laboratory <sup>†</sup>	Fall - 17 Spring - 16 Summer - 0 or 3 Total Hrs - 100/103
Senior	PHYS 4352 Modern Physics 2 BIOL 3380 Biochemistry Lab I <sup>††</sup> NATS 4310 Advanced Writing (or Thesis) <sup>***</sup> HIST 1302 Issues in American History BIOL 3301 Classical and Molecular Genetics BIOL 3101 Class. and Mole. Genetics Workshop GOVT 2302 Government 2 (if still needed)	PHYS 3325 Electronics PHYS 3125 Electronics Laboratory Social and Behavioral Sci. Elective 3 credit hours Physics (Upper Division) Electives - 6 credit hours Biology (Upper Division) Elective - 3 credit hours		Fall - 16/19 Spring - 16 Total Hrs - 135

Notes:

\*PHYS 2421 Honors Physics I is a recommended elective substitution for Phys 2325.

\*PHYS 2422 Honors Physics II is a recommended elective substitution for Phys 2326.

\*\*The MATH 2413, 2414, 2415 sequence may be electively substituted for MATH 2417 and MATH 2419. If this substitution is made, MATH 2415 is treated as a co-requirement for PHYS 2325, PHYS 2421 or PHYS 2327 in place of MATH 2419.

\*\*\*PHYS 4390 or PHYS 4399 may be substituted for NATS 4310 to satisfy the advanced writing requirement.

51 Hours of upper division courses (course numbers beginning with 3 or greater) are required for all degrees.

A Biology minor requires at least 12 upper-division credits: BIOL 3361/3161 and BIOL 3301/3101 plus two upper-division electives for Biology majors. BIOL 3380 is recommended for the first upper-division elective. A minor requires at least 18 total credits including lower-division courses that are satisfied by CHEM 2323/2123, CHEM 2325/2125, BIOL 2311/2111. Suggested upper-division Biology electives are BIOL 5430 Macromolecular Physical Chemistry, BIOL 3336 Protein and Nucleic Acid Structure, BIOL

3362 Biochemistry II, and BIOL 6V39/5V49 Biophotonics, however any upper-division Biology course for Biology majors may be used.

\*Research Experiences for Undergraduates (REUs) during the summer are highly recommended for Physics majors planning to continue their education in graduate school. Formal REU programs exist at many universities, national laboratories, and even overseas, and typically offer a stipend typical of a graduate teaching assistantship. Announcements for REU programs usually appear online in December and application deadlines usually range from late January to early March. Requirements vary, but students are often eligible if they have completed their freshman year. If you wish to do an REU during the summer following your junior year, please plan to complete PHYS 4373 Physical Measurements Laboratory during a different semester.

\*\*The BIOL 2281 pre-req. for BIOL 3380 will be waived for Physics B.S. students who have taken already taken BIOL 3361 Biochemistry I, or who are taking BIOL 3361 concurrently with BIOL 3380.