Physics - B.A.

The Department of Physics and Astronomy helps many students acquire a general understanding and appreciation of physics and astronomy. In the liberal arts tradition, the undergraduate curriculum is complete and flexible enough to allow a graduate with a major in physics to pursue a variety of careers.

120 hours (minimum)
Any student earning a Bachelor of Arts (BA) degree must complete a minimum of 39 hours at the 300+ level. These hours are generally completed by the major requirements. However, keep this hour requirement in mind as you choose your course work for the requirements in the major. A complete description of College requirements for the Bachelor of Arts degree can be found on page 109 of the 2009-2010 UK Bulletin.

University Studies Program Requirements
I. Math (completed by Premajor Requirement)
II. Foreign Language (placement exam recommended) ........... 0-8
III. Inference–Logic (completed by Premajor Requirement)
IV. Written Communication .................................................. 0-4
V. Natural Sciences (completed by Premajor Requirement)
VI. Social Sciences ................................................................. 6
VII. Humanities ........................................................................ 6
VIII. Cross-Cultural (choose a 300+ level PHI course) .............. 3
X. Electives (choose 300+ level Social Science courses) ........... 6

USP hours: ................................................................. 21-33

Graduation Writing Requirement
Students may satisfy the Graduation Writing Requirement by completing PHY 435.

Graduation Writing Requirement Hours: .............................. 3

College Requirements
I. Foreign Language (placement exam recommended) ........... 0-8
II. Disciplinary Requirements
   a. Natural Science (completed by Premajor Requirements)
   b. Social Science (completed by USP Elective Requirement)
   c. Humanities (completed by USP Cross-Cultural Requirement) .................................................. 3
III. Laboratory or Field Work (completed by Premajor Requirement)
IV. Electives .......................................................................... 6

College Requirement hours: .................................................. 9-17

Premajor Requirements
*PHY 231/232/241/242 General University Physics and Laboratory ... 10
   or with permission of the Director of Undergraduate Studies:
PHY 211/213 General Physics .................................................. (10)
PHY 228 Optics, Relativity and Thermal Physics ....................... 3
CHE 105 General College Chemistry I ................................. 3
CHE 107 General College Chemistry II ................................. 3
*MA 113 Calculus I .............................................................. 4
MA 114 Calculus II ............................................................... 4

Premajor hours: ................................................................. 27

Major Requirements
Main Core Requirements
PHY 306 Theoretical Methods of Physics ............................. 3
PHY 361 Principles of Modern Physics ................................. 3
PHY 404G Mechanics ......................................................... 3
PHY 416G Electricity and Magnetism ................................... 3
PHY 520 Introduction to Quantum Mechanics ..................... 3
MA 213 Calculus III ............................................................ 4
MA 214 Calculus IV ............................................................. 3

Major Core hours: ............................................................ 22

Other Course Work Required for the Major
Choose 3-6 hours at the 400+ level to include at least one of the following laboratory courses: PHY 402G, 422, 435, 535, 545 ......................... 3-6

From Outside the Major Department
Choose 14-17 hours outside Physics at the 300+ level. Courses are generally chosen from computer science, engineering, mathematics, philosophy, or statistics. 200+ level courses used to satisfy USP and College requirements can also be counted here .............................. 14-17

Other Major hours: ............................................................ 20

Total Minimum Hours Required for Degree .......................... 121
*Course used towards completion of a USP Requirement.

Suggested Curriculum for B.A. in Physics
As you plan your physics studies, please note that upper division physics courses, PHY 3XX and all higher numbered courses, are offered once per year in the semester indicated on the suggested curricula. For example, PHY 306 and PHY 361 are offered in the spring semester only. This suggested curriculum minimally meets the requirements for the B.A. in Physics.

Freshman Year

First Semester
PHY 231 General University Physics ..................................... 4
PHY 241 General University Physics Laboratory .................. 1
MA 113 Calculus I .............................................................. 4
ENG 104 Writing: An Accelerated Foundational Course ........ 4

Second Semester
PHY 228 Optics, Relativity and Thermal Physics ................. 3
MA 114 Calculus II ............................................................. 4
CHE 105 General College Chemistry I .............................. 3

Sophomore Year

First Semester
PHY 232 General University Physics ..................................... 4
PHY 242 General University Physics Laboratory .................. 1
*MA 213 Calculus III ............................................................ 4
CHE 107 General College Chemistry II .............................. 3
Foreign Language ............................................................... 4
<table>
<thead>
<tr>
<th>Semester</th>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td><strong>Second Semester</strong></td>
<td>PHY 306 Theoretical Methods of Physics</td>
<td>3</td>
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<tr>
<td></td>
<td>PHY 361 Principles of Modern Physics</td>
<td>3</td>
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<td>*MA 214 Calculus IV</td>
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<td></td>
<td>Foreign Language</td>
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<td><strong>Junior Year</strong></td>
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<td><strong>First Semester</strong></td>
<td>*CS 115 Introduction to Computer Programming</td>
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<td></td>
<td>PHY 404G Mechanics</td>
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<td></td>
<td>PHY 335 Data Analysis for Physicists</td>
<td>1</td>
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<td>*MA 322 Matrix Algebra and Its Applications</td>
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<td>**Humanities</td>
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<td>Foreign Language</td>
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<tr>
<td><strong>Second Semester</strong></td>
<td>MA 432G Methods of Applied Mathematics I</td>
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<td>PHY 520 Introduction to Quantum Mechanics</td>
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<td>**Social Science</td>
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<td>**Humanities</td>
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<td><strong>Senior Year</strong></td>
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<td><strong>First Semester</strong></td>
<td>PHY 416G Electricity and Magnetism</td>
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<td>PHY 554 Fundamentals of Atomic Physics</td>
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<td></td>
<td>**Social Science</td>
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<td></td>
<td>*Elective</td>
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<tr>
<td><strong>Second Semester</strong></td>
<td>MA 432G Methods of Applied Mathematics II</td>
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<td>PHY 435 Intermediate Physics Laboratory</td>
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<td></td>
<td>Foreign Language (if needed)</td>
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<td>University Studies (if needed)</td>
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<td>Elective</td>
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* A total of 14 credit hours in math, computer science, chemistry, engineering or other areas related to physics but outside the department must be completed to satisfy the college requirement. A total of 42 hours in physics and related areas must be taken to satisfy the major requirement.

**The Bachelor of Arts requires the completion of six additional hours in humanities and social sciences beyond those required for University Studies. It also requires the completion of 39 hours at or above the 300 level.