To be adopted:

Proposed Changes to Physics Lower Division Major Requirements

PRESENT:

University Requirements
See Undergraduate Studies section.

College Requirements
See College of Natural and Agricultural Sciences, Colleges and Programs section.

Some of the following requirements for the major may also fulfill some of the college’s breadth requirements. Consult with a department advisor for course planning.

Major Requirements
The major requirements consist of a core curriculum and additional requirements for various B.S. degrees. The core requirements for the B.A. and B.S. degrees in Physics are as follows:

1. Lower-division requirements (69 units)
   a) one of the following sequences: PHYS 041A, PHYS 041B, PHYS 041C, or PHYS 040A, PHYS 040B, PHYS 040C, PHYS 040D, PHYS 040E. The first sequence is preferred for the B.S. in Physics.
   b) PHYS 39
   c) MATH 008B or MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046
   d) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC
   e) CS 010

PROPOSED:

University Requirements
See Undergraduate Studies section.

College Requirements
See College of Natural and Agricultural Sciences, Colleges and Programs section.

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   b) PHYS 39
   c) MATH 008B or MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046
   d) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC
   e) CS 010 or CS 010V. A higher-level CS course may satisfy the CS10 requirement with approval.
2. Upper-division requirements (46 units)
   a) PHYS 130A, PHYS 130B, PHYS 132, PHYS 135A, PHYS 135B, PHYS 156A, PHYS 156B
   b) PHYS 139L (5 units), PHYS 142L (5 units).
   c) 8 units of upper division Physics electives. Upper division math, science of engineering may be substituted with approval. A student may take up to a maximum of 4 units of undergraduate research (PHYS 195A, PHYS 195B, PHYS 195C, and/or PHYS 195D). This may include a Physics internship at an approved government or industrial laboratory, with approval.

Physics: Standard Track (B.S. degree)
1. Additional upper-division requirements (21 units)
   a) PHYS 133, PHYS 136
   b) PHYS 142L (additional 5 units - 1 quarter). Approved undergraduate research (PHYS 195A, PHYS 195B, PHYS 195C, PHYS 195D) in physics or an internship (PHYS 198-I) in physics at a government or industrial laboratory can be used in place of up to 5 units of PHYS 142L.
   c) 8 additional units of upper division Physics electives. PHYS 156C is highly recommended for those planning to go to graduate school in physics.

Physics: Biophysics Track (B.S. degree)
1. Additional lower-division requirements (12 units)
   a) BIOL 005A, BIOL 005B, BIOL 005C, BIOL 05LA
2. Additional upper-division requirements (24 units)
   a) CHEM 112A, CHEM 112B which may be used to satisfy the core requirement 2c.
   b) 16 additional upper division units taken from CHEM 112C, BCH 110A, BCH 110B, BCH 110C or BIOL 107A (other upper division CHEM/BIOL/BCH may be
Physics Education Track (B.S. degree only)

1. Additional lower-division requirements (10 units)
   a) EDUC 003, EDUC 004
   b) LING 020 or LING 021

2. Additional upper-division requirements (16 units)
   a) EDUC 110, EDUC 177A, and either EDUC 172 or EDUC 174.

3. Upper division recommendations (4 units)
   a) EDUC 104/MATH 104

Physics: Applied Physics and Engineering Track (B.S degree)

1. Additional upper-division requirements (21 units)
   a) PHYS 142L (additional 5 units- 1 quarter).
      Approved undergraduate research (PHYS 195A, PHYS 195B, PHYS 195C, PHYS 195D) in physics or an internship (PHYS 198-I) in physics at a government or industrial laboratory can be used in place of up to 5 units of PHYS 142L.
   b) 8 additional units of upper division Physics electives.
   c) 8 units of upper division Engineering electives.

Students seeking an emphasis in environmental physics or chemical physics should consult with an advisor. The physics electives may be selected on an individual basis to stress one of these concentrations.

Students continuing on to graduate school are encouraged to take additional upper-division courses in Mathematics, such as MATH 146A, MATH 146B, MATH 146C, MATH 165A, MATH 165B, and MATH 113.

(substituted upon approval)
Students may wish to earn a Minor in Mathematics which requires an additional 24 units of upper division math.

To graduate, a minimum grade point average of 2.00 (C) is necessary overall and in the upper-division courses taken for the major (courses listed under 2.).

**Bachelor of Arts**

For the B.A. degree, additional units are required in Humanities, Social Sciences, and foreign language to meet the breadth requirements.

**Justification:**

CS 010 is a highly impacted class and very difficult to enroll in time. CS 010V is the online version of CS 010 and considered equivalent by the CS department.

**Approvals:**

Approved by the faculty of the Department of Physics: 1/24/2014

Approved by the faculty of the College of Natural and Agricultural Sciences: 1/24/2014

Approved by the Executive Committee of the College of Natural and Agricultural Sciences: 2/18/2014

Approved by the Committee on Educational Policy: 4/22/2014