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October 14, 2014

**CHRIS CLEMENS**  
*Department Chair*

Dr. James Thompson,  
Associate Dean for Undergraduate Curricula  
Office of Undergraduate Education  
3018 Steele Building, Campus Box 3504  
University of North Carolina at Chapel Hill  
Chapel Hill, NC 27599-3504

Dear Professor Thompson,

Last year, the Department of Physics and Astronomy underwent a major revision of its undergraduate curriculum, including changes to our introductory sequence (from PHYS 116/117 to 118/119), consolidating course contents, and adding new electives. Overall, this led to a reduction of the course requirements for our Standard and Astrophysics option by two courses, therefore giving students the opportunity to start a BS in Physics in their third semester.

With this letter we are submitting updates to the BS requirements for the Standard and Astrophysics option. The updates are summarized below, and a full list can be found below the signatures. The new courses and course revisions have been submitted via CRAS.

A summary of these changes, which apply to both our Standard Option and our Astrophysics Option, is as follows:

1. We are adding a course "Physical Modeling" (PHYS 358), to be taken in the 5th semester as a follow-up to our numerical methods course PHYS 331. With this step, we are implementing a recommendation made by the External Review Committee's report in 2012, emphasizing the need for more computational and numerical work. The course introduces students to modeling approaches by highlighting specific problems drawn from the introductory and advanced physics and astronomy courses. PHYS 358 will be a required course for the Standard and Astrophysics option. To keep the number of courses the same, we reduced the number of electives for both options by one.
2. We are adding two senior honors thesis courses (PHYS 691H, 692H), to achieve consistency with the University's policies regarding honors theses.

3. We are adding an experimental education designation to PHYS 295 (Research with Faculty Mentor I), and to ASTR 502 (Astrophysics II). PHYS 295 requires a learning contract and is the first opportunity students encounter for directed research. ASTR 502 is an advanced undergraduate class focusing on research in the form of class projects.
4. The courses PHYS 301, 312 and 341 were renumbered 401, 412 and 441, to accommodate the Department's implementation of custom study plans for first-year graduate students. The custom study plans allow graduate students with missing course work to take one or more of the above 400-level undergraduate courses while remaining in good standing with the graduate school.

All of our undergraduate advisors are aware of these changes. Current students will be advised that they may follow the new requirements, but that they are not required to.

Thank you for working with us on our submission.

Sincerely,



Dr. J. Christopher Clemens  
Professor and Chair  
Department of Physics and Astronomy  
University of North Carolina at Chapel Hill



Dr. Fabian Heitsch  
Assistant Professor  
Department of Physics and Astronomy  
University of North Carolina at Chapel Hill

Here is the text that we want to appear in the undergraduate bulletin (new courses pending approval have been marked with an asterisk, changes have been marked with red):

## **Majoring in Physics and Astronomy: Bachelor of Science**

### **B.S. Major in Physics and Astronomy: Standard Option**

#### **Core Requirements**

- PHYS 281L, 311, 321, 331, 351, 358\*, 401, 412, 441, 481L, and 521
- PHYS 395 or 692H\* (optional for UNC–BEST students)
- Two additional courses chosen from ASTR (numbered above 300); ENGL 303; MATH 528, 529; PHYS 231 and any PHYS course numbered above 300

#### **Additional Requirements**

- CHEM 101/101L and 102/102L
- MATH 231, 232, 233, and 383
- PHYS 118 and 119

### **B.S. Major in Physics and Astronomy: Astrophysics Option**

#### **Core Requirements**

- ASTR 519
- PHYS 281L, 311, 321, 331 (with project on an astrophysics topic), 351, 358\*, 401, 412, 441 and 521
- PHYS 395 or 692H\* (optional for UNC-BEST students)
- One additional course chosen from ASTR (numbered above 300)
- One additional course chosen from ASTR (numbered above 300); ENGL 303; MATH 528, 529; PHYS 231

#### **Additional Requirements**

- ASTR 102 and 301
- CHEM 101/101L (CHEM 102/102L are recommended but not required)
- MATH 231, 232, 233, and 383
- PHYS 118 and 119

As part of these course requirements, candidates for the B.S. degree must earn grades of C (not C-) or better in at least 18 credit hours of courses that are listed under Core Requirements.

It is strongly recommended that students planning to major in physics fulfill the Foundations requirement in English composition and rhetoric by enrolling in ENGL 105I Writing in the Natural Sciences.

Most students will find it advantageous to defer some of the General Education requirements to the junior and/or senior year(s).

Here is the text that currently appears in the bulletin, for reference:

## **Majoring in Physics and Astronomy: Bachelor of Science**

### **B.S. Major in Physics and Astronomy: Standard Option**

#### **Core Requirements**

- PHYS 281L, 301, 311, 312, 321, 331, 341, 351, 395 (optional for UNC–BEST students), 481L, and 521
- Three additional courses chosen from ASTR (numbered above 300); ENGL 303; MATH 528, 529; PHYS 231 and any PHYS course numbered above 300

#### **Additional Requirements**

- CHEM 101/101L and 102/102L
- MATH 231, 232, 233, and 383
- PHYS 118 and 119

## **B.S. Major in Physics and Astronomy: Astrophysics Option**

### **Core Requirements**

- ASTR 519
- PHYS 281L, 301, 311, 312, 321, 331 (with project on an astrophysics topic), 341, 351, 395, and 521
- Two additional courses chosen from ASTR (numbered above 300); ENGL 303; PHYS 231
- One additional course chosen from ASTR (numbered above 300); ENGL 303; MATH 528, 529; PHYS 231 or any PHYS course numbered above 300

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As part of these course requirements, candidates for the B.S. degree must earn grades of C (not C-) or better in at least 18 credit hours of courses that are listed under Core Requirements.

It is strongly recommended that students planning to major in physics fulfill the Foundations requirement in English composition and rhetoric by enrolling in ENGL 105I Writing in the Natural Sciences.

Most students will find it advantageous to defer some of the General Education requirements to the junior and/or senior year(s).