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Recent prerequisite changes by the Physics Department have added eight credit hours to the course load of astronomy majors. The Astronomy Department is concerned about this additional burden on our majors and seeks to remove one required course (Physics 664; four credit hours). In addition, based on a study of retention and time to graduate, we propose to add two credits of undergraduate seminar (Astronomy 295) as a requirement of the astronomy major. This recently-approved course is primarily intended for first-year students and aims to improve retention, time to graduate, and inform students about contemporary research. Below is the detailed rationale for these changes. The net result of this proposal would be a two credit hour decrease in the astronomy major program. We note that combined with the (already approved) changes in Physics, there will be a six credit hour increase in the astronomy major relative to two years ago. If this proposal is not approved, the net increase is eight hours. The detailed rationale for these changes is as follows:

### **1. Removal of Physics 664 (Theoretical Mechanics)**

Last year the Physics Department added Physics 416 (Methods of Experimental Physics) as a prerequisite for Physics 555 (Fields and Waves I), 621 (Statistical Physics I), and 631 (Quantum Physics I) for students who first enroll in Autumn 2008 or afterwards. CSE 202 (Intro to C++ Programming) was made a prerequisite for Physics 416 at the same time. Physics 555, 621, and 631 are required for the astronomy major, while Physics 416 and CSE 202 were not, so this adds eight credit hours (four per course) to the astronomy major. The motivation for this change is that the Physics Department plans to incorporate more programming into their curriculum. While the Astronomy Department is enthusiastic about the additional programming skills that students will gain from these new prerequisites, and we presently plan to incorporate more programming into our upper level courses as well, we are also concerned that the addition of eight credit hours will overburden our majors and specifically impact their time to graduation. We therefore propose to remove Physics 664 (Theoretical Mechanics, four credit hours) as a requirement. We note that this change will only impact the astronomy majors who do not have a double major with physics, which is approximately half of the astronomy majors. While Physics 664 contains important knowledge, the affected students are generally not those on our "graduate school track" (we strongly encourage students interested in

graduate study to double major with physics). We would continue to recommend Physics 664 to students who only major in astronomy.

## **2. Addition of Astronomy 295 (Undergraduate Seminar)**

We propose to add two instances of Astronomy 295 (Undergraduate Seminar), a one credit hour survey course with no prerequisites and graded pass/fail, as requirements of the astronomy major. This survey course was developed to improve retention, stimulate interest in research, and improve the typical time to graduation. The course is intended for first-year astronomy majors. The content of the course is largely an overview of contemporary astronomy research, although the first several weeks are devoted to the recommended major curriculum, careers options, and undergraduate research opportunities. At present students are strongly encouraged to take this course during their first year (offered Autumn and Winter Quarters), which maximizes the positive impact on their four-year course schedule and also provides them with a palpable link to the Astronomy Department faculty (otherwise astronomy majors do not normally take their first astronomy courses until at least the second year). The addition of this course as a requirement should therefore improve our retention as well. Because Astronomy 295 is only one credit hour per quarter and is primarily informational, we do not expect (and have not observed) any impact on the number of courses students take concurrently and therefore expect no impact on time to graduate. In fact we expect a net positive impact due to the emphasis on development of a detailed, four-year course plan during the first year.

The net impact of these two proposed changes is the reduction of two credit hours. Four credit hours are removed with the proposed elimination of the Physics 664 requirement, while two credit hours are added with the proposed addition of two instances of Astronomy 295. In the larger context of the changes in physics requirements last year, an astronomy major is presently required to take eight more credit hours than one entering the University two years ago. This proposal will decrease this to six hours, two of which are primarily informational and graded pass/fail.

Please contact me with any questions about these proposed changes.

Sincerely,

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