

TO: College of Arts and Sciences Curriculum Committee

FROM: Lyle Ford, Interim Chair
Department of Physics and Astronomy

DATE: October 5, 2020

RE: Program Change

We request implementation of the following program change with the next possible *Catalog*.

Names of Programs: Physics, Dual Degree Engineering Emphasis, Major

Program Codes: 230-206

Date of Department/Program Approval: September 24, 2020

From Current Catalog Web Pages: <https://catalog.uwec.edu/undergraduate/arts-sciences/physics-astronomy/physics-major-dual-degree-ba-bs/>

To: Required courses not counted toward credits in major:

MATH 312 Differential Equations and Linear Algebra

PHYS 240 Computational Physics¹

or CS 145 Programming for New Programmers²

or CS 163 Introduction to Programming in C++²

or CS 170 Computing for the Sciences and Mathematics²

or advisor-approved course appropriate for the engineering program

Complete an engineering degree³

¹Many upper division physics courses require proficiency in Python so PHYS 240 is preferred.

²If CS 145, CS 163 or CS 170 is taken, Python proficiency will be required prior to enrollment in relevant upper division physics courses. Contact the department to complete the required programming exercise.

³ To receive the UW-Eau Claire Dual Degree Engineering Emphasis physics degree, the student must complete an engineering degree from one of the above schools. Students will typically complete most of the UW-Eau Claire Liberal

Education Core and Dual Degree physics requirements while at UW-Eau Claire before transferring to the engineering school. Students must complete 84 semester credits before transferring to the engineering school, 56 of which must be taken in residency at UW-Eau Claire, with a minimum of 12 upper-division credits of physics and a minimum of six credits of mathematics taken at UW-Eau Claire.

Why: A number of upper division physics courses incorporate exercises that can only be solved using computational approaches. Physics majors are required to take a computer science course (currently CS 163 or CS 170) but some wait until after they take the upper division courses for which programming skills are useful. The department is adding a computer programming prerequisite to these courses and creating a new course in computational physics (PHYS 240) to better meet the needs of the upper division courses. The department has chosen Python as the preferred language for the upper division courses to ensure skills honed in one course can be more easily transferred to others. Python will be taught in PHYS 240. Students who have learned a different language in CS 145, CS 163, or CS 170 will not be required to take PHYS 240 to learn Python but will have to show proficiency in the language to satisfy the prerequisite for the upper division courses. The department will develop a programming exercise that will allow students who choose this alternate path to show they can perform the programming tasks needed for the upper division courses.