

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Biological Physics major as a means to stimulate an undergraduate physics program HERBERT JAEGER, KHALID EID, JAN YARRISON-RICE, Miami University — In an effort to stress the cross-disciplinary nature of modern physics we added a Biological Physics major. Drawing from coursework in physics, biology, chemistry, mathematics, and related disciplines, it combines a broad curriculum with physical and mathematical rigor in preparation for careers in biophysics, medical physics, and biomedical engineering. Biological Physics offers a new path of studies to a large pool of life science students. We hope to grow our physics majors from 70-80 to more than 100 students and boost our graduation rate from the mid-teens to the mid-twenties. The new major brought about a revision of our sophomore curriculum to make room for modern topics without sidelining fundamentals. As a result, we split our 1-semester long Contemporary Physics course (4 cr hrs) into a year-long sequence Contemporary Physics Foundations and Contemporary Physics Frontiers (both 3 cr hrs). Foundations starts with relativity, then focuses on 4 quantum mechanics topics: wells, spin 1/2, oscillators, and hydrogen. Throughout the course applications are woven in whenever the opportunity arises, e.g. magnetism and NMR with spin 1/2. The following semester Frontiers explores scientific principles and technological advances that make quantum science and resulting technologies different from the large scale. Frontiers covers enabling techniques from atomic, molecular, condensed matter, and particle physics, as well as advances in nanotechnology, quantum optics, and biophysics.

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Date submitted: 09 Nov 2012

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