LSC Use Only No:	LSC Action-Date:	UWUCC USE Only No.	UWUCC Action-Date:	Senate Action Date:
R-10/6/11	App-10/7/11	11-33a	AP-10/25/11	App-11/08/11

Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee

Contact Person	Email Address
Stanley Sobolewski / Devki Talwar	sobolews@iup.edu
Proposing Department/Unit: Physics	Phone: 724 357 2370 or 724 357 4590

Check all appropriate lines and complete information as requested. Use a separate cover sheet for each course proposal and for each program proposal.

1. Course Proposals (check all that apply)

☐ New Course ☐ Course Prefix Change ☐ Course Deletion
☐ Course Revision ☐ Course Number and/or Title Change ☐ Catalog Description Change

Current Course prefix, number and full title	*Proposed course prefix, number and full title, if changing*

2. Additional Course Designations: check if appropriate

☐ This course is also proposed as a Liberal Studies Course.
☐ This course is also proposed as an Honors College Course.
☐ Other: (e.g., Women's Studies, Pan-African)

3. Program Proposals

☐ New Degree Program ☐ Catalog Description Change ☐ Program Revision
☐ New Minor Program ☑ New Track ☐ Other
☐ Program Title Change

Current program name	*Proposed program name, if changing*
	Bachelor of Science - Physics/Applied Physics Track

4. Approvals		**Date**
Department Curriculum Committee Chair(s)		9/7/2011
Department Chair(s)		9/7/2011
College Curriculum Committee Chair		9/22/11
College Dean		9/22/11
Director of Liberal Studies *		10/17/11
Director of Honors College *		
Provost *		9/23/11
Additional signatures as appropriate: (include title)		
UWUCC Co-Chairs	Gail S Sechrist	11/8/11

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Received
OCT 13 2011
Liberal Studies

Received
SEP 22 2011
Liberal Studies

Part I. Curriculum Proposal Cover Sheet (see above)

Part II. Description of Curriculum Change

1. Catalog description

Bachelor of Science –Physics/Applied Physics

Liberal Studies: As outlined in Liberal Studies section with the following specifications: **Mathematics:** MATH 125 **Natural Science:** PHYS 131-141 and 132-142 **Liberal Studies Electives:** 3cr, MATH 126, no courses with PHYS prefix		44
Major:		
Required Core Courses:		28
PHYS 131 Physics I-C Lecture	*cr (1)	
PHYS 132 Physics II-C Lecture	*cr (1)	
PHYS 141 Physics I-C Lab	*cr (1)	
PHYS 142 Physics II-C Lab	*cr (1)	
PHYS 331 Modern Physics	3cr	
PHYS 345 Optics	3cr	
PHYS 441 Classical Mechanics	3cr	
PHYS 451 Electricity and Magnetism	3cr	
Additional Required Courses		
PHYS 231 Electronics	4cr	
PHYS 342 Thermal and Statistical Physics	3cr	
PHYS 355 Computer Interfacing	3cr	
PHYS 350 Intermediate Experimental Physics I	3cr	
PHYS 475 Physics of Semiconductor Devices I	3cr	
Controlled Electives: select one of the following subfields:		19-21
Solid State Electronics: COSC 300, MATH 342, PHYS 323, 342, 353, 432, 475	21 cr	
Computer Science: COSC 300, 410, 450, MATH 171, PHYS 342, 353, 432	21 cr	
Chemistry: CHEM 231, 323, 341, 342, 343, MATH 225	19 cr	
Biology: BIOL 111, 112, CHEM 231, 351; one from the following: BIOL 250, 263, 401	19 cr	
Geo-Science GEOS 201, 202, 203, 341, 342, 371	21 cr	
Other Requirements:		17-23
CHEM 111 General Chemistry I	4cr	
CHEM 112 General Chemistry II	4cr	
COSC 110 Problem Solving & Structural Programming (2)	3cr	
COSC 250 Introduction to Numerical Methods	3cr	
MATH 241 Differential Equations	3cr	
Foreign Language Intermediate Level (2)	0-6cr	
Free Elective:		4-12
Total Degree Requirements: (1) Credits are counted in the Liberal Studies Natural Science requirement. (2) 6cr of computer programming will substitute for the foreign language requirement: COSC 110, COSC 210 or higher-level computer science courses (COSC 250 recommended), with department permission.		120

2. Detailed Description of the Bachelor of Science – Physics/ Applied Physics Track

Rational and Justification for the Physics/ Applied Physics Track

From the Physics department's internal analysis, brought about by the five-year review, we have decided to consolidate our degree offerings. The Applied Physics Degree is being moved from a stand-alone degree to a track in the Bachelors of Science – Physics program.. What had been previously separate "tracks" in the Applied Physics degree program are now referred to as a "sub field." This has precedence in other programs, such as Asian Studies, where the term "substantial focus" is used for areas of study in particular tracks. The department is also restructuring other degrees, so the change in this program is brought about by changes in other physics programs. This new track will have no effect on the liberal study components

Part III. Implementation - Provide answers to the following questions:

1. How will the proposed revision affect students already in the existing program?

Students in current B.S. Applied Physics Degree program will be able to transfer to the new B.S. Physics / Applied Physics Track without any difficulty.

2. Are faculty resources adequate? If you are not requesting or have not been authorized to hire additional faculty, demonstrate how this course will fit into the schedule(s) of current faculty.

While it is anticipated that the enrollment in upper level class will increase, the number will not increase past the occupancy limit of classrooms in Weyandt Hall. There will be no additional need for added sections, and therefore no additional faculty resources will be required.

3. Are other resources adequate? (Space, equipment, supplies, travel funds)

Most classrooms where physics courses are taught can hold 30 to 50 students; currently there are about 20 per class so space is adequate. Equipment and supplies are only an issue in one class, PHYS 350.. Up to this point in time the class maximum has been 16, so there is still room for expansion in that class. If students worked in groups of three rather than two, the maximum enrollment would be 24. Travel funds are not required.

4. Do you expect an increase or decrease in the number of students as a result of these revisions? If so, how will the department adjust?

The total number of students in the BS Physics program would remain unchanged following this rearrangement - the students in the separately listed programs (now deleted) would transfer into the new tracks.

Part IV. Periodic Assessment

1. The department evaluates both students currently in the program as well as graduates. Current students are assessed at the beginning and at the end of the program. During the first week of the first physics course, (PHYS 131) all students must take the Force Concept Inventory (FCI), a nationally recognized assessment on physics thinking. The test distinguishes between Aristotelian thinkers and Newtonian thinkers. Students below a certain score are required to talk to their advisor during the second week of class. During this advisement meeting, the advisor will ask about the student's background, performance in other courses and will advise the student to seek extra help, especially in the physics departments tutoring center. Advisers will carefully monitor the progress of students in this category. At the end of the same semester, students will again take the FCI and the improvement of the class as a whole as well as the target individuals will be examined. If over a few semesters, a sufficient number of students do not show a

significant gain in their scores, the department will consider a modification of the introductory course sequence. The second assessment is given to students and their eighth semester. This assessment is a collection of physics problems from the various topics in physics that the students must solve. While there is no target score, this assessment identifies the areas where our students might perform better. The result of this program evaluation has resulted in the development of the new course PHYS 401, which shows the students connection between various topics in physics. These two assessments have a yearly cycle, the first in the fall and the second in the spring.

The department also surveys graduates. We asked them what their current position is, the usefulness of different courses, and ways to change the program for the better. While we are happy to learn that most of our graduates are successful in their field, up and have positive things to say about our program, there has not been a major change because of this assessment.

Students enrolled in the physics education program also take the ETS administered PRAXIS II test. When this assessment was first required, some of our students did not achieve a satisfactory score. Over the years we have changed are advising policy to include meetings with the Physics education majors twice per month. Since we have invoked this policy, all of our Physics education majors have passed the PRAXIS II test on the first attempt.

Part V. Course Proposals

No new courses are being proposed

Part VI. Letters of Support or Acknowledgement

NA