

## Curriculum Proposal Cover Sheet

LSC Use Only Proposal No:  
LSC Action-Date:

UWUCC Use Only Proposal No: 12-119a  
UWUCC Action-Date: App-4/16/13 Senate Action Date: App-4/30/13

### Curriculum Proposal Cover Sheet - University-Wide Undergraduate Curriculum Committee

Contact Person(s) Andy Zhou	Email Address fzhou@iup.edu
Proposing Department/Unit Physics	Phone 724-357-4593

Check all appropriate lines and complete all information. Use a separate cover sheet for each course proposal and/or 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. Liberal Studies Course Designations, as appropriate**

This course is also proposed as a Liberal Studies Course (please mark the appropriate categories below)

Learning Skills     Knowledge Area     Global and Multicultural Awareness     Writing Intensive (include W cover sheet)  
 Liberal Studies Elective (please mark the designation(s) that applies – must meet at least one)

Global Citizenship     Information Literacy     Oral Communication  
 Quantitative Reasoning     Scientific Literacy     Technological Literacy

**3. Other Designations, as appropriate**


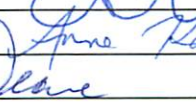
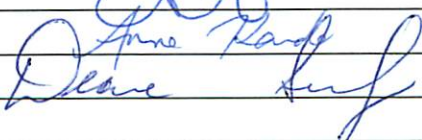
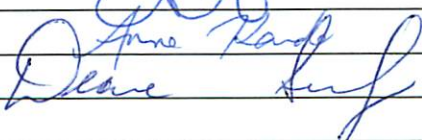
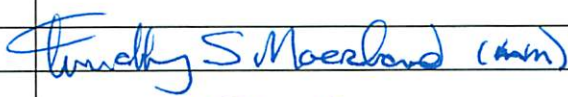

Honors College Course     Other: (e.g. Women's Studies, Pan African)

**4. Program Proposals**

Catalog Description Change     Program Revision     Program Title Change     New Track  
 New Degree Program     New Minor Program     Liberal Studies Requirement Changes     Other

Current program name: Bachelor of Science in Physics /Electro Optics Track

Proposed program name, if changing: \_\_\_\_\_

5. Approvals	Signature	Date
Department Curriculum Committee Chair(s)		4/2/13
Department Chairperson(s)		4/2/13
College Curriculum Committee Chair		4/2/13
College Dean		4/3/13
Director of Liberal Studies (as needed)		
Director of Honors College (as needed)		
Provost (as needed)		4/10/13
Additional signature (with title) as appropriate		
UWUCC Co-Chairs		4/16/13

Received

Received

B.S. Physics/ Electro-Optics Track

APR 17 2013

APR 4 2013

Liberal Studies Liberal Studies

**Part I. Curriculum Proposal Cover Sheet (see above)**

**Part II. Description of curriculum change**

**Proposed Description**

The B.S.in Physics/ Electro-Optics track is a practical degree where the graduates will be trained to work in the Electro-Optics Industry. Electro-Optics concerns itself with the interaction between optical and electronic states of materials.

**Bachelor of Science–Physics/Electro Optics Track**

**Liberal Studies:** As outlined in Liberal Studies section with the following specifications: 44

**Mathematics:** MATH 125

**Natural Science:** PHYS 131-141 and 132-142

**Liberal Studies Electives:** 3cr, MATH 126, no courses with PHYS prefix

**Major:** 38

**Required Core Courses:**

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 for Track:**

EOPT 105 Computer Interfacing in Electro-Optics	3cr
EOPT 130 Introduction to Optics	4cr
EOPT 125 Electronics for Electro-Optics	4cr
EOPT 150 Fundamentals of Photonics and Laser Safety	3cr
EOPT 210 Detection and Measurement	3cr
EOPT 220 Introduction to Lasers	3cr
EOPT 240 Fiber Optics	3cr
PHYS 350 Intermediate Experimental Physics I	3cr

**Other Non-Major Science Requirements:**

CHEM 111 General Chemistry I or CHEM 113 Adv. Gen. Chemistry I	4cr	20-26
CHEM 112 General Chemistry II or CHEM 114 Adv. Gen. Chemistry II	4cr	
COSC 110 Problem Solving and Structured Programming	3cr	
COSC 210 Object-Oriented and GUI Programming <i>or</i>	3cr	
COSC 250 Introduction to Numerical Methods	3cr	
MATH 225 Calculus III	3cr	
MATH 241 Differential Equations	3cr	
Foreign Language Intermediate Level (2)	0-6cr	

**Free Electives:**

**Total Degree requirements:** 12-18

120

- (1) Credits are counted in the Liberal Studies Natural Science requirement.
- (2) Six credits of computer programming will substitute for the foreign language requirement: COSC 110, 210, or higher-level Computer Science courses (COSC 250 recommended), with department permission.

**2. Summary of Changes**

The 10 changes are summarized below.

1	Deleted Courses	EOPT 110, EOPT 120 and EOPT 126 are deleted
2	Additional Required Courses	EOPT 130 is added as a new course

3		EOPT 210 and EOPT 220 are listed as the required courses
4		PHYS 355 Computer Interfacing as an option to EOPT 105
5	Course revision since program initiation	EOPT 150 Fundamentals of Light and Lasers 3cr is changed to EOPT 150 Fundamentals of Photonics and Laser Safety 3cr
6	Other Requirements	The total credit of 17-23 are changed to 20-26
7		COSC 210 Object-Oriented and GUI Programming (3cr) is added as an option to COSC 250 Introduction to Numerical Methods (3cr)
8		MATH 225 (3cr) is added
9	Free Electives	The total credit is changed from 16-22 to 12-18
10	Notes	Notes (2)&(3) are deleted. The Note (4) is kept but renumbered as (2)

a. Table comparing current and proposed programs.

Bachelor of Science–Physics/Electro Optics Track			
Current Program		Proposed Program	
<b>Liberal Studies:</b> As outlined in Liberal Studies section with the following specifications: <b>Mathematics:</b> MATH 125 <b>Natural Science:</b> PHYS 131-141 and 132-142 <b>Liberal Studies Electives:</b> 3cr, MATH 126, no courses with PHYS prefix <b>Major:</b> <b>Required Core Courses:</b>	44	<b>Liberal Studies:</b> As outlined in Liberal Studies section with the following specifications: <b>Mathematics:</b> MATH 125 <b>Natural Science:</b> PHYS 131-141 and 132-142 <b>Liberal Studies Electives:</b> 3cr, MATH 126, no courses with PHYS prefix <b>Major:</b> <b>Required Core Courses:</b>	44
PHYS 131 Physics I-C Lecture (1, 2)	3cr	PHYS 131 Physics I-C Lecture (1)	cr*
PHYS 132 Physics II-C Lecture (1, 2)	3cr	PHYS 132 Physics II-C Lecture(1)	cr*
PHYS 141 Physics I-C Lab (1)	1cr	PHYS 141 Physics I-C Lab(1)	cr*
PHYS 142 Physics II-C Lab (1)	1cr	PHYS 142 Physics II-C Lab(1)	cr*
PHYS 331 Modern Physics	3cr	PHYS 331 Modern Physics	3cr
PHYS 345 Optics	3cr	PHYS 345 Optics	3cr
PHYS 441 Classical Mechanics	3cr	PHYS 441 Classical Mechanics	3cr
PHYS 451 Electricity and Magnetism	3cr	PHYS 451 Electricity and Magnetism	3cr
<b>Additional Required Courses: (3)</b>		<b>Additional Required Courses:</b>	
EOPT 105 Computer Interfacing in Electro-Optics	3cr	EOPT 105 Computer Interfacing in Electro-Optics r or	3cr
EOPT 110 Geometric Optics	3cr	PHYS 355 Computer Interfacing	
EOPT 120 Wave Optics	3cr	EOPT 130 Introduction to Optics	4cr
EPOT 125 Introduction to Electronics	4cr	EOPT 125 Electronics for Electro-Optics	4cr
EOPT 126 Electronics II for Electro-Optics	3cr	EOPT 150 Fundamentals of Photonics and Laser Safety	3cr
EOPT 150 Fundamentals of Light and Lasers	3cr	EOPT 210 Detection and Measurement	3cr
EOPT 240 Fiber Optics	3cr	EOPT 220 Introduction to Lasers	3cr
PHYS 350 Intermediate Experimental Physics I	3cr	EOPT 240 Fiber Optics	3cr
		PHYS 350 Intermediate Experimental Physics I	3cr
<b>Other Requirements:</b>	17-23	<b>Other Non-Major Science Requirements:</b>	20-26
CHEM 111 General Chemistry I	4cr	CHEM 111 General Chemistry I or	4cr
CHEM 112 General Chemistry II	4cr	CHEM 113 Adv. Gen. Chemistry I	
COSC 110 Problem Solving and Structured Programming	3cr	CHEM 112 General Chemistry II or	4cr
		CHEM 114 Adv. Gen. Chemistry II	
COSC 250 Introduction to Numerical Methods	3cr	COSC 110 Problem Solving and Structured Programming	3cr
		COSC 210 Object-Oriented and GUI Programming <i>or</i>	3cr
MATH 241 Differential Equations	3cr	COSC 250 Introduction to Numerical Methods	
Foreign Language Intermediate Level (4)	0-6cr	MATH 225 Calculus III	3cr
<b>Free Electives:</b>	16-22	MATH 241 Differential Equations	3cr
<b>Total Degree Requirements:</b>	120	Foreign Language Intermediate Level (2)	0-6
		<b>Free Electives:</b>	12-18
		<b>Total Degree Requirements:</b>	120
(1) Credits are counted in the Liberal Studies Natural Science requirement.		(1) Credits are counted in the Liberal Studies Natural Science requirement.	
(2) PHYS 115 may replace 131, PHYS 116 may replace 132.		(2) Six credits of computer programming will substitute	

<p>(3) EOPT courses are offered at the Northpointe campus.</p> <p>(4) Six credits of computer programming will substitute for the foreign language requirement: COSC 110, 210, or higher-level Computer Science courses (COSC 250 recommended), with department permission.</p>		<p>for the foreign language requirement: COSC 110, 210, or higher-level Computer Science courses (COSC 250 recommended), with department permission.</p>
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- b. List of all associated course changes (new and revised course, number title, or description changes, and deletions)
- i) Courses added:
    - (a) EOPT 130 *Introduction to optics* (4cr) {new course}
    - (b) EOPT 210 *Detection and Measurement* (3cr)
    - (c) EOPT 220 *Introduction to Lasers* (3cr)
    - (d) MATH 225 *Calculus III* (3cr)
  - ii) Courses removed:
    - (a) EOPT 110 *Geometric Optics* (3cr)
    - (b) EOPT 120 *Wave Optics* (3cr)
    - (c) EOPT 126 *Electronics II for Electro-Optics* (3cr)
  - iii) Course option added:
    - (a) COSC 210 *Object-Oriented and GUI Programming* (3cr), alternative to COSC 250 *Introduction to Numerical Methods* (3cr)
    - (b) PHYS 355 *Computer Interfacing* (3cr), alternative to EOPT 105 *Computer Interfacing in Electro-Optics* (3cr)

#### Rationale for Change

The Electro-Optics Track (EO) program is being moved to the Indiana Campus. After this move, the EO students will have a greater variety of course choices. It is the opinion of the physics department that the EO program has been under-enrolled due to the lack of required courses offered at the Northpointe campus. Moving the program to the main campus necessitates a program revision to make use of courses offered in Indiana. The revised B.S. program is shown below.

ia) EOPT 130 *Introduction to Optics* is added to replace EOPT 110 *Geometric Optics* and EOPT 120 *Wave Optics*. Some of the content in EOPT 110 and EOPT 120 is duplicated in EOPT 132. Material that was in EOPT 110 and 120 not covered in PHYS 132 will be presented in a new course, EOPT 130/

ib) & ic) EOPT 210 *Detection and Measurement* and EOPT 220 *Introduction to Lasers* are added to the “Additional Required Courses” for the B.S. Physics/EO track. These two courses are required by the A.S. program, because they provide important knowledge and skills needed in the field. The B.S. Physics/EO students should take them as well. A student in the B.S. program would be able to receive the A.S. Degree while still working on the B.S.

id) MATH 225 *Calculus III* is added to the “Other Requirements”, because it covers line and surface integrals, which are needed for the studying electric fields in PHYS 451 *Electricity and Magnetism*.

ii) EOPT 110 *Geometric Optics*, EOPT 120 *Wave Optics* and EOPT 126 *Electronics II* are deleted in the A.S. Program revision, because the contents in these three courses overlap with some of the physics courses they will take earlier in the course sequence. Hence the contents of EOPT 110 and EOPT 120 that are not covered in Physics prerequisites will be taught in EOPT 130 *Introduction to Optics*. In addition all the students will take upper level physics course EOPT 345 *Optics*. Similarly, EOPT 125 *Electronics I* will be enough to cover the needed knowledge and skills in electronics.

iiia) COSC 210 *Object-Oriented and GUI Programming* is added as the alternative to COSC 250 *Introduction to Numerical Methods*, because COSC 210 is very useful for EO students to understand graphical user interface programs used in computer controlled electro-optics equipment, which is covered under EOPT 105 *Computer Interfacing in Electro-Optics*. Plus the COSC 250 is not offered every year.

iiib) PHYS 355 *Computer Interfacing* is added as the alternative to EOPT 105 *Computer Interfacing in Electro-Optics*, because PHYS 355 covers more contents than EOPT 105, a better choice for the B.S. students who already take COSC 110 which is the prerequisite for PHYS 355.

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

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

Students currently in the program will be allowed to use similar courses they have completed in place of the courses now required.

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.

Yes, we have enough faculty members in the Physics Department who will teach these courses offered by the Program.

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

Yes, with the help from the department and college, we are making all the necessary arrangement to accommodate the space needed at the Indiana Campus for these courses.

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?

Right now we have a small enrollment. With the proposed revision, we will expect an increase in the number of students. However, we will not see a big jump in the student number due to the nature of the program.

### Part IV. Periodic Assessment

Departments are responsible for an on-going review of curriculum. Include information about the department's plan for program evaluation.

The assessment of the proposed changes described in the proposal will be performed as part of the Physics Department's overall curriculum assessment policies.

### Part V. Course Proposals

Department are responsible for an on-going course proposal for any new courses added, revised, or deleted as a result of this program revision. A course analysis questionnaire and syllabus must be included for each course.

See the forms attached for each course in the Packet of the A.S. EOLET Program Revision Proposal.

### Part VI. Letter of Support or Acknowledgement

Sign-off letters from interested or affected departments including a letter from the Liberal Studies Committee if appropriate. (See page 3 for guidelines.)

See the emails attached Below:

The email requests have been sent to the departments of Math and Computer Science. The response from Computer Science is copied below.

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From: William W Oblitey  
Sent: Thursday 29 November 2012 8:22 AM  
To: Devki Talwar  
Subject: Re: Fw: see the 2 course replacement forms and 2 course option forms attached (Email 4 of n)

Hi Devki,  
The Computer Science Department fully supports the choice of COSC 110 for your B.S. Physics/EOPLET track and we also agree to your addition of COSC 210 as an option in lieu of COSC 250.  
We plan on working with your department to make sure that there are enough seats for both your students and our students each semester.

Wishing things are well with you personally.  
-Bill Oblitey  
Chair, Computer Science

On Wed, 28 Nov 2012 20:36:18 -0500  
"Devki Talwar" <[talwar@iup.edu](mailto:talwar@iup.edu)> wrote:

Hello Francisco and Bill,  
As we are in the process of revising the A.S. and B.S EOPLET programs – bringing them from the Northpointe to the main campus, we need a letter of support:

Computer Science: In the revised program COSC 101 is replaced by COSC 110 for the B.S. Physics/EOPLET track and added COSC 210 as an option in lieu of COSC 250  
Math: In the revised program MATH 225 is added for the B.S. Physics/EOPLET track

If you have any questions pl. do not hesitate to contact me.

Thanks

Devki

----- Original Message -----

**From:** Edel Reilly  
**To:** f.zhou@iup.edu  
**Sent:** Monday, December 10, 2012 2:25 PM  
**Subject:** Support for revising A.S. and B.S. EOPLET programs

Hello Andy,

This is to let you know that the Mathematics Department supports adding MATH 225 for the B.S. Physics/EOPLET track.

Please let me know if you need any additional information.

Edel

Dr. Edel Reilly  
Assistant Chairperson Mathematics Department  
University Senate Secretary  
Coordinator of Elementary and Middle Level Mathematics  
236 Stright Hall  
Indiana University of PA  
(724)357 7907