Contact

Person:

Proposing

Catalog Description

14-165 UWUCE App-4/14/15 Senate App-4128/15

New Course Proposal Template

Steps to the approval process:

- 1. Complete the applicable template(s) and email them to the departmental or program curriculum committee chair.
- 2. The curriculum chair emails the proposal to the curriculum committee, then to the department/program faculty for a vote and finally to the department/program chair.
- 3. The department/program chair emails the proposal to curriculum-approval@iup.edu; this email will also serve as an electronic signature.
- 4. Curriculum committee staff will log the proposal, forward it to the appropriate dean's office(s) for review within 14 days and post it on the X Drive for review by all IUP faculty and administrators. Following the dean's review the proposal goes to the UWUCC/UWGC and the Senate.

Email

Phone:

Address:

Talwar@iup.edu

7-2370

5. Questions? Email curriculum-approval@iup.edu.

Devki Talwar

Physics Department

Depart/Unit:	
Course Prefix/Number	See the Registrar's list of Unavailable course numbers at http://www.iup.edu/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=129323 . PHYS 260
Course Title	Introduction to Nanoscience and Technology
Dual/Cross Listed	Dual Listed = Courses listed at two levels, such as undergraduate and graduate, masters and doctoral, etc. Cross Listed = Course has more than one prefix such as GEOG/RGPL 233. Yes No If yes with: Click here to enter text.
Number of Credits	(UG) Class Hours - 3 (UG) Lab Hours - 0 Credits - 3
Prerequisite(s)	PHYS 112 or 132
Corequisite(s)	This means that another course must be taken in the same semester as the proposed course Click here to enter text.
Additional Information (Check all that apply. Note: Additional documentation will be required)	 □ Liberal Studies (please also complete Template C) □ Teacher Education (Is it Step 1 a prerequisite or is it part of the Professional Education Sequence If so please also complete Template D) □ Distance Education (Please also complete Template E)
Recommended Class Size (optional) (provide justification)	Are you recommending a class size: Yes X No Number: Click here to enter text. If yes: (check one of the following reasons and provide a narrative explanation) Pedagogical Physical limitation of classroom Accreditation body standards/recommendations

Guidelines: Do not include pre/co-requisite information here. The registrar prefers a concise description of course content,

Explanation (required): Click here to enter text.

beginning with an active verb.

	PHYS 260 Introduction to Nanoscience and Technology	3c-01-3cr
	Introduction to the theoretical and experimental concepts of the eme nanotechnology. Prepares students from a wide range of disciplines studies in areas involving nanotechnology. Inherently interdisciplina across physics, chemistry, biology, and computer science. Covers the nanostructure materials for current and future applications in the fiel energy, textiles, and medicine	for careers or higher ry in nature, bridges e emerging role of
Student Learning	Upon successful completion of this course students should be able to:	
Outcomes (These should be measurable, appropriate to the course level, and phrased in terms of student achievement, not instructional or content outcomes)	1.Discuss the history of nanotechnology and where the field may evolve over the 2.Describe properties and applications of nanoscale materials. 3.Apply the key concepts of physics, chemistry, biology and engineering to the fieconsumer markets. 4. Discuss safety and technological issues associated with nanoscience and technological issues.	eld of nanotechnology in
lf dual listed, indicate additional learning objectives for the higher level course.		
iever course.	1.Introduction to the practice and discipline of nanoscience and technology	
	A. Nano and Nature 1) Our technologies and the world we live in	
	2) Nano and nature	
	Definitions, history and current practices Nanotechnology – the beginning	
	5) Overview of current industrial applications	
	B. Physics basis and principles of nanotechnology	
	Overview of chemistry fundamentals for nanotechn	ology
	Overview of biology fundamentals for nanotechnole	ogy
	2. Experimental methods – investigating /manipulating materials in the nanoscale	
	A. Electron microscopes B. Scanning probe microscopes	
	C. Optical microscopes	
Brief Course Outline:	D. Other associated techniques	
sufficient detail to communicate the course content to faculty across campus. It is not necessary to include specific readings, calendar, or assignments.	3.Diversity in nano-systems	
	 A. Carbon nanotube technology (CNT) – from graphite to bucky-balls to 	CNT
	B. Physical and mechanical properties	
	C. CNT applications D. Self-assembled monolayers (SAMS)	
	E. SAMS applications	
	F. Semiconductor quantum dots	
	4.Nanobiology	
	A. Interaction between biomolecules and nanoparticle surfaces	
	B. Different types of inorganic materials used for the synthesis of hybrid	
	nano-bio assemblies C. Current status of Nano-biotechnology	
	D.Future perspectives of Nano-biotechnology	
	E. Nano-probes for analytical applications – a new methodology in medical diagnosis	
	5.Nano-sensors/Nano-medicines	
	A. What is a sensor	
	B. Nano-sensors – what makes them possible?	
	C. Nano-biosensors D. Sensors of the future	

	E. Nanotechnology in diagnostic applications F. Materials for use in diagnostic and therapeutic applications				
	6.Societal implications of nanoscience and technology				
	A. Issues – an outlook				
	B. Nanotech and war – nano arms race C. Public perception and public involvement				
Rationale for Proposal					
Why is this course	Click here to enter text.				
being proposed?					
	☐ Major Requirement ☐ Minor Requirement ☐ Core Requirement (Interdisciplinary core—				
How does it fit into	Business/Education)				
the departmental curriculum? (Check all	☐ Required Elective ☐ Liberal Studies ☐ Open Elective				
that apply)	☐ Other - Click here to enter text.				
Is a similar class	□Yes				
offered in other	Please provide comment: Click here to enter text.				
departments? Does it serve the	⊠ No				
college/university	⊠ Yes Please provide comment: This course will acquaint students in the college with the				
above and beyond the role it serves in the	Please provide comment: This course will acquaint students in the college with the Nanotechnology manufacturing program – a very rewarding experience available to most science students.				
department?	□ No				
	⊠ Course Designed for Majors (□ Required				
	☐ Course Designed for Minor ☐ Departmental Elective				
Who is the target	2 Course Designed for Nimor				
audience for the	☐ Restricted to Majors/Minors ☐ Open to Any Student				
course?					
	☐ Liberal Studies				
	☐ Other - Click here to enter text.				
	A. What are the implications for other departments (For example: overlap of content with other				
	disciplines, requirements for other programs)? Students from other departments in the College of Natural Science and Mathematics are welcomed to)			
Implications for other	enroll in this course, specifically Chemistry and Biology				
departments	B. How have you addressed this with other department(s) involved? What was the				
	outcome of that attempt? (Attach documents as appropriate)				
	We will post flyers around the science building, making these students aware of this course.				
For Dean's Review					
Are resources available/sufficient for this course? □ Yes □ No □ NA					
■ Is the proposal congruent with college mission? □ Yes □ No □ NA					
Has the proposer attempted to resolve potential conflicts with other academic units? ☐ Yes ☐ No					
□ NA					