

Template A

	<p>PHYS 260 Introduction to Nanoscience and Technology 3c-0l-3cr</p> <p>Introduction to the theoretical and experimental concepts of the emerging field of nanotechnology. Prepares students from a wide range of disciplines for careers or higher studies in areas involving nanotechnology. Inherently interdisciplinary in nature, bridges across physics, chemistry, biology, and computer science. Covers the emerging role of nanostructure materials for current and future applications in the fields of electronics, energy, textiles, and medicine</p>
<p>Student Learning Outcomes</p> <p><i>(These should be measurable, appropriate to the course level, and phrased in terms of student achievement, not instructional or content outcomes)</i></p> <p><i>If dual listed, indicate additional learning objectives for the higher level course.</i></p>	<p>Upon successful completion of this course students should be able to:</p> <ol style="list-style-type: none"> 1. Discuss the history of nanotechnology and where the field may evolve over the next 10-15 years. 2. Describe properties and applications of nanoscale materials. 3. Apply the key concepts of physics, chemistry, biology and engineering to the field of nanotechnology in consumer markets. 4. Discuss safety and technological issues associated with nanoscience and technology..
<p>Brief Course Outline:</p> <p><i>Give an outline of sufficient detail to communicate the course content to faculty across campus. It is not necessary to include specific readings, calendar, or assignments.</i></p>	<ol style="list-style-type: none"> 1. Introduction to the practice and discipline of nanoscience and technology <ol style="list-style-type: none"> A. Nano and Nature <ol style="list-style-type: none"> 1) Our technologies and the world we live in 2) Nano and nature 3) Definitions, history and current practices 4) Nanotechnology – the beginning 5) Overview of current industrial applications B. Physics basis and principles of nanotechnology <ol style="list-style-type: none"> 1) Overview of chemistry fundamentals for nanotechnology 2) Overview of biology fundamentals for nanotechnology 2. Experimental methods – investigating /manipulating materials in the nanoscale <ol style="list-style-type: none"> A. Electron microscopes B. Scanning probe microscopes C. Optical microscopes D. Other associated techniques 3. Diversity in nano-systems <ol style="list-style-type: none"> 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 <ol style="list-style-type: none"> 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 <ol style="list-style-type: none"> A. What is a sensor B. Nano-sensors – what makes them possible? C. Nano-biosensors D. Sensors of the future

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	<p>E. Nanotechnology in diagnostic applications F. Materials for use in diagnostic and therapeutic applications</p> <p>6. Societal implications of nanoscience and technology A. Issues – an outlook B. Nanotech and war – nano arms race C. Public perception and public involvement</p>
Rationale for Proposal	
Why is this course being proposed?	Click here to enter text.
How does it fit into the departmental curriculum? (Check all that apply)	<input type="checkbox"/> Major Requirement <input type="checkbox"/> Minor Requirement <input type="checkbox"/> Core Requirement <i>(Interdisciplinary core – e.g Business/Education)</i> <input checked="" type="checkbox"/> Required Elective <input type="checkbox"/> Liberal Studies <input type="checkbox"/> Open Elective <input type="checkbox"/> Other - Click here to enter text.
Is a similar class offered in other departments?	<input type="checkbox"/> Yes Please provide comment: Click here to enter text. <input checked="" type="checkbox"/> No
Does it serve the college/university above and beyond the role it serves in the department?	<input checked="" type="checkbox"/> Yes 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. <input type="checkbox"/> No
Who is the target audience for the course?	<input checked="" type="checkbox"/> Course Designed for Majors (<input type="checkbox"/> Required <input checked="" type="checkbox"/> Not Required) <input checked="" type="checkbox"/> Course Designed for Minor <input checked="" type="checkbox"/> Departmental Elective <input type="checkbox"/> Restricted to Majors/Minors <input checked="" type="checkbox"/> Open to Any Student <input type="checkbox"/> Liberal Studies <input type="checkbox"/> Other - Click here to enter text.
Implications for other departments	<p>A. What are the implications for other departments (<i>For example: overlap of content with other disciplines, requirements for other programs</i>)? Students from other departments in the College of Natural Science and Mathematics are welcomed to enroll in this course, specifically Chemistry and Biology</p> <p>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.</p>
For Dean's Review	
<ul style="list-style-type: none"> • Are resources available/sufficient for this course? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA • Is the proposal congruent with college mission? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA • Has the proposer attempted to resolve potential conflicts with other academic units? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA 	