

**Core Curriculum Course Submission
Criteria: Science**

1. General Information

a. Originating Person	b. Contact Person's E-mail	c. Contact Phone	d. Date
Al Adams	ajadams@ualr.edu	(501)554-3856	11/20/2015
e. College/School	f. Department/Program		
College of Arts, Letters, Sciences	Physics and Astronomy		

Submission Statement

By submitting this form, we acknowledge our understanding that the Core Council has the authority to review approved courses to ensure they continue to meet the established goals and outcomes of that category of the core; that the Council has authority to develop a core assessment program; and that the Council will be developing review and assessment policies by the end of 2014. Further, we agree that if this course is approved, we will participate in the university-wide assessment of the core.

Chair and Dean Awareness

A separate statement from the chair must be included that states that the department faculty have approved this course for submission to the core and that the chair takes responsibility for informing the Dean about the submission of the course.

2. Course Information

a. Course ID	b. Current Title
PHYS 2322/2122	Physics for Scientists and Engineers II/Physics for Scientists and Engineers II Laboratory

c. Catalog Description

Prerequisites: PHYS 2321 and MATH 1305 or 1452. Continuation of PHYS 2321 for students majoring in physics, astronomy, chemistry, computer science, engineering, geology, information science, mathematics, and systems engineering. Topics include electricity, magnetism, optics, relativity, and quantum physics. Three hours of lecture and one hour optional discussion. Three credit hours. (ACTS Course Number PHYS 2044) ;Prerequisite or corequisite: PHYS 2322. Two hours laboratory. One credit hour. (ACTS Course Number PHYS 2044)

d. How will your department ensure a level of consistency among sections of this course? Who will be responsible for this?

The Department of Physics and Astronomy has a standing Curriculum Committee charged with overseeing the introductory courses along with the associated laboratories. During the week prior to the beginning of each semester the departmental Curriculum Committee will meet with the instructors for the sections of PHYS 2322 and PHYS 2122 and review educational goals, the learning outcomes, the learning objectives, and the assignments that support the objectives and share the syllabi from previous semesters. During the first week of classes each semester the Curriculum Committee will review the course syllabus as created by the section instructors to make sure all the guidelines for Core Courses are being met.

Educational Goals	Learning Outcomes Students will	Learning Objectives At the end of the course students will be able to	Assignments	Explanation
Knowledge 1 -Concepts, methodologies, findings, and applications of mathematics and the social and natural sciences, engineering and technology.	1. understand the theoretical perspective used in one or more science discipline;	Learning Objectives 1.1 understand the principles and concepts of electricity and magnetism, optics, and selected topics from modern physics	Assignments 1.1 In-class exams, on-line homework, and laboratory reports	Explanation 1.1 In working physics problems or exercises either in a group setting or as individuals, students will develop the knowledge and skills to apply concepts to actual examples
	2. understand observational and experimental methods used in one or more of the sciences;	Learning Objectives 1.2 collect, analyze, and model data describing physical phenomena	Assignments 1.2 Students will carry out laboratory experiments over the course of the semester and write the laboratory reports including data measurement and analysis	Explanation 1.2 Students will experience firsthand the nature of science by making measurements and then using sound reasoning skills to interpret the data and form models that provide a useful way to think about the physical system.
	3. understand applications and limitations of the sciences;	Learning Objectives 1.3 identify and quantify the accuracy and precision of quantitative data as limiting	Assignments 1.3 In-class activities, exams, and laboratory assignments	Explanation 1.3 Science focuses on those aspects of knowledge that lend themselves to

		<p>factors in validating models and interpretations</p>		<p>measurement and verification. Students should recognize that measurements and data are limited in accuracy and thus interpretation.</p>
Educational Goals	Learning Outcomes students will	Learning Objectives. At the end of the course, students will be able to	Assignments	Explanation
<p>Skills 1 - Communication</p>	<p>1. develop an understanding of how to communicate scientific procedures, results from the inquiry and conclusions resulting from applying the scientific method;</p>	<p>Learning Objectives 1.1 gather, organize, and present data and interpretations in written, equation and graphical/pictorial formats</p>	<p>Assignments 1.1 Class activities, laboratory exercises and reports</p>	<p>Explanation 1.1 Weekly laboratory sessions, in addition to in-class exercises, will model the scientific method starting with hypothesis and ending with interpretation of results. Assignments require clear and adequately explained methods, analysis, results and conclusions</p>
Educational Goals	Learning Outcomes students will	Learning Objectives. At the end of the course, students will be able to	Assignments	Explanation
<p>Skills 2 - Critical Thinking, Quantitative Reasoning, and Solving Problems Individually and Collaboratively</p>	<p>1. develop basic skills from the scientific method including inquiry, data collection, analysis, and interpretation in order to explore a scientific problem from hypothesis testing to formulating a conclusion based on the inquiry;</p>	<p>Learning Objectives 2.1 hypothesize a problem, collect, analyze, and interpret data; present evidence to support conclusions.</p>	<p>Assignments 2.1 Laboratory exercises and reports</p>	<p>Explanation 2.1 Assignments will require laboratory exercises that model the scientific process, including observation, data collection, analysis, and conclusions.</p>
	<p>2. learn about the world through observation and experimentation, through modeling and interpretation, and through analysis and evaluation;</p>	<p>Learning Objectives 2.2 utilize the skills of scientific experimentation, mathematical modeling and analysis of data to solve real world problems</p>	<p>Assignments 2.2 Laboratory activities and in-class exercises, which model the scientific process of observation, experimentation, and analysis to make sense of</p>	<p>Explanation 2.2 Assignments will require students to apply the scientific method of gathering, analyzing, and presenting data. Students will master this activity by</p>



the world around us

multiple class and laboratory activities and reports.

Educational Goals	Learning Outcomes students will	Learning Objectives. At the end of the course students will be able to	Assignments	Explanation
Skills 3 - Information Technology	1. develop and apply technological tools for inquiry, analysis, and presentation of scientific information and data;	Learning Objectives 3.1 use word processing and spreadsheet programs, graphing calculator or computer mathematical software, and electronic interfaces for laboratory measurements	Assignments 3.1 laboratory activities and reports, in-class activities, and exams	Explanation 3.1 Students will acquire the computer-based skills to collect, analyze, and present numerical and graphical data
Values 1 - Personal Responsibility and Ethical Behavior	1. take responsibility for completing assignments in an ethical manner, working on one's own when required and acknowledging resources when used;	Learning Objectives 1.1 understand and comply with UALR's policy on academic integrity	Assignments 1.1 Students will sign course expectation forms provided with syllabus outlining academic dishonesty and classroom behavior expectations. On each exam, students will sign a statement that no help was provided to or by another person. All assignments must use proper citation practices, where applicable.	Explanation 1.1 By signing the course expectation form students will be reminded of the ethical standards which govern our society and verify they understand class expectations. When designated by the instructor students are expected to work individually to show their understanding of key concepts. Students are expected to identify and acknowledge work done by others.
	2. develop an understanding of the ethical obligations in conducting research, and of being precise and accurate with data, including how this obligation applies to communication of information;	Learning Objectives 1.2 understand the necessity of accurately representing data and its impact on conclusions that can be drawn from that data.	Assignments 1.2 Laboratory exercises and reports, discussions, and class activities	Explanation 1.2 In laboratory activities students must collect, analyze, and interpret data to draw supported conclusions. Class activities require students to evaluate, interpret, and communicate their

