Core Curriculum Course Submission
Criteria: Science

1. General Information

a. Originating Person	b. Contact Person's E-mail	c. Contact Phone	d. Date
Hye-won Seo	hwseo@ualr.edu	(501)569-8965	04/14/2014

e. College/School	f. Department/Program
College of Arts, Letters, & Sciences	Physics & 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**

Your department chairperson and college dean must be made aware of your submission for core. By submitting this form, you are acknowledging that this has occurred.

2. Course Information

a. Course ID	b. Current Title
PHYS2321, PHYS2121	Physics for Scientists and Engineers I/Physics for Scientists and Engineers I Laboratory

c. Catalog Description

PHYS 2321 Physics for Scientists and Engineers I
Prerequisite: MATH 1304 or 1451. A calculus-based introduction to the fundamental principles underlying classical physics and modern physics and the applications of those principles in science and engineering. Three hours of lecture and one hour optional discussion. Three credit hours. (ACTS Course Number PHYS 2034)

PHYS 2121 Physics for Scientists and Engineers I Laboratory
Prerequisite or corequisite: PHYS 2321. Two hours laboratory. One credit hour. (ACTS Course Number PHYS 2034)

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 first week of classes each semester the Curriculum Committee will meet the instructors and review educational goals, the learning outcomes, and the learning objectives to make sure all the guidelines for Core Courses are being met.

The end-semester test will be given in the last week of the classes for the assessment. The results will be shared and discussed in a regular manor among all the instructors and Curriculum committee

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 kinetics and dynamics of translational motion and rotational motions, and statistical thermodynamics.	**Assignments 1.1** In-class exam, on-line homework and laboratory reports	**Explanation 1.1** In working physics problems or exercise either in a group setting or as individuals, students will develop the knowledge and skills required 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 1) carry out laboratory experiments over the course of a semester, and 2) write the laboratory reports including data measurements 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 factors in validating models and interpretations.	**Assignments 1.3** In-class activities, exams, and laboratory assignments.	**Explanation 1.3** Science focuses on those aspects of knowledge that lend themselves to measurement and verification. Students should also recognize that measurements and data are limited in accuracy and interpretation.

Educational Goals	Learning Outcomes students will...	Learning Objectives: At the end of the course students will be able to...	Assignments	Explanation
Skills 1 – Communication	1. develop an understanding of how to communicate scientific procedures, results from the inquiry and conclusions resulting from applying the scientific method;	**Learning Objectives 1.1** gather, organize, and present data and interpretations in written, equation and graphical/pictorial formats	**Assignments 1.1** Class activities, laboratory exercises and reports	**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.
Educational Goals	Learning Outcomes students will...	Learning Objectives: At the end of the course students will be able to...	Assignments	Explanation
Skills 2 – Critical Thinking, Quantitative Reasoning, and Solving Problems Individually and Collaboratively	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;	**Learning Objectives 2.1** hypothesize a problem; collect, analyze, and interpret data; and present evidence to support conclusions.	**Assignments 2.1** Laboratory exercises and reports.	**Explanation 2.1** Laboratory exercises will model the scientific process, including observation, data collection, analysis, and conclusions.
	2. learn about the world through observation and experimentation, through modeling and interpretation, and through analysis and evaluation;	**Learning Objectives 2.2** utilize the skills of scientific experimentation, mathematical modeling and analysis of data to solve real world problems.	**Assignments 2.2** Laboratory activities and in-class exercises, which model the scientific process of observation, experimentation, and analysis to interpret the world around us.	**Explanation 2.2** Assignments will require students to apply the scientific process of gathering, analyzing and presenting data. Students will master this process through multiple class and laboratory activities and reports.

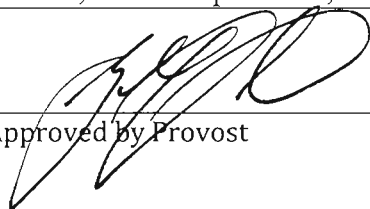| Educational Goals	Learning Outcomes students will...	Learning Objectives: At the end of the course students will be able to...	Assignments	Explanation
Skills 3 – Information Technology	1. develop and apply technological tools for inquiry, analysis, and presentation of scientific information and data;	**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** Student will acquire the computer based skills to collect, analyze and present numerical and graphical data.
Educational Goals	**Learning Outcomes students will...**	**Learning Objectives: At the end of the course students will be able to...**	**Assignments**	**Explanation**
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 code of student conduct.	**Assignments 1.1** Students will sign course expectation form 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. 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 findings.

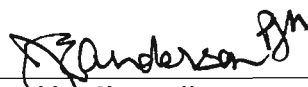| Educational Goals	Learning Outcomes students will...	Learning Objectives: At the end of the course students will be able to...	Assignments	Explanation
Values 2 – Civic Responsibility	1. develop an understanding of the ethical issues that may result when applying scientific knowledge that is incomplete.	**Learning Objectives 2.1** understand the impact the current state of scientific knowledge has on economic, political, governmental and environmental problems.	**Assignments 2.1** In-class and Laboratory assignments and discussions will be conducted.	**Explanation 2.1** Assignments and discussions will require students to address implications of our scientific progress and compare competing models using available facts.

Additional Comments:

Classroom assignments consist of a variety of formats including quizzes, lecture tutorials, data interpretation, and writing assignments.

Belinda Blevins-Knabe   5-14-14

Approved by Core Curriculum Committee   Date

Anderson   5/28/14

Approved by Chancellor   Date

[signature]   5/23/2014

Approved by Provost   Date