

Request for Courses in the Core Curriculum

**Originating Department or College:** Engineering, Mathematics, and Physics / College of Arts and Sciences

**Person Making Request:** Dr. Qingwen Ni

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**Course Number and Title:** ASTR 1110 Principles of Astronomy Laboratory

Please attach in separate documents:

Completed Catalog Add/Change Form

Syllabus

List the student learning outcomes for the course (Statements of what students will know and/or be able to do as a result of taking this course. See appended hints for constructing these statements.)

Upon successful completion of this course, the students will be able to:

1. explain the use of basic astronomical tools, such as a telescope and a spectroscope.
2. conduct experiments and collect experimental data
3. perform calculations, interpret results, and identify sources of errors
4. compare experimental data with theoretical predictions.
5. plot experimental data and determine physical parameters from a graph.
6. use astronomical data from tables and graphs to explain concepts in astronomy.
7. prepare and submit laboratory reports
8. design and implement a scientific experiment to test basic astronomy principles
9. deliver oral presentations with appropriate visual aids.

Component Area for which the course is being proposed (check one):

Communication

Mathematics

Language, Philosophy, & Culture

Creative Arts

Life & Physical Sciences

American History

Government/Political Science

Social & Behavioral Science

Component Area Option

Competency areas addressed by the course (refer to the appended chart for competencies that are required and optional in each component area):

Critical Thinking

Communication Skills

Written Communication

Oral Communication

Visual Communication

Empirical & Quantitative Skills

Teamwork

Personal Responsibility

Social Responsibility

Because we will be assessing student learning outcomes across multiple core courses, assessment assigned in your course must include assessment of the core competencies. For each competency checked above, indicate the specific course assignment(s) which, when completed by students, will provide evidence of the competency. Provide detailed information, such as copies of the paper or project assignment, copies of individual test items, etc. A single assignment may be used to provide data for multiple competencies.

**Critical Thinking:**

This course is designed to enhance students' critical thinking through laboratory experiments that involve using instruments, collecting data, interpreting results, and deriving conclusions (SLOs 1, 2, 3, 4, 5, and 6). Students will work in groups of four to design and implement a "Principles of Astronomy Laboratory Experiment." Students must employ critical thinking skills to decide which parameters and variables are used in the construction of a testable hypothesis in order to draw proper conclusions based on the collected data. Student will submit a detailed laboratory report that will be used to evaluate their critical thinking abilities. The critical thinking rubric that is being developed by a subcommittee of the University Core Curriculum Committee, or a modified version, will be used by the instructor or the Department Assessment Committee to evaluate the laboratory experiment and laboratory report.

**Communication Skills:**

Students will develop a PowerPoint presentation, with appropriate visual aids, and present their "Principles of Astronomy Laboratory Experiment" and results in class (SLO 9). The presentation will include background information, methods used in the design process, summary of results, graphs, and tables. Students will also discuss the significance of their results and sources of the errors, if any. The presentation will be used to help students demonstrate their communication skills. The rubric that is being developed by a subcommittee of the University Core Curriculum Committee, or a modified version, will be used by the instructor or the Department Assessment Committee to evaluate students' communication skills.

**Empirical & Quantitative Skills:**

This course includes laboratory experiments that help students apply theories learned in class (SLOs 2, 3, 4, 5, 6, 7, and 8). The "Principles of Astronomy Laboratory Experiment" that students design and implement in this course will allow them to use instruments, collect data, perform calculations, manipulate numerical data, graph results, and interpret data. The laboratory report that students submit and a copy of their power point presentation will be used to demonstrate students' empirical and quantitative abilities. The rubric that is being developed by a subcommittee of the University Core Curriculum Committee, or a modified version, will be used by the instructor or the Department Assessment Committee to evaluate students' performance.

**Teamwork:** N/A

Will the syllabus vary across multiple sections of the course?     Yes                                     No  
If yes, list the assignments that will be constant across the sections:

Inclusion in the core is contingent upon the course being offered and taught at least once every other academic year. Courses will be reviewed for renewal every five (5) years.

The department understands that instructors will be expected to provide student work and to participate in university-wide assessments of student work. This could include, but may not be limited to, designing instruments such as rubrics, and scoring work by students in this or other courses. In addition, instructors of core courses may be asked to include brief assessment activities in their courses.

Reviewed and approved by the Core Curriculum Committee on April 19, 2013.