

## PROPOSAL FOR A UNIVERSITY STUDIES CORE OR ELECTIVE COURSE

**University Studies Thematic Category: Scientific Inquiry, Methodologies, and Quant.**

### **Skills**

**Course Prefix/Number: AST 115/116**

**Course Title: Introductory Astronomy/Laboratory**

**Course Credit Hours: 3/1**

**Catalog Course Description:** AST 115: A descriptive examination of the principal objects of the universe, i.e. planets, moons, stars, and galaxies, the fundamental theories concerning them, with something of the means and methods which led to the known facts and accepted theories. AST 116: A laboratory course that provides students with experience using the tools and principles that astronomers use to gain understanding of the universe. AST116 is a co-requisite to AST115.

**Course Objectives:** The objectives of the course include providing students with an:

- A. historical perspective of astronomy.
- B. appreciation of the physical laws which may be used to describe the behavior of the universe and its components.
- C. introduction to various observational tools used in astronomy.
- D. introduction to the constituents of our solar system, including their descriptions and motions.
- E. introduction to the motions and life-cycles of stars.
- F. introduction to galaxies and the evolution of the universe.
- G. introduction to simple measurements and observational techniques.

**Course Syllabus:** *(copied into online form)*

**Department: Engineering and Physics**

**Person Submitting the Proposal: Steve Cobb**

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### **Before responding to the prompts below, please reflect upon the University Studies Mission Statement:**

The University Studies component of the Murray State University undergraduate program aims to provide students with a broad-based, liberal arts and sciences education and a foundation for their academic specialty. University Studies courses should: develop students' communication skills; encourage students to think creatively while gathering, analyzing, and evaluating information to reach logical decisions; and familiarize students with the roles and applications of science and technology toward resolving problems in an ever-changing world. Furthermore, students will gain a critical understanding of the world's historical, literary, philosophical, and artistic traditions. Within this broad context, students will come to understand the dynamics of cultural diversity, of competing economic and political systems, of social responsibility and of complex moral and ethical issues.

**1. Why are the skills and content of this course important for MSU students outside your discipline? (150 word limit)**

- Astronomy is one of the oldest sciences, and its historical development models the progression of scientific thought and discovery over time.
- The methods used to study astronomy give a good example of the scientific method and the continuous refinement of scientific theories.
- The sun is the source of our life-sustaining energy; the Earth's tilt gives us our seasons, a planet's rotation gives day/night; tides, eclipses, and navigation are all astronomy-related.
- Astronomy can serve as a basis for discussion of the intersection of scientific thought, religious beliefs, political/diplomatic relations, and agricultural/industrial/economic policy.
- Astronomy can serve as the basis for discussion on the origins and future of the universe and humankind.
- We are part of a generation able to explore worlds other than our own, and an understanding of astronomy will help us draw correct conclusions from these activities.

**2. How does this course facilitate the development of the Characteristics of the MSU Graduate as related to the thematic category you selected above? Please be sure to include the number of each characteristic. (150 word limit)**

- Introduces students to the prevailing methods and theories that scientists use to observe and describe the universe. (Char. #2)
- Introduces students to observational tools used in astronomy, helping them apply sound standards of information gathering, analysis, and evaluation of data. (Char. #3)
- Provides examples of the history of scientific thought and discovery (Char. #4)
- Promotes an appreciation for the advanced technology and instrumentation that drive discovery in this discipline. (Char. #9)
- Facilitates student understanding of how our universe has changed over time, and how it continues to develop. (Char. #10)

**3. List specific instructional strategies or course activities that engage students in the learning process (e.g., real-life application, group work, discussions, projects, student use of technology, presentations, etc.), and promote students' content knowledge and skills development (e.g., critical thinking, problem-solving, issue-oriented, relevance, interdisciplinary, communication, culturally diverse perspectives, discipline-specific technology, etc.) (250 word limit)**

- Course requires a significant amount of reading to understand the underlying physical concepts that form the foundation of the discipline.
- Topics are presented in historical context, relating the philosophical, scientific, mathematical, and societal elements of the discipline.
- Written laboratory reports demonstrate students' ability to critically analyze and solve scientific problems, and to communicate the results of these activities.
- Graded reading quizzes and homework activities allow students to gauge their level of understanding and preparedness.
- Exam questions are comprised of a mixture of conceptual and quantitative problems, requiring a mastery of content knowledge and the ability to critically interpret and apply information.
- Classroom use of student Personal Response System, a computerized method of collecting feedback from students to gauge their understanding of content.

- Laboratory and classroom use of tablet PCs to enhance learning by giving access to photos and text from the internet, as well as providing a uniform platform for data recording and analysis.

Please note: Additional information may be requested and at some point in the future you may be asked to provide specific information on student-outcomes assessment.