## NEW COURSE PROPOSAL FORM

**TO:** CURRICULUM COMMITTEE

**ACADEMIC AREA:** MATH AND SCIENCES

**PROPOSEd by**: Theo Koupelis

**PRESENTER:** Dr. Peggy Romeo

**DATE:** 1/14/2011

**COURSE PREFIX, NUMBER AND TITLE:**

### AST 2004C AStronomy: STARS, GALAXies and cosmology

### SECTION I

**COURSE INFORMATION: TYPE iN THE APPROPRIATE INFORMATION FOR EACH ITEM:**

**DEPARTMENT:** Sciences

**COURSE PREREQUISITE(S):** Mat 1033 or Higher

**MINIMUM GRADE OF prereqUISITE(s):** C

**COURSE COREQUISITE(S):** n/a

**COURSE CREDITS OR CLOCK HOURS:** 4 CREDIT HOURS

**credit type:** COLLEGE CREDIT (TRANSFERABLE)

**CONTACT HOURS:** 5 CONTACT HOURS (3 for lecture, 2 for lab)

**COURSE DESCRIPTION:**

This course provides a survey of astronomy as a quantitative observational science. It is designed to provide an introduction to star formation, stellar properties, the lives and deaths of stars, galaxies and cosmology. AST 2003C and AST 2004C may be taken in any order.

**GENERAL TOPIC OUTLINE:**

* Astronomical tools and methods
* Stellar properties
* The interstellar medium and star formation
* The lives and deaths of low-mass stars
* The deaths of massive stars: neutron stars and black holes
* Our Galaxy
* A diversity of galaxies
* Cosmology
* The search for extraterrestrial intelligence

**LEARNING OUTCOMES:**

TYPE IN ALL OF THE LEARNING OUTCOMES, ASSESSMENTS AND GEN ED COMPETENCIES AS THEY SHOULD BE DISPLAYED IN THE SYLLABUS

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| **LEARNING OUTCOMES** | **ASSESSMENTS** | **GENERAL EDUCATION COMPETENCIES** |
| **Use the law of gravitation and the laws of motion to explain stellar orbits.** | Homework and/or quizzes and/or tests and/or group assignments and/or projects. |  |
| **Identify the various observational tools used in astronomy and categorize and differentiate the regions of the electromagnetic spectrum.** | Homework and/or quizzes and/or tests and/or group assignments and/or projects. |  |
| **Compare and contrast the different layers in the Sun’s interior and atmosphere; measure the Sun’s diameter using pinhole projection.** | Homework and/or quizzes and/or tests and/or group assignments and/or projects and/or lab reports. |  |
| **Compare the various methods of measuring distances and other stellar properties; measure the proper motion of Barnard’s star and determine the star’s overall motion in space.** | Homework and/or quizzes and/or tests and/or group assignments and/or projects and/or lab reports. |  |
| **Interpret the H-R diagram and use it to describe stellar evolution.** | Homework and/or quizzes and/or tests and/or group assignments and/or projects and/or lab reports. |  |
| **Describe the properties of the interstellar medium and theories of stellar formation.** | Homework and/or quizzes and/or tests and/or group assignments and/or projects. |  |
| **Trace and compare the life histories of stars of various masses.** | Homework and/or quizzes and/or tests and/or group assignments and/or projects. | COM |
| **Use the period-luminosity relationship for Cepheid variables and calculate their distances.** | Homework and/or quizzes and/or tests and/or group assignments and/or projects and/or lab reports. |  |
| **Compare the properties of white dwarfs, neutron stars, and black holes.** | Homework and/or quizzes and/or tests and/or group assignments and/or projects. |  |
| **Describe the physical makeup, stellar populations, and evolution of our Galaxy** | Homework and/or quizzes and/or tests and/or group assignments and/or projects. |  |
| **Construct the shape of our Galaxy and locate our position in it by using observational data of clusters of stars; construct a scale drawing of our Galaxy by using appropriate data for the diameter of the Sun, solar system, and Galaxy.** | Homework and/or quizzes and/or tests and/or group assignments and/or projects and/or lab reports. | CT, QR, TIM |
| **Compare the different types of galaxies and theories of their origin, and describe the nature of active galactic nuclei.** | Homework and/or quizzes and/or tests and/or group assignments and/or projects. |  |
| **Differentiate among cosmological models and identify their limitations.** | Homework and/or quizzes and/or tests and/or group assignments and/or projects. |  |
| **Deduce the size and age of the observable universe by using Hubble’s law.** | Homework and/or quizzes and/or tests and/or group assignments and/or projects and/or lab reports. |  |
| **Locate and observe deep sky objects using their coordinates and a telescope.** | Homework and/or quizzes and/or tests and/or group assignments and/or projects and/or lab reports. |  |
| **Describe efforts to communicate with extraterrestrial intelligence, develop one such method, and identify the obstacles astronomers face in pursuing such searches.** | Homework and/or quizzes and/or tests and/or group assignments and/or projects and/or lab reports. |  |

### SECTION II

**ICS CODE FOR THIS COURSE:** ADVANCED AND PROFESSIONAL - 1.11.19 - PHYSICAL SCIENCES

**IF YOU INTEND TO RESTRICT STUDENT REGISTRATION BASED ON THE STUDENTS’ MAJOR(S), ENTER ALL APPLICABLE MAJOR RESTRICTION CODE(S):** Click here to enter text.

**GRADE MODE:** STANDARD GRADING

**IS THIS A GENERAL EDUCATION COURSE?** YES

**IS THIS A WRITING INTENSIVE COURSE?** NO

**iS THIS AN HONORS COURSE?** NO

**IS THIS A REPEATABLE COURSE?** NO

**IF SO, WHAT IS THE MAXIMUM NUMBER OF CREDITS A STUDENT CAN EARN FOR THIS COURSE?** ENTER NUMBER

**DO YOU EXPECT TO OFFER THIS COURSE THREE TIMES OR LESS?** NO

**WILL THIS NEW COURSE HAVE AN IMPACT ON OTHER COURSES, PROGRAMS OR DEPARTMENTS?** NO

**eXPLAIN:**

CLICK HERE TO ENTER TEXT.

**IF YES, HAVE YOU DISCUSSED THIS PROPOSAL WITH ANYONE (FROM OTHER DEPARTMENTS AND/OR PROGRAMS) REGARDING THE IMPACT? WERE ANY AGREEMENTS REACHED?**

CLICK HERE TO ENTER TEXT.

**DO YOU ANTICIPATE THAT STUDENTS WILL BE TAKING ANY OF THE PREREQUISITES LISTED FOR THIS COURSE IN DIFFERENT PARTS OF THE SAME TERM?** NO

**IS ANY COREQUISITE LISTED ON THIS COURSE ALSO LISTED AS A COREQUISITE ON ITS PAIRED COURSE?** SELECT ANSWER.

eXAMPLE: CHM 2032 IS A COREQUISITE FOR CHM 2032L AND CHM 2032L IS A COREQUISITE FOR CHM 2032.

### SECTION III

**PROVIDE JUSTIFICATION FOR CURRICULUM ACTION (OTHER EXPLANATORY INFORMATION):**

This is a combination of the currently existing courses ast 2004 and ast 2004L. the proposed change is meant to simplify our offerings and serve as a test-case for offering all our lab science courses as “C” courses. also, this proposal is meant to alleviate students’ confusion as to whether or not they need to take ast 2003 or ast 2004 first (astronomy I and II, respectively, under the currently existing designation).

**NOTE:**

CHANGES FOR THE UPCOMING FALL TERM MUST BE SUBMITTED AND APPROVED NO LATER THAN THE FEBRUARY CURRICULUM COMMITTEE MEETING PRIOR TO THE START OF THE NEXT ACADEMIC YEAR. CHANGES DURING MID-SCHOOL YEAR ARE NOT ALLOWED. EXTREME CIRCUMSTANCES WILL REQUIRE APPROVAL FROM THE VICE PRESIDENT OF ACADEMIC AND STUDENT AFFAIRS TO BEGIN IN THE SPRING TERM. THE PROPOSED CHANGES MUST BE PRESENTED AND APPROVED BY THE SEPTEMBER CURRICULUM COMMITTEE PRIOR TO THE SPRING SEMESTER.

**TERM IN WHICH PROPOSED ACTION WILL TAKE PLACE:** FALL 2011

APPROVAL NEEDED FOR LOAD (CONTACT HOURS ≠ CREDIT HOURS):



**FACULTY ENDORSEMENTS:**PLEASE SEPARATE FACULTY MEMBERS WITH A COMMA (,)

I am the only faculty teaching this course at ESC. My expertise is in physics and astronomy and I believe this is the best approach in offering this course (and for that matter all lab science courses). --- Theo Koupelis

**DEPARTMENT CHAIR / PROGRAM COORDINATOR ENDORSEMENT:**

1/12/2011



**ASSOCIATE / ACADEMIC DEAN ENDORSEMENT:**

1/12/2011



**STUDENT ASSESSMENT COMMITTEE CHAIR ENDORSMENT:**

1/21/2011



**DISTRICT DEAN OF INSTRUCTION ENDORSEMENT:**

1/21/2011



AFTER REVIEWING AND SIGNING THIS PROPOSAL, THE DISTRICT DEAN WILL RETURN THE PROPOSAL TO THE DEPARTMENT CHAIR OR PROGRAM COORDINATOR WILL SUBMIT THE PROPOSAL TO THE VPASA OFFICE.

THE DEPARTMENT CHAIR/PROGRAM COORDINATOR WILL SEND THIS PROPOSAL ALONG WITH ANY OTHER PROPOSALS FROM HIS/HER DEPARTMENT BEING SUBMITTED FOR REVIEW BY THE CURRICULUM COMMITTEE TO THE STUDENT ASSESSMENT COMMITTEE FOR REVIEW. ONCE APPROVED BY THE STUDENT ASSESSMENT COMMITTEE, SUBMIT THE PROPOSAL(S) TO THE OFFICE OF THE VICE PRESIDENT OF ACADEMIC AND STUDENT AFFAIRS AT LEAST TWO FRIDAYS PRIOR TO THE NEXT SCHEDULED CURRICULUM COMMITTEE MEETING.

FOR MORE DETAILS, PLEASE REFER TO THE CURRICULUM COMMITTEE GUIDELINES, CURRICULUM PROCESS FLOW CHART AND THE CRITICAL DATES TABLE BY CLICKING CURRICULUM COMIITTEE ON THE FACULTY/STAFF LINK FROM THE EDISON HOMEPAGE (CLICK ON THE CURRICULUM PROCESS LINK).

REVISED: 8/25/10