## 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 2003C AStronomy: the solar system

### 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 the night sky, astronomical tools and methods, the historical development of our understanding of the universe, and the solar system. AST 2003C and AST 2004C may be taken in any order.

**GENERAL TOPIC OUTLINE:**

* Orientation to the night sky and units of measurement; the celestial sphere and star charts
* Observations of selected objects in the sky; star counting and sampling techniques
* Lunar and solar eclipses
* The Greek geocentric model; the apparent motion of the planets
* Kepler, Galileo, Newton and the heliocentric model; Kepler’s laws
* Light and the electromagnetic spectrum; the Doppler effect and spectroscopy
* Gravity
* Telescopes
* The Earth-Moon system
* The formation of planetary systems
* The planets in our solar system and their satellites
* Solar system debris: comets, asteroids, and meteoroids
* The Sun

**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** |
| **Identify the major celestial phenomena associated with the Sun, Moon, planets, and stars and analyze their relationship to the celestial sphere.** | Homework and/or quizzes and/or tests and/or group assignments and/or projects. |  |
| **Describe the ancient concepts of astronomy and show how they relate to modern day concepts.** | Homework and/or quizzes and/or tests and/or group assignments and/or projects. |  |
| **Use star charts to accurately locate stars and constellations by their right ascension and declination; compare astronomical and astrological predictions.** | Lab reports, exams and/or projects. |  |
| **Use sampling to approximate the number of stars seen by the naked eye in the night sky.** | Lab reports, exams and/or projects. |  |
| **Record the positions and sketch the motions of the Moon, Sun, Venus and Jupiter at specific times during the semester; formulate a model for their relative positions and motions.** | Lab reports, exams and/or projects. |  |
| **Compare and contrast the major historical contributions or early astronomers through Newton.** | Homework and/or quizzes and/or tests and/or group assignments and/or projects. | COM |
| **Identify and apply the relevant theories of gravitation and motion to predict and analyze planetary orbits.** | Homework and/or quizzes and/or tests and/or group assignments and/or projects. |  |
| **Use observational data to draw conclusions about the shapes of planetary orbits (such as the orbit of Mercury and Mars).** | Lab reports, exams and/or projects. | CT, QR, TIM |
| **Determine the mass of a celestial object (such as the Moon) by using Kepler’s laws and observational data (such as a satellite’s orbit around the Moon).** | Lab reports, exams and/or projects. |  |
| **Identify the various observational tools used in astronomy and categorize and differentiate the regions of the electromagnetic spectrum; identify gaseous elements by their spectral lines.**  | Homework and/or quizzes and/or tests and/or group assignments and/or projects and/or lab reports. |  |
| **Use the Doppler effect to determine the rotational period of a celestial object (such as Mercury).** | Lab reports, exams and/or projects. |  |
| **Construct a telescope and use it to make observations.** | Lab reports, exams and/or projects. |  |
| **Integrate relevant theories related to the Moon’s origin, its phases and its tidal effects on Earth.** | Homework and/or quizzes and/or tests and/or group assignments and/or projects. |  |
| **Compare and contrast the major physical characteristics of the Earth and Moon.** | Homework and/or quizzes and/or tests and/or group assignments and/or projects. |  |
| **Compare theories of formation of stars and their planetary systems.** | Homework and/or quizzes and/or tests and/or group assignments and/or projects. |  |
| **Use occultation data (such as from the Pluto-Charon system) to determine the diameter of each of the objects involved.** | Lab reports, exams and/or projects. |  |
| **Compare and contrast the interiors, surfaces, atmospheres (where applicable), and physical characteristics of the terrestrial planets.** | Homework and/or quizzes and/or tests and/or group assignments and/or projects. |  |
| **Compare and contrast the structure and physical characteristics of the Jovian planets.** | Homework and/or quizzes and/or tests and/or group assignments and/or projects. |  |
| **Compare and contrast the various objects comprising the solar system debris.** | Homework and/or quizzes and/or tests and/or group assignments and/or projects. |  |
| **Identify, describe, and compare the different layers in the Sun’s interior and atmosphere.** | Homework and/or quizzes and/or tests and/or group assignments and/or projects. |  |

### 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 2003 and ast 2003L. 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.

**EXCEPTION:**
COURSES PUBLISHED IN THE 2010-2011 CATALOG THAT ARE PENDING CURRICULUM APPROVAL WILL BE EFFECTIVE SPRING 2011.

**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