Honolulu Community College
General Education – DIVERSIFICATION DESIGNATION
Certification and Recertification

Application Form
Spring 2012

APPLICANT: Paul Sherard

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COURSE ALPHA and NUMBER: ASTR 110

COURSE TITLE: Survey of Astronomy

ESTIMATED NUMBER OF SECTIONS:
Fall: 1
Spring: 1

APPLICATION IS FOR:
☐ New Course ☐ Modified Course X Existing Course ☐ Re-designation

☐ Certification X Re-Certification. Date of last certification:

DIVERSIFICATION AREA DESIGNATION SOUGHT:
☐ DA (Arts)
☐ DB (Biological Sciences)
☐ DH (Humanities)
☐ DL (Literature and Language)
X DP (Physical Sciences)
☐ DS (Social Sciences)
☐ DY (Laboratory)
What percentage of the CONTENT of this course focuses on this diversification area?  100%

What percentage of CLASS MEETINGS focuses on this diversification area?  100%
1. Hallmarks and SLOs. Please explain how course-specific SLOs align with the diversification area’s hallmarks.

**DP.1 uses the terminology of the physical sciences:**
SLO1: Demonstrate a conceptual understanding of the basic science used to describe the observed universe and its evolution
SLO3: Recall important factual information relating to different astronomical objects/phenomena presented in the course

Students must learn basic terminology of astronomy in order to have a conceptual understanding of the subject matter. Some of the terminology that students must learn includes parallax, light years, white dwarfs, neutron stars, black holes, big bang, etc. Nearly every chapter of the text introduces students to new terminology of this sort.

**DP.2 involves knowledge and theories relating to processes in the physical sciences:**
SLO1: Demonstrate a conceptual understanding of the basic science used to describe the observed universe and its evolution
SLO4: Demonstrate a qualitative understanding of the current theoretical explanations used to explain observations
SLO5: Demonstrate an appreciation of selected astronomical topics covered in the course

This course involves the study of basic astronomy which involves an exploration of our present scientific knowledge of the universe and some of the basic theories that describe phenomena such as formation of the solar system, super novas, and expansion of the universe. Such phenomena are explained in terms of relevant theories.

**DP.3 demonstrates inquiry that involves observation/experiment and reasoning and mathematics:**
SLO2: Identify some of the common instruments currently used in the study of astronomy
SLO4: Demonstrate a qualitative understanding of the current theoretical explanations used to explain observations
SLO5: Demonstrate an appreciation of selected astronomical topics covered in the course

Astronomy is driven by observation. Students learn the well-known observations of astronomy along with some of the latest observations, many taking place right here in Hawaii. Students are encouraged to discuss observations that may be of interest to them. Students learn to use basics equations of physics to describe many astronomical phenomena. This includes ideal gas law, black-body radiation, and angular momentum. Students are introduced the mathematical equations which underlie the astronomical phenomena. Student learn how experimental evidence allows astronomers understand the mechanisms of the universe.
2. **Assessment strategies.** Explain assessment strategies you have used (or plan to use) to measure the degree to which students exit the course with the course-specific SLOs. If there are multiple sections of the course taught by different instructors, please discuss how assessment is (or will be) carried out across instructors.

Formative assessment is done with a course project which the instructor gives feedback directly to the student to guide them in the research/writing/other process in order to complete the process. This project counts 20% of their grade. Formative assessment is done during preparation for exams. Students may work together in groups for extra-credit points during such review sessions.

Summative assessment includes summative tests and graded homework problems. The summative tests are multiple choice and homework are a combination multiple choice and short-answer type problems. Such tests and assignments emphasize course SLOs. For instance:

(SLO1) Students must identify what physics is behind astronomical phenomena. For instance, star formation is understood in terms of gravitational forces.
(SLO2) Students learn of the various telescopes and spacecraft that are used too make observational observations. Attempts are made to explain recent instruments that have been developed.
(SLO3) Students, for instance, must understand how the different types of planets in the solar system were formed. This requires students to understand the difference between gas giants and terrestrial planets and which ones are which.
(SLO4) Some of the homework and exam problems that students will encounter involve simple math calculations. These calculations are based on formulas that are the basis of astronomical theories.
(SLO5) Students a project for the course that exhibits their knowledge of, and/or personal feelings toward, some aspect of astronomy.

3. **Assessment of assessment.** How have you used (or plan to use) the assessment findings to modify or improve this course? If there are multiple sections of the course taught by different instructors, please discuss how review of assessment results is (or will be) carried out across instructors.

Weekly online quizzes have been found to be useful. Students can then get immediate reinforcement as to how well they are understanding the material prior to a major exam. Along with homework, this can give the instructor an indication of how well students are keeping up with the material. As far as summative tests, confusing or overly difficult problems are can be culled from problem sets. Exam results can be compared semester to semester to see if there are drastic variations. In that case, how the subject matter may presented in a different way. Knowledge survey results can pinpoint weaknesses in student learning in certain areas.

At the end of the term, course evaluations are passed out where the students can assess the course instructor and content. The student evaluations give direct feedback to the course. There is only one instructor teaching this course per term.

If there are more than one instructor teaching the course they would meet to make sure the courses are congruent. It would be understood that similar or same questions are used for exams such that a proper comparison can be made across the board.
DIVERSIFICATION BOARD DECISION:

☑ Approved
Re-Certification Due: 5 2017

☐ Not approved
If not approved, reasons for disapproval:

Diversification Board Chair Signature: [Signature]
Date: 3 May 2012
COURSE SYLLABUS - ASTRONOMY 110

INSTRUCTOR: Kerry Tanimoto, Ph.D.
OFFICE: Bldg. 5, Rm. 102-A
PHONE: 845-9154
E-MAIL: kerryt@hawaii.edu

OFFICE HOURS: M 9:00-10:00; T 9:00-10:00, 12:00-1:00; W 9:00-10:00, 1:00-2:00

COURSE TITLE: Survey of Astronomy

HOURS PER WEEK: 3

PREREQUISITES: None
CO-REQUISITE: None

TEXT: Comins and Kaufmann, "Discovering the Universe", eighth edition

CATALOG DESCRIPTION
Survey of the nature of the astronomical universe for non-science majors, with emphasis on scientific method and development of scientific thought.

ARTICULATION
The course fulfills a DY (Physical Sciences) requirement for AA degrees at HCC and UHM.

STUDENT LEARNING OUTCOMES:
Upon the successful completion of ASTR 110, the student should be able to:
• Demonstrate a conceptual understanding of the basic science used to describe the observed universe and its evolution.
• Identify some of the common instruments currently used in the study of astronomy.
• Recall important factual information relating to different astronomical objects/phenomena presented in the course.
• Demonstrate a qualitative understanding of the current theoretical explanations used to explain observations.
• Demonstrate an appreciation of selected astronomical topics covered in the course.

SUBJECT MATTER:
ASTRO 110 is a survey course covering the nature of the astronomical universe for nonscience majors. The topics covered will include an introduction to the fundamental physics associated with astronomical phenomena, the solar system, stars, galaxies and cosmology.

LAULIMA:
All students enrolled in this course will have access to the additional information posted on LAULIMA at http://laulima.hawaii.edu. You will need your UH username and password to log in.
GRADING:
The boundaries separating letter grades in the final distribution are chosen based on the
standards I have established for the course and are not predetermined numerical values. The
work submitted for evaluation will count towards the final grade based the following:

Homework       10%
Quizzes         14%
Exam I          14%
Exam II         14%
Exam III        14%
Exam IV         14%
Course Project  20%

Note: The assignment of an "N" in lieu of a letter grade will not be an option for this course.

HOMEWORK POLICY:
Homework problems will be assigned for each chapter covered. The problems will come from
the end-of-chapter Review Questions and Advanced Questions. The problems are short-answer,
but there may be an occasional simple calculation required. The completed assignment will be
collected at the end of class on the announced due date. (No late assignments will be accepted
without a legitimate, verifiable excuse). After an assignment has been collected, the solutions
will be made available on LAULIMA.

QUIZZES:
Quizzes for each chapter covered will be administered on LAULIMA. Each quiz will be
multiple-choice and accessible only for a set period of time, after which that quiz can no longer
be taken.

EXAMS:
All exams will be multiple-choice and also closed book/notes. There is no cumulative final
exam for this course.

COURSE PROJECT:
You will be required to submit a project for the course that exhibits your knowledge of, and/or
your personal feelings toward, some aspect of astronomy. The type of project will be at your
discretion, but must reflect a reasonable amount of effort. Acceptable projects include, but are
not limited to, scientific reports, paintings, and short stories.

You will be required to submit a project proposal some time during the latter half of the semester
describing the subject and nature of your project. Precise deadlines for the submission of the
project proposal and the project itself will be announced at a later date.