UNIVERSITY OF HAWAII COMMUNITY COLLEGES

PROPOSAL TO INITIATE, MODIFY OR DELETE A COURSE

1. TYPE OF ACTION
   A. Addition  x  Regular  [ ] Experimental  [ ] Other ____________________________ (specify)
   B. Deletion  [ ]  
   C. Modification  [ ] in credits  [ ] in title  [ ] in number or alpha  [ ] in prerequisites  [ ] Other ____________________________ (specify)

2. NEW ALPHA, NUMBER AND TITLE  GG 166: PLANETARY GEOLOGY

3. CREDITS  3

4. OLD ALPHA, NUMBER AND TITLE

5. CREDITS

6. NEW CATALOG DESCRIPTION - Study of the Geology and Geophysics of earth-like planets and satellites in the solar system, with emphasis on understanding terrestrial geology in a broader, astronomical context. Topics covered: major processes determining structure and surface features of planets and techniques for remote sensing.

7. PREREQUISITES
   ASTRO 110 and GG 101 or consent of instructor

8. STUDENT CONTACT HOURS PER WEEK
   Lecture  3  Lecture/Lab  ____  Lab  ____
   Other (specify)  ____

9. PROPOSED DATE OF FIRST OFFERING
   Spring 1998

10. THIS COURSE  [ ] IS REQUIRED  x  IS AN ELECTIVE FOR THE WCC PROGRAM/CORE
   (Please specify)  __________
   [ ] CAN FULFILL Natural Science REQUIREMENT
   (Please specify)

11. THIS COURSE  [ ] INCREASES  [ ] DECREASES  [ ] MAKES NO CHANGE IN NUMBER OF CREDITS REQUIRED FOR THE PROGRAM/CORE

12. SIMILAR COURSES OFFERED ELSE WHERE:

   College(s):    Alpha, Number, Title:
   Leeward CC     GG 166  VOYAGE THROUGH THE SOLAR SYSTEM
   UH Manoa      GG 366  PLANETARY GEOLOGY
   UH Hilo       ASTR 384  COMPARATIVE PLANETOLOGY
   UH Hilo       GEOL 384  COMPARATIVE PLANETOLOGY

   THIS COURSE IS  x  APPROPRIATE FOR ARTICULATION  [ ] NOT YET APPROPRIATE FOR
   with  LCC/UH MANOA/UH HILO ARTICULATION
   (Provide details of existing or desired articulation (date, college(s), purposes, pre-major or major, etc.)

13. THIS COURSE IS  [ ] ALREADY ARTICULATED

14. REASON FOR INITIATING, MODIFYING OR DELETING COURSE OR OTHER PERTINENT COMMENT:
   An essential course for meeting WCC's ADP directive for establishing planetary astronomy as an area of academic excellence.

REQUESTED BY:  ____________________________  12-2-96
   Department Chairperson

APPROVED BY:  ____________________________  1/16/97
   Curriculum Committee  Date
   Faculty Senate  Date
   Dean of Instruction  Date
   Provost  Date

CCC#6100
(Amended for WCC use Sept. 1991)  Date
   Change recorded by Catalog Preparer
### Levels of Review of Course Proposals at WCC

<table>
<thead>
<tr>
<th>Signatures</th>
<th>Dates</th>
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<td>1. Subject Area (one or more instructors in the area)</td>
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Was this course discussed in a dept. mung. 11/12/96

Department Chairperson

Assistant Dean of Instruction

Curriculum Committee Chairperson
COURSE ARTICULATION FORM

ORIGINATING CAMPUS: Windward CC
COURSE ALPHA & NUMBER: GG 166
COURSE TITLE: Planetary Geology

DATE OF OUTLINE: (Fall or Spring) Spring Year 1998

(*** Representative outline, no multiple syllabi, please.)

1. Articulation committee to review this course:

A. Standing Committees
   Written Communication [ ]
   Mathematical & Logical Thinking [ ]
   World Civilizations [ ]
   Languages [ ]
   Arts & Humanities [ ]
   Natural Science [K]
   Social Science [ ]

B. Special Discipline/Program Committee [ ]

Specify discipline/program

Campus with which this course should be articulated (special articulation only):

UH Manoa [ ]
UH Hilo [ ]
Community Colleges [ ]
UH West Oahu [ ]

2. In the opinion of the originating campus, this course is equivalent to the following and/or meets the criteria for the indicated core categories:

<table>
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<th>Receiving Campus</th>
<th>Equivalent Course (Alpha and Number)</th>
<th>Core Category</th>
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<tbody>
<tr>
<td>UH Hilo</td>
<td>ASTR 384</td>
<td>11.C.GEOL/11.C.PHYS</td>
</tr>
<tr>
<td>UH Manoa</td>
<td>GG 366</td>
<td>NS2</td>
</tr>
<tr>
<td>UH West Oahu</td>
<td>Unknown</td>
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<tr>
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<tr>
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3. Notes

Revised 1/29/93
WOC FORM FOR TRANSFER COURSES
(To be completed for articulation with any 4-year UH campus)

Course GG 166 Submitted by JOSEPH CIOTTI Date 11-4-96

1. List the counter part to this course on any 4-year UH campus. Describe the relationship between the course and any related baccalaureate program area.
ASTR 384: UH HILO
GG 366 : UH MANOA

Qualifies for minor in Earth and Space Science

2. Is this course taught or accepted by major accredited colleges or universities? Give one or two examples.
UH Manoa
UH Hilo

3. Please attach a complete course outline, if you have not done so already. Your course outline should address all the items listed in the Guidelines for Course Outlines.
WCC FORM FOR NEW COURSE PROPOSALS

Course GG 166 Submitted by JOSEPH CIOTTI Date 11-4-96

1. How is this course related to the educational needs and goals of the College/Department/Community as reflected in the EDP? This course is essential for meeting WCC's ADP directive for establishing planetary astronomy as an area of academic excellence.

2. Provide details of any additional staff, equipment, facilities, library/media material, faculty preparation and other financial support that would be required to implement this course. (Include an estimate of the actual cost of supplies and equipment.) What has been done to provide for these additional costs for the proposed date of offering? Who will teach the course? This course will be team taught by the current Astronomy and Geology instructors. All AV and other materials are already available for existing courses. This course will be offered in alternating years until a new Physical Science instructor is hired at the college.

3. Is a similar course taught elsewhere in the UH system? Yes If yes, provide details of how this course differs from existing similar courses. Course content is essentially identical.

4. Is this course experimental and/or unique to Windward Community College? No If yes, provide rationale and details of its impact on the College curriculum.

5. Is a similar course taught on the upper division level by a 4-year UH college? Yes If yes, explain why this course is appropriate at the lower division or how it differs from its upper division counterpart. This course is similar to LCC's GG 166. GG 166 is a core science course at UH Manoa.

6. Please attach a complete course outline. Your course outline should address all the items listed in the Guidelines for Course Outlines.

7. If this course is numbered 100 or above or appropriate for transfer to a 4-year college, complete and attach WCC Form for Transfer Courses (blue). (See attached criteria for transfer courses.)

WOC 9/91
Windward Community College

OUTLINE OF COURSE OBJECTIVES

COURSE NAME: PLANETARY GEOLOGY
COURSE NUMBER: GG 166
COURSE CREDITS: 3 credits

CATALOG DESCRIPTION: Study of the geology and geophysics of earth-like planets and satellites in the solar system, with emphasis on understanding terrestrial geology in a broader, astronomical context. Topics covered: major processes determining structure and surface features of planets and techniques for remote sensing.

PREREQUISITES: ASTRO 110 and GG 101 or consent of instructor

ARTICULATION BY CAMPUS:
  WCC: Natural Sciences: Group 2—Physical Sciences (NS2)
  UH Manoa: Natural Sciences: Group 2—Physical Sciences (NS2)
  UH Hilo: Natural Sciences—Physics (II.C.Phys)
  West Oahu: Natural Sciences (NS)

TEXTBOOKS AND OTHER ASSIGNED INSTRUCTIONAL MATERIALS:
  REQUIRED TEXT: The New Solar System
                  by J. Kelly Beatty and Andrew Chaikin

ACTIVITIES REQUIRED AT SCHEDULED TIMES OTHER THAN CLASS TIMES:
None

<table>
<thead>
<tr>
<th>INSTRUCTORS</th>
<th>Dr. Joseph Ciotti</th>
<th>Dr. Floyd McCoy</th>
</tr>
</thead>
</table>

<table>
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<tr>
<th>OFFICE</th>
<th>Iolani 106</th>
<th>Haloa 108</th>
</tr>
</thead>
</table>

| OFFICE PHONE | 235-7319 | 235-7316 |

OFFICE HOURS: Posted on office door

EFFECTIVE DATE: Spring 1997
GG 166: PLANETARY GEOLOGY
SUPPLEMENTARY INFORMATION

A. Goals of the Course

The goals of the course are:

1. To provide the student with an in-depth astronomical and geological understanding of the earth-like objects in the solar system.
2. To provide the student with an understanding of the techniques of remote sensing of objects in the solar system.
3. To cultivate and enhance the student's ability to reason by applying the scientific method.
4. To promote greater student appreciation and awareness of the role of astronomy and space science in our society and world in general.

B. Objectives of the Course

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

1. discuss the general characteristics of objects in the solar system
2. describe the origins of our solar system.
3. discuss the nature of the sun and its influence on planetary systems.
4. outline evolution of planetary surfaces and how this evolution is determined.
5. discuss the geological features, geochemistry and geophysics of terrestrial worlds.
6. discuss comparative planetology from a geological perspective, including volcanic activity.
7. describe the effects and implications of collisional impacts on planetary surfaces.
8. compare and contrast terrestrial and jovian planets and moons.
9. compare and contrast comets and asteroids.
10. classify meteorites, discuss their mineral content and make inferences for crustal and internal structures of their parent bodies.
11. summarize the findings of manned and unmanned space flight.
12. discuss the evidence and validity for extraterrestrial life in the solar system.
13. identify the appropriate instruments, detectors and space probes used by astronomers and space scientists to explore the solar system.
14. discuss the techniques of remote sensing in planetary exploration.
15. discuss atmospheric influences on planetary surfaces.
C. Expectations of Students

Success in this course will be enhanced by:

1. a positive, inquiring attitude toward science
2. setting aside adequate time for studying and working problems
3. reading the text carefully and making notes and use of handouts and other learning materials whenever necessary
4. seeking assistance from the instructor
5. class attendance and responsibly obtaining all assignments and/or changes to the course syllabus
6. keeping abreast with or ahead of the syllabus

D. Mode of Instruction

Lecture/Discussion: The initial portion of each lecture period is used to discuss and clarify any questions from the preceding class meeting. The remaining portion is used to present and discuss new materials. Demonstrations and audio-visual materials are included in lectures.

E. Method of Evaluation

Evaluation of the successful completion of the objectives of this course will be determined by grades received on 2 exams and a final exam.

Each of the 2 EXAMS is worth 50 points. The FINAL EXAM is worth 100 points. All tests are to be taken within the classroom environment; all are closed-book/closed notes. Each of the two exams includes all material covered prior to that exam date; the Final Exam is cumulative and includes all material covered in the course.

Test dates are listed on the course syllabus. The student is responsible for keeping abreast with any changes in syllabus which are announced in class. Unless permission is granted by the instructor, all tests must be completed and submitted to the instructor at the specified date and time.
Each letter grade and its respective level of achievement is provided in the following table:

**Letter Grade**  **Definition**

A  90% - 100% of cumulative points possible
B  80% - 89% of cumulative points possible
C  70% - 79% of cumulative points possible
D  60% - 69% of cumulative points possible
F  below 60% of cumulative points possible

I  Incomplete: This temporary grade given at the instructor's option when a student has failed to complete a small part of a course because of circumstances beyond the student's control. All required work must be completed by the last day of instruction of the succeeding semester.  

*The Cr/NC option must be declared by the end of the 10th week of classes. Written consent of instructor is required for this option.*

Cr  Achievement of objectives at the C level or higher.
NC Achievement of objectives at less than C level. (Formal grade)
N  Achievement of objectives at less than C level. (Optional instructor's grade)
W  Official withdrawal after the third week of a 16-week course and prior to the end of the 10th week. If a student officially withdraws by the end of the 3rd week of a 16-week course, the record of registration in this course will not appear on the student's transcript.

**F. Other Information**

1. If a student is unable to take an exam at the scheduled time, the student is responsible for notifying the instructor of the situation and reason(s) prior to the exam date. The student is responsible for requesting a make-up exam. An appropriate scoring penalty may be assigned to this make-up at the instructor's discretion. The student may be required to fulfill additional requirements as specified by the instructor in order to qualify for a make-up test.

2. Students are encouraged to visit WCC's AEROSPACE LAB (located in Hale 'Imiloa). Besides a large collection of astronomy resource materials, there are displays of space related items and a hands-on physical science museum. Students are also encouraged to visit the Hawaii Institute of Geophysics & Planetology in the basement of Sinclair Library at UH-Manoa.

3. A student can determine how his/her current grade during any time of the semester by dividing his/her cumulative score by the cumulative points possible and converting into a percentage and referring to the table of Letter Grades.

4. Any student wishing to be informed of his/her semester grade in advanced of the official mailing of report cards should provide the instructor a stamped, self-addressed postcard or envelope on the day of the Final Exam.
### GG 166: Planetary Geology
#### Spring 1997

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Date</th>
<th>Day</th>
<th>Topic</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Jan 14</td>
<td>Tu</td>
<td>Inventory &amp; characteristics of the Solar System</td>
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<tr>
<td>2</td>
<td>16</td>
<td>Th</td>
<td>Astrophysics of the Sun</td>
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<tr>
<td>3</td>
<td>21</td>
<td>Tu</td>
<td>Origin of the Solar System</td>
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<tr>
<td>4</td>
<td>23</td>
<td>Th</td>
<td>Evolution of planetary surfaces</td>
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<tr>
<td>5</td>
<td>28</td>
<td>Tu</td>
<td>Earth: Interior structure and magnetosphere</td>
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<td>6</td>
<td>30</td>
<td>Th</td>
<td>Earth: Plate tectonics</td>
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<td>7</td>
<td>Feb 4</td>
<td>Tu</td>
<td>Earth: Earthquakes &amp; volcanism</td>
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<td>8</td>
<td>6</td>
<td>Th</td>
<td>Earth: Impact craters, volcanism and the K/T boundary</td>
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<td>9</td>
<td>11</td>
<td>Tu</td>
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<td>10</td>
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<td>Th</td>
<td>The Moon: Geomorphology and surface geology</td>
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<td>11</td>
<td>18</td>
<td>Tu</td>
<td>The Moon: Apollo mission and findings</td>
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<td>Th</td>
<td>The Moon: Analysis of lunar rocks &amp; regolith</td>
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<td>13</td>
<td>25</td>
<td>Tu</td>
<td>The Moon: Its Origin and evolution</td>
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<td>Mercury: Geomorphology &amp; results from Mariner 10</td>
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<td>15</td>
<td>Mar 4</td>
<td>Tu</td>
<td>Venus: Findings from early Soviet &amp; American missions</td>
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<td>Th</td>
<td>Venus: Radar results from Magellan</td>
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<td>11</td>
<td>Tu</td>
<td>Mars: Mariner and Viking findings</td>
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<td>Th</td>
<td>Martian terrain: Erosion from water, wind &amp; volcanism</td>
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<td>19</td>
<td>18</td>
<td>Tu</td>
<td>Martian meteorites &amp; evidence for extraterrestrial life</td>
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<td>Asteroids: general characteristics</td>
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<td>Asteroids: Results from radar and space probes</td>
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<td>8</td>
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<td>Meteoroids &amp; Meteorites: Chemical classification &amp; mineralogy</td>
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<td>Comets: Structure and chemical composition</td>
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<td>Halley's Comet: Results from space probes</td>
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<td>May 1</td>
<td>Th</td>
<td>Moons of Uranus &amp; Neptune</td>
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<td>31</td>
<td>6</td>
<td>Tu</td>
<td>Pluto-Charon &amp; Future Exploration</td>
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**Final Exam:** TUESDAY, MAY 13 from 8:15 - 10:05 am