Purpose

The purpose of General Education (GE) certification at Hawai‘i Community College (HawCC):

- ensures consistent implementation of HawCC’s General Education Philosophy; and
- ensures that certified courses provide evidence of academic rigor and consistency with regard to the course outline—course objectives, student learning outcomes and course description—by meeting stated General Education Learning Outcome descriptors.

The purpose of the General Education Committee (GEC) is to review applications in order to designate courses to be part of HawCC’s General Education curriculum.

Criteria for Certifying Courses for General Education

All HawCC courses that are certified as GE must: (#1 & #2 are from Sept. 23, 2011 Senate-approved, as amended, resolution)

1. have a primary designation and at least three secondary designations, one of which is Critical Thinking and one of which is Critical Reading.
   a. **Primary designation:**
      i. Courses numbered 100 or higher:
         Course learning outcomes and course objectives must support all descriptors of the primary designation except for those in the Communication (#1) and Areas of Knowledge (#7) Learning Outcomes. For those designations, all descriptors for a subcategory must be met. (amended by Senate, Jan. 27, 2012)
      ii. Courses numbered lower than 100:
         Course learning outcomes and course objectives must meet all those descriptors designated as essential on the HawCC General Education Student Learning Outcome Descriptors of the primary designation.
   b. **Secondary designations:**
      i. **Critical Thinking:**
         All certified courses must have at least one course learning outcome and course objective that supports a Critical Thinking descriptor or have evidence that the content taught relies on the use of at least one (1) Critical Thinking descriptor.
      ii. **Critical Reading:**
         All certified courses must have at least one course learning outcome and course objective that supports a Critical Reading descriptor or have evidence that the content taught relies on the use of at least one (1) Critical Reading descriptor.
      iii. In addition all certified courses must have at least one course learning outcome and course objective that supports at least one other GE learning outcome designation descriptor, i.e. not the primary designation or Critical Thinking or Critical Reading.

2. include rigorous reading, written, or quantitative assignments (as appropriate) that evaluate the student learning outcomes.

Procedures

1. Complete the HawCC Course Outline. Include in #8 (Course Topics) details in outline format
2. Complete Attachment A with the signatures of all tenure-track faculty in the discipline (ie, those who teach or may teach the subject). Signatures indicate support for course being submitted for GE certification.
3. Submit the Course Outline with Attachment A to the Chair, General Education Committee
4. See the Signature Page of Attachment A (Section H.) for additional instructions.
1. **Course Description:**
   This is an introductory course in plant biology. Topics include cell structure and function, plant tissues and organs, reproduction and genetics.

2. **Number of Credit Hours:** 3

3. **Course Prerequisites and Concurrency:** (Please check the box if the prerequisite may also be taken in the same semester as the proposed course.)
   - a. "C" or better in ENG 21 or "C" or better in ENG 22 or "B" or better in ENG 51 or placement in ENG 100 or placement in ENG 102
   - b. 
   - c. 
   - d. 

4. **Course Corequisites:** (Course that must be taken in the same semester as the proposed course.)
   - a. BOT 101L

5. **Recommended Preparation:**

6. **Student Learning Outcomes:**
   - a. Able to recognize the basic molecular and cellular components of plants
   - b. Demonstrate knowledge of basic concepts of plant morphology, anatomy, physiology, taxonomy, and developmental biology.
   - c. Able to distinguish among phylogenetic groups based on their vegetative and reproductive characteristics.
   - d. Demonstrate knowledge of the basic concepts of plant ecology and the socio-economic importance of plants to humans.

7. **Course Objectives**
a. Recognize that plants are composed of molecules and molecules are composed of atoms.
b. Understand basic cellular components and their functions.
c. Be familiar with the structure and function of different plant cells and tissue types.
d. Know the major plant organs and how they develop.
e. Identify plant structures based on their morphological and anatomical characteristics.
f. Demonstrate an understanding of basic plant growth, reproduction and metabolism.
g. Recognize plant phylogenetic groups based on their vegetative and reproductive characteristics.
h. Demonstrate and understanding of how plants interact with their biotic and abiotic surroundings.
i. Be familiar with the socio-economic importance that plants provide to humans.

8. Course Topics:
I. Dependence of human and animals on plants and diversification of plant study
   a. Principles of matter:
      - Atoms,
      - Molecules,
      - Compounds and energy transfer
   III. The plant cell:
      - Structure, function and reproduction.
   IV. Plant structure and development:
      - Tissues -
   V. Plant Organs
      - Roots
      - Stems
      - Leaves
   VI. Water in Plants:
      - Transpiration
      - Nutrients required for growth
      - Translocation.
   VII. Plant metabolism:
      - Photosynthesis
      - Respiration
   VIII. Plant growth and reproduction:
      - Primary and secondary growth
      - Hormones
      - Sexual and asexual reproduction
   IX. Classification of plants and plant like organisms;
      - Kingdom concept
      - Binomial system of nomenclature.
   X. Meiosis and alternation of generations
      - Plant life cycles
      - Gametophyte and sporophyte generations
   XI. Kingdom Protista
      - Algae phylla: Chlorophyta, Rhodophyta, Chromophyta, Dinophyta
   XII. Kingdom Plantae
      - Bryophytes,
      - Ferns and lower vascular plants
      - Gymnosperms
      - Angiosperms.
   XIII. Flowers, Fruits and Seeds: monocots vs dicots, pollination, seed dispersal
   XIV. Plants and civilization: plant domestication and economic importance of plants
   XV. Plant ecology: populations, communities, ecosystems and biomes

Adopted: June 1, 2006
CRITERIA FOR TRANSFER COURSES (Attach. III/IV, CCCM 6100)

Final decisions as to the academic level of a course should generally rest with the professional judgment of the faculty. Each of the items below indicates an area which should be considered in arriving at this judgment, although not all items pertain to all courses. It is important that judgments not be made by the "least common denominator" approach: the standard to keep in mind is the "typical" college transfer course, rather than the most borderline courses now accepted within the system.

1. Rate of progress expected of students.
High schools and colleges typically differ rather substantially in the quantity of material taught in a semester. The course in question should be compared with high school and college courses in related areas.

2. Basic skills (reading, writing and analytical) needed for success in the course.
The concern here is with the skill levels required of students rather than the level of material in the class. To be successful in most freshman transfer courses, a student must have a minimum of 10th grade skill level in the areas relevant to the course.

3. Amount and level of reading, writing or other independent work required.
As a rule of thumb, much of the reading material for a freshman level course should be at 12th or 13th grade level. Sometimes sophisticated ideas are presented in a simple writing style (such as the writing of Campus). In these cases, the level of the audience for which the materials were developed or who normally read them may be a useful indicator.

College courses usually differ from high school courses in the amount of reading, writing or other independent work required of students. The long standing rule of thumb for lecture classes is that students should spend two hours studying outside of class for every hour in class. For laboratory classes, a rule of thumb is that the student should spend three hours per week for each credit assigned to the class, with the student working independently or in groups for a substantial portion of the lab.

4. Amount and level of quantitative and logical reasoning required.
Where the course involves use of mathematics, a minimum of one year of high school algebra, or its equivalent, as background for the course would be required for transfer courses, (In the field of mathematics itself, courses through second year algebra are non-transfer.) Courses should also be examined for use of logical principles.

5. Conceptual level of the course.
Transfer courses generally stress theory, principles and concepts more than do non-transfer courses. They also move at least somewhat beyond recognition, recall and application to synthesis, analysis and understanding, although a major goal of many introductory transfer courses is mastery of the basic language and concepts of the discipline. Where a course focuses on teaching specific skills, it may be transfer level if it emphasizes the skills as applications of basic underlying principles and devotes considerable attention to understanding of those principles.

6. Background knowledge in related subject matter expected of students entering the course.
If a course is based on the expectation that-students will have completed normal high school courses in related areas it may be a transfer course (e.g., high school physics as an expected preparation for a technical program). If the course has as a prerequisite, another course, which is itself transferable, and if the knowledge from the prior course is utilized in the course in question, the course should be transferable.
7. **Level of mastery expected of students.**
When the competencies attained in a course are sufficient to prepare students for further study in a related baccalaureate program, the course may be transferable. The relationship between the subject matter of the course and any related baccalaureate program area should be examined.

8. **Is there a counter-part to this course on any four-year campus in the University system?**
Although generally a course taught on four-year campuses would automatically be numbered 100 or above, it should be examined against other criteria as well. It is possible that some courses offered on four-year campuses should not be there. If such a case arises, we should challenge the appropriateness of that course on the four-year campus rather than blindly following their lead.

9. **Is this course taught at or accepted by major accredited mainland colleges or Universities?**
As in #8, the course should be examined against other criteria as well. Practice elsewhere is not sufficient justification for our numbering decisions.
### A. Course Information

<table>
<thead>
<tr>
<th>Course Alpha</th>
<th>Course Number</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOT</td>
<td>101</td>
<td>General Botany</td>
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</tbody>
</table>

### B. Effective Semester & Year

- **Semester:** Fall 2012

### C. General Education Student Learning Outcome

- **Select:** 7. Areas of Knowledge - Natural Sciences

### D. Course Objectives and Student Learning Outcomes

<table>
<thead>
<tr>
<th>GE Student Learning Outcome Descriptors</th>
<th>Course Objectives (may provide supporting explanation as needed, after each one)</th>
<th>Course student learning outcomes (provide all that support the GELO descriptor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Areas of Knowledge - Natural Sciences</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. use the basic terminology of theories, structures or processes of the natural sciences.</td>
<td></td>
<td>a. Able to recognize the basic molecular and cellular components of plants.</td>
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<tr>
<td>b. demonstrate an understanding of the theories of the natural sciences, specifically in the physical or biological sciences</td>
<td></td>
<td>c. Able to distinguish among phylogenetic groups based on their vegetative and reproductive characteristics.</td>
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</tbody>
</table>

- c. Be familiar with the structure and function of different plant cells and tissue types.
- d. Know the major plant organs and how they develop.
- e. Identify plant structures based on their morphological and anatomical characteristics.
- g. Recognize plant phylogenetic groups based on their vegetative and reproductive characteristics.
- a. Recognize that plants are composed of molecules and molecules are composed of atoms.
- b. Understand basic cellular components and their functions.
- f. Demonstrate an understanding of basic plant growth, reproduction and metabolism.
- h. Demonstrate and understanding of how plants interact with their biotic and abiotic surroundings.
- i. Be familiar with the socio-economic importance that plants provide to humans.
- b. Demonstrate knowledge of basic concepts of plant morphology, anatomy, physiology, taxonomy, and developmental biology.
- d. Demonstrate knowledge of the basic concepts of plant ecology and the socio-economic importance of plants to humans.
c. use the scientific method--including observation, experimentation and scientific reasoning

E. Textbook(s) and/or other written material (can include electronic material):

a. List the textbook(s) and/or other written material to be used. (If no textbook is use, so state.) Indicate approximate portion of text to be used, if less than 75%.


b. Identify grade level of textbook(s) and/or other written material. Publishers can provide grade level for textbooks.

Freshman College

F. List specific rigorous assignments/activities that are commonly required to evaluate student learning for all sections taught of this course. Identify the category by marking X in all that apply--reading, writing, quantitative, or a combination. HawCC uses the following to define academic rigor:

- **Reading**—Provide a description of rigorous student engagement in the critical reading process. For example: quantify number of pages or percentage of textbook read (written at 12th/13th grade level), provide the number of scholarly articles read (with a minimum of 5 bibliographic references per article), or describe the nature and length of other assigned readings.

- **Writing**—Provide a description of rigorous student engagement in the writing process. For example: give the number of pages written over the semester or describe the nature of the paper--research, observation, journal, etc.

- **Quantitative reasoning**—Provide a description of rigorous student engagement in the quantitative reasoning process. For example: provide the number and nature of mathematical problems (at least above one year of high school algebra); describe the extent and nature of data collection and analysis or mapping projects.

Describe assignments/activities that show rigorous student engagement--include assignments/activities of same type in one row—(mark X for all that apply—reading, writing, quantitative):
G. Secondary Designations:

- For the first of 3 required General Student Learning Outcome designations--critical reading--select at least one descriptor that the course supports, copy it into the table below and include either a supporting course objective and supporting course student learning outcome, or content evidence.

| a. determine the meaning of words through context clues. |

Critical Reading - Read critically to synthesize information to gain understanding enables a student to...

| a. determine the meaning of words through context clues. |

**Supporting Course objective and Supporting Course SLO:**

| g. Recognize plant phylogenetic groups based on their vegetative and reproductive characteristics |

| c. Able to distinguish among phylogenetic groups based on their vegetative and reproductive characteristics. |
For the second of 3 required General Student Learning Outcome designations—critical thinking—select at least one descriptor that the course supports, copy it into the table below and include either a supporting course objective and supporting course student learning outcome, or content evidence.

**f. apply problem-solving techniques and skills, including the rules of logic and logical sequence.**

### Critical Thinking - Make informed decisions through analyzing and evaluating information enables a student to...

<table>
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<td>f. Demonstrate an understanding of basic plant growth, reproduction and metabolism.</td>
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<td>g. Recognize plant phylogenetic groups based on their vegetative and reproductive characteristics</td>
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<tr>
<td>h. Demonstrate and understanding of how plants interact with their biotic and abiotic surroundings.</td>
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<tr>
<th>b. Demonstrate knowledge of the basic concepts of plant morphology, anatomy, physiology, taxonomy, and developmental biology.</th>
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<tbody>
<tr>
<td>c. Able to distinguish among phylogenetic groups based on their vegetative and reproductive characteristics.</td>
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For the third of 3 required General Student Learning Outcome designations—anything other than the primary designation, critical reading and critical thinking—select at least one descriptor that the course supports, copy it into the table below and either a supporting course objective and supporting course student learning outcome, or content evidence.

### 7. Areas of Knowledge - Social Sciences

**Areas of Knowledge - Social Sciences - Utilize methods, perspectives and content of selected disciplines in the natural sciences, social sciences, and humanities enables a student to...**
d. use the basic terminology of theories, structures or processes in the social sciences
e. demonstrate an understanding of the theories of the social sciences.
f. systematically study human behavior using research methods of the social sciences.

<table>
<thead>
<tr>
<th>Supporting Course objective and Supporting Course SLO:</th>
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<tbody>
<tr>
<td>Social Science: e. demonstrate an understanding of the theories of the social sciences.</td>
</tr>
<tr>
<td>i. Be familiar with the socio-economic importance that plants provide to humans.</td>
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<tr>
<th>OR Content evidence (i.e., assignments/activities)</th>
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<tbody>
<tr>
<td>In lecture the topics of plant domestication and agriculture are discussed as well as theories of plant evolution and global warming and their impacts on human society.</td>
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- Optional--additional secondary designations beyond the required 3 may be chosen. Please write in the additional General Education Learning Outcome, the descriptor and the supporting evidence for each.