

Resolution to adopt updated General Education Student Learning Outcomes for Science

Original statement from the General Education Implementation Guidelines for Science (ratified by the Senate 1996). *Students are required to complete two courses in the physical or biological - sciences. This may be accomplished in two ways:*

- 1) *By completing two courses with laboratories in the basic or applied sciences;*
- 2) *By completing one approved course in the applications of scientific knowledge, plus one course with a lab in the basic or applied sciences.*

DEFINITIONS AND EXPLANATIONS

- 1) *A laboratory course in the applied physical or biological sciences brings basic knowledge to bear on the solution of practical problems in engineering, medicine, agriculture, forestry, and other fields for which natural science forms the foundation. Normally applied science courses require one of the basic natural sciences (biology, physics, chemistry, geology) as a prerequisite, and carry at least 4 degree credits.*
- 2) *A course in the applications of scientific knowledge has the following attributes:*
 - a) *it focuses on one or more basic or applied natural sciences*
 - b) *it includes significant blending of presently accepted science with its application in common situations;*
 - c) *it discusses both the applications and limitations of the relevant scientific methodology;*
 - d) *it includes as a major component of the course the observation of natural phenomena coupled with the gathering of data and its quantitative analysis, and its interpretation in an expository format;*

its overall focus is on guiding students towards the scientific literacy necessary for modern life rather than on training future science professionals.

The General Education Committee recommends that the Faculty Senate adopt and ratify the following updated and streamlined set of student learning outcomes for the Science general education category. This change creates student learning outcomes that are clear, assessable, and understandable by students.

Proposed student learning outcomes and preamble:

General Education Student Learning Outcomes Science

Preamble

Students are required to complete two courses in the physical or biological - sciences. This may be accomplished in two ways:

- 1) By completing two courses with laboratories in the basic or applied sciences;
- 2) By completing one approved course in the applications of scientific knowledge, plus one course with a laboratory in the basic or applied sciences.

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- 2) A course in the applications of scientific knowledge has the following attributes:
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 - c) it discusses both the applications and limitations of the relevant scientific methodology;
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its overall focus is on guiding students towards the scientific literacy necessary for modern life rather than on training future science professionals.

A science course, laboratory or applied, will have the following student outcomes embedded within the course. The outcomes are based on "The Nature of Science" as published in "Science for All Americans Online" at <http://www.project2061.org/publications/sfaa/online/chap1.htm> (sponsored by American Association for the Advancement of Science (AAAS)). Retrieved February 2012.

Student Learning Outcomes Students completing the general education area of Science will be able to:

- 1) Explain what makes knowledge scientific, i.e., "...things and events in the universe occur in consistent patterns that are comprehensible through careful, systematic study." (AAAS)
- 2) Demonstrate the appreciation that scientific knowledge is subject to change as new observations and interpretations challenge current understanding.
- 3) Recognize that valid scientific information is durable, i.e., it is continually affirmed as new observations are made.
- 4) Recognize the limitations of science, i.e., science cannot provide answers to all questions.
- 5) Perform scientific inquiry including aspects of the scientific method, such as observation, hypothesis, experiment, and evaluation. *Note: Covered in laboratory science courses but not necessarily in applied science courses.*