

# Hands-On Science

## Proposal and Evaluation Procedures

**Required Proposal Materials:** In order for a course proposal to be evaluated for this General Education category, the Subcommittee must be provided with:

- Completed Course Information Worksheet
- Course Syllabus
- Completed Criteria Worksheet

**Course Proposals will be evaluated based on:**

- Course Description & Objectives
- Course Focus
- Evidence of Student Learning

**CRITERIA WORKSHEET: HANDS-ON SCIENCE**  
(to be completed by faculty applicant)

**REQUIRED OF ALL COURSES**

Criteria: Students will...	Evidence of Student Engagement	Assessment Types	Description
Demonstrate the ability to complete hands-on science by making observations, understanding fundamental scientific design, generating and analyzing data using quantitative tools, use abstract reasoning to interpret data and mathematical models or formula, test scientific hypotheses Hands-on aspects of course design may include traditional laboratory-based experiences, field experiences, studio work, recitations, clinical application, or other appropriate experiences for the setting/discipline	150 word limit		150 word limit

**QUANTITATIVE REASONING: COMPLETE AT LEAST THE FIRST THREE OF THE FOLLOWING**

Criteria: Students will...	Evidence of Student Engagement	Assessment Types	Description
a) Identify and use empirical evidence to describe/explain natural phenomena through application of a scientific method.	150 word limit		150 word limit
b) Identify and use empirical evidence to predict natural phenomena through application of a scientific method.	150 word limit		150 word limit
c) Use scientific principles to design strategies to answer open-ended questions.	150 word limit		150 word limit
d) Use scientific principles to evaluate strategies to answer open-ended questions.	150 word limit		150 word limit

a) Describe some of the major concepts in science to explain natural phenomena.	150 word limit		150 word limit
b) Evaluate the quality of scientific information on the basis of methods used to generate it.	150 word limit		150 word limit

c) Use qualitative and/or quantitative analyses

**CRITERIA CHECKLIST: SOLUTIONS THROUGH SCIENCE**  
(to be completed by evaluator)

**REQUIRED OF ALL COURSES**

Criteria: Students will...	Course Meets Criteria?	Comments
Demonstrate the ability to complete hands-on science by making observations, understanding fundamental scientific design, generating and analyzing data using quantitative tools, use abstract reasoning to interpret data and mathematical models		

SCIENTIFIC REASONING: COMPLETE AT LEAST THE FIRST FIVE OF THE FOLLOWING		
Criteria: Students will...	Course Meets Criteria?	Comments
a) Identify and use empirical evidence to describe/explain natural phenomena through application of a scientific method.	Yes No Unclear	
b) Identify and use empirical evidence to predict natural phenomena through application of a scientific method.	Yes No Unclear	
c) Use scientific principles to design strategies to answer open-ended questions.	Yes No Unclear	
d) Use scientific principles to evaluate strategies to answer open-ended questions.	Yes No Unclear	
e) Use scientific principles to implement strategies to answer open-ended questions.	Yes No Unclear	
f) Critically evaluate scientific arguments and identify the limits of scientific knowledge.	Yes No Unclear	
g) Explore complex questions and identify how they impact or are impacted by external issues (political, economic, or ethical).	Yes No Unclear	
h) Solve or demonstrate resolutions to complex questions or problems requiring the application of scientific concepts.	Yes No Unclear	
i) Communicate scientific ideas effectively.	Yes No Unclear	

Total Number of SCIENTIFIC REASONING  
Criteria Met by Course Proposal:

19

KNOWLEDGE OF THE PHYSICAL WORLD: COMPLETE AT LEAST THREE (INCLUDING THE FIRST TWO) OF THE FOLLOWING		
Criteria: Students will...	Course Meets Criteria?	Comments
a) Describe some of the major concepts in science to explain natural phenomena.	Yes No Unclear	
b) Evaluate the quality of scientific information on the basis of methods used to generate it.	Yes No Unclear	
c) Use qualitative and/or quantitative analyses to draw inferences or conclusions from data.	Yes No Unclear	
d) Explore complex questions and identify how they impact or are impacted by external issues (political, economic, or ethical).	Yes No Unclear	

EVALUATION RUBRIC FOR GENERAL EDUCATION COURSE PROPOSALS  
(to be completed by evaluator)

**Hands-On Science:  
experiential laboratory-based science**

Student Learning Outcomes

**Quantitative Reasoning:** Students will be able to interpret models and solve quantitative problems from different contexts with real world relevance; understand and create reasonable arguments supported by quantitative evidence; and clearly communicate those arguments in effective formats (e.g., using words, tables, graphs, and mathematical equations)

**Scientific Reasoning:** Students will be able to identify and use empirical evidence to describe, explain, and predict natural phenomena through application of the scientific method; and use scientific principles to design, evaluate, and implement strategies to answer open-ended questions.

**Knowledge of the Physical World:** Students will be able to describe some of the major concepts in science to explain natural phenomena; and evaluate the quality of scientific information on the basis of methods used to generate it.

**COURSE DESCRIPTION & OBJECTIVES**

Based on the course syllabus, assign an appropriate rating to course description and objectives in relation to the required Student