

Solutions Through 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 in three areas:

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

CRITERIA WORKSHEET: SOLUTIONS THROUGH SCIENCE
(to be completed by faculty applicant)

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

Criteria: Students will...	Evidence of Student Engagement	Assessment Types	Description
a) Interpret models and solve quantitative problems from different contexts with real world relevance.	<i>150 word limit</i>		<i>150 word limit</i>
b) Create reasonable arguments supported by quantitative evidence (e.g., using words, tables, graphs, and/or mathematical equations).	<i>150 word limit</i>		<i>150 word limit</i>
c) Communicate reasonable arguments supported by quantitative evidence (e.g., using words, tables, graphs, and/or mathematical equations).	<i>150 word limit</i>		<i>150 word limit</i>
d) Demonstrate a variety of mathematical principles and the methods of data analysis.	<i>150 word limit</i>		<i>150 word limit</i>
e) Students will apply or demonstrate the use of quantitative analyses in a variety of different contexts to construct explanations and/or solve problems.	<i>150 word limit</i>		<i>150 word limit</i>

SCIENTIFIC REASONING: COMPLETE AT LEAST THE FIRST FIVE OF THE FOLLOWING

Criteria: Students will...	Evidence of Student Engagement	Assessment Types	Description
a) Identify and use empirical evidence to <i>describe/explain</i> natural phenomena through application of a scientific method.	<i>150 word limit</i>		<i>150 word limit</i>
b) Identify and use empirical evidence to <i>predict</i> natural phenomena through application of a scientific method.	<i>150 word limit</i>		<i>150 word limit</i>
c) Use scientific principles to <i>design</i> strategies to answer open-ended questions.	<i>150 word limit</i>		<i>150 word limit</i>
d) Use scientific principles to <i>evaluate</i> strategies to answer open-ended questions.	<i>150 word limit</i>		<i>150 word limit</i>
e) Use scientific principles to <i>implement</i> strategies to answer open-ended questions.	<i>150 word limit</i>		<i>150 word limit</i>
f) Critically evaluate scientific arguments and identifies the limits of scientific knowledge.	<i>150 word limit</i>		<i>150 word limit</i>
g) Explore complex questions and identify how they impact or are impacted by external issues (political, economic, or ethical).	<i>150 word limit</i>		<i>150 word limit</i>
h) Solve or demonstrate resolutions to complex questions or problems requiring the application of scientific concepts.	<i>150 word limit</i>		<i>150 word limit</i>
i) Communicate scientific ideas effectively.	<i>150 word limit</i>		<i>150 word limit</i>

CRITICAL THINKING AND REASONING: COMPLETE AT LEAST THE FIRST FOUR OF THE FOLLOWING

Criteria: Students will...	Evidence of Student Engagement	Assessment Types	Description
a) Analyze evidence to support or create interpretations, arguments, or claims	<i>150 word limit</i>		<i>150 word limit</i>
b) Identify and analyze the connection between evidence and claims	<i>150 word limit</i>		<i>150 word limit</i>
c) Evaluate the strength and weaknesses of conclusions and opinions	<i>150 word limit</i>		<i>150 word limit</i>
d) Determine the scope of evidence needed for original arguments	<i>150 word limit</i>		<i>150 word limit</i>
e) Demonstrate a variety of scientific principles empirically and the ways scientists from a particular discipline conduct research.	<i>150 word limit</i>		<i>150 word limit</i>

f) Analyze the effective use of a scientific method through exploration of a given subject or topic.	<i>150 word limit</i>		<i>150 word limit</i>
g) Explore alternative solutions to complex questions through critical evaluation of an investigation.	<i>150 word limit</i>		<i>150 word limit</i>
h) Critically evaluate quantitative or qualitative products (tables, graphs, mathematical equations) and identifies/acknowledges the limitations and capabilities of knowledge.	<i>150 word limit</i>		<i>150 word limit</i>
i) Comprehensively analyze evidence before they create, critique, or accept an opinion, conclusion, or determine a need for further investigation	<i>150 word limit</i>		<i>150 word limit</i>

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

QUANTITATIVE REASONING: COURSE MUST MEET AT LEAST THE FIRST THREE OF THE FOLLOWING

Criteria: Students will...	Course Meets Criteria?	Comments
a) Interpret models and solve quantitative problems from different contexts with real world relevance.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unclear	
b) Create reasonable arguments supported by quantitative evidence (e.g., using words, tables, graphs, and/or mathematical equations).	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unclear	
c) Communicate reasonable arguments supported by quantitative evidence (e.g., using words, tables, graphs, and/or mathematical equations).	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unclear	
d) Demonstrate a variety of mathematical principles and methods of data analysis.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unclear	
e) Students will apply or demonstrate the use of quantitative analyses in a variety of different contexts to construct explanations and/or solve problems.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unclear	

**Total Number of QUANTITATIVE REASONING
Criteria Met by Course Proposal:**

/5

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 <i>describe/explain</i> natural phenomena through application of a scientific method.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unclear	
b) Identify and use empirical evidence to <i>predict</i> natural phenomena through application of a scientific method.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unclear	
c) Use scientific principles to <i>design</i> strategies to answer open-ended questions.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unclear	
d) Use scientific principles to <i>evaluate</i> strategies to answer open-ended questions.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unclear	
e) Use scientific principles to <i>implement</i> strategies to answer open-ended questions.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unclear	
f) Critically evaluate scientific arguments and identifies/acknowledges the limits of scientific knowledge.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unclear	
g) Explore complex questions and identify how they impact or are impacted by external issues (political, economic, or ethical).	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unclear	
h) Solve or demonstrate resolutions to complex questions or problems requiring the application of scientific concepts.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unclear	
i) Communicate scientific ideas effectively.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unclear	

**Total Number of SCIENTIFIC REASONING
Criteria Met by Course Proposal:**

/9

CRITICAL THINKING AND REASONING: COMPLETE AT LEAST THE FIRST FOUR OF THE FOLLOWING

Criteria: Students will...	Course Meets Criteria?	Comments
a) Analyze evidence to support or create interpretations, arguments, or claims.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unclear	
b) Identify and analyze the connection between evidence and claims.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unclear	
c) Evaluate the strength and weaknesses of conclusions and opinions.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unclear	
d) Determine the scope of evidence needed for original arguments.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unclear	
e) Demonstrate a variety of scientific principles empirically and the ways scientists from a particular discipline conduct research.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unclear	

<p>f) Analyze the effective use of a scientific method through exploration of a given subject or topic.</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unclear</p>	
<p>g) Explore alternative solutions to complex questions through critical evaluation of an investigation.</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unclear</p>	
<p>h) Critically evaluate quantitative or qualitative products (tables, graphs, mathematical equations) and identifies/acknowledges the limitations and capabilities of knowledge.</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unclear</p>	
<p>i) Comprehensively analyze evidence before they create, critique, or accept an opinion, conclusion, or determine a need for further investigation</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unclear</p>	

**Total Number of CRITICAL THINKING AND REASONING
Criteria Met by Course Proposal:**

/5

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

**Solutions Through Science:
applied science, with an emphasis on understanding and solving problems in the
natural, physical, and technological sciences**

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.

Critical Thinking and Reasoning: Students will be able to comprehensively analyze evidence before they create, critique, or accept an opinion, conclusion, or determine a need for further investigation.

COURSE DESCRIPTION & OBJECTIVES

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

5	4	3	2	1
Description and objectives show an exceptional emphasis on the required student learning outcomes.	Description and objectives show a clear emphasis on the required student learning outcomes.	Description and objectives adequately address the required student learning outcomes.	Description and objectives make limited reference to the required student learning outcomes.	Description and objectives make no reference to the required student learning outcomes.

COURSE FOCUS

Based on the course syllabus, assign an appropriate rating to the course focus by determining what percentage of the course content deals with the required Student Learning Outcomes.

5	4	3	2	1
90-100% of the course appears to be related to the student learning outcomes	80-89% of the course appears to be related to the student learning outcomes	70-79% of the course appears to be related to the student learning outcomes	50-69% of the course appears to be related to the student learning outcomes	0-49% of the course appears to be related to the student learning outcomes
100%	90%	80%	70%	50%
				0%

EVIDENCE OF STUDENT LEARNING

Based on the following Criteria Checklist, assign an appropriate rating to course assessments in relation to the required Student Learning Outcomes.

5	4	3	2	1
Assessments far exceed the minimum requirements for ensuring student learning outcomes.	Assessments exceed the minimum requirements for ensuring student learning outcomes.	Assessments meet the minimum requirements for ensuring student learning outcomes.	Assessments do not meet the minimum requirements for ensuring student learning outcomes.	Assessments need significant improvement to ensure student learning outcomes.