**Course Number & Title or Degree Program Name:**

**Indicate if this is: ☐ a course, or ☐ a degree program**

**Overview:**

Foothill College’s General Education curriculum provides students with a well-rounded education, fostering critical thinking, communication, and interdisciplinary understanding. Faculty play a central role in ensuring GE courses align with these goals and prepare students for academic, professional, and civic success.

This form guides instructors in demonstrating how their course meets the learning outcomes for its designated GE area. Instructors should explain how their course develops analytical and communication skills, integrates diverse perspectives, and fosters interdisciplinary connections. Your contributions help maintain a rigorous and relevant GE curriculum that supports student achievement.

**Breadth Criteria:**

Foothill College’s General Education curriculum equips students with broad and deep knowledge, preparing them to be independent thinkers and engaged members of a diverse society. GE courses encourage intellectual curiosity, interdisciplinary exploration, and critical engagement with the world.

Students gain exposure to a range of disciplines, including the arts, humanities, natural sciences, social sciences, and mathematics. This breadth fosters connections across fields and deepens understanding of cultural, social, and physical environments.

All GE courses emphasize critical analysis and ethical reasoning, challenging students to evaluate complex issues, articulate perspectives, and engage thoughtfully with diverse viewpoints. The curriculum also promotes equity, inclusion, and global awareness, ensuring students are prepared to contribute meaningfully to an interconnected world.

A completed GE pattern enables students to acquire, apply, and demonstrate competence in essential academic and professional competencies.

**Depth Criteria for Area 5 - Natural Sciences (with Lab):**

Natural Sciences courses focus on exploring the physical universe, its life forms, and the measurable natural phenomena that govern its operations. These courses emphasize the scientific method as a means of discovery and understanding, fostering critical thinking, data analysis, and an appreciation of the interconnectedness between science and human activity.

Laboratory components complement lectures by providing hands-on experiences where students directly interact with the material world, utilize scientific tools, and apply theoretical concepts to real-world scenarios. Together, lecture and lab experiences promote a comprehensive understanding of scientific principles, preparing students to analyze complex systems and contribute to solving pressing scientific and societal challenges.

### **Instructions for Mapping Course Components to Criteria**

Please follow the steps below to demonstrate how your course (or degree program) fulfills the Breadth and Depth criteria for General Education Area 5 - Natural Sciences (with Lab). Use specific components from the Course Outline of Record (COR), such as course outcomes, expanded content, methods of instruction/evaluation, and/or lab content.

If mapping a degree program, please indicate from which course in the sequence you are sourcing COR components.

### **Breadth Mapping**

For each of the following competencies, indicate if and how your course or degree program meets the requirement and provide corresponding course component(s) from the COR.

1. **Communication**
Analytical reading, writing, speaking, and listening skills, including evaluation, synthesis, and research.
	* Matching course component(s):
2. **Computation**
Application of mathematical concepts or principles of data collection and analysis to solve problems.
	* Matching course component(s):
3. **Critical Expression**
Clearly and precisely express ideas in a logical and organized manner using discipline-appropriate language.
	* Matching course component(s):
4. **Community and Global Awareness**
Consideration of one's role in society at local, national, and global levels in the context of cultural constructs and historical/contemporary issues.
	* Matching course component(s):
5. **Information and Digital Literacy**
The set of integrated abilities that includes: the reflective discovery of information, the understanding of how information is produced and valued, the use of information in creating new knowledge, the ethical participation in communities of learning, and the ability to use information and communication technologies to find, evaluate, create, and communicate information, requiring both cognitive and technical skills.
	* Matching course component(s):

### **Depth Mapping**

#### **Mandatory Depth Outcomes (Lecture)**

Your course must address all the following outcomes. For each outcome, map the corresponding course component(s) from the COR.

1. **Scientific Method**Develop an understanding of the scientific method, including its attributes and limitations.
	* Matching course component(s):
2. **Judging Evidence**Build the ability to evaluate the validity of scientific evidence.
	* Matching course component(s):
3. **Scientific Concepts**Foster an understanding of the relationship between hypothesis, experiment, fact, theory, and law.
	* Matching course component(s):
4. **Reasoning Skills**Cultivate the ability to use inductive, deductive, and model-based reasoning to solve problems.
	* Matching course component(s):
5. **Critical Thinking**Encourage the practice of critical thinking, including evaluating ideas, contrasting opinions, and drawing reasoned conclusions.
	* Matching course component(s):

#### **Optional Depth Outcomes (Lecture)**

In addition to the mandatory outcomes, your course or sequence must address **at least two** of the following outcomes. For each selected outcome, map the corresponding course component(s).

1. **Appreciation of Science in Modern Life**Develop an appreciation of the contributions of science to modern life.
	* Matching course component(s):
2. **Diversity in Science**Recognize contributions to science by diverse people and cultures.
	* Matching course component(s):
3. **Human-Environment Interdependence**Understand the interdependence of humans and their environment.
	* Matching course component(s):
4. **Impact of Human Behavior**Recognize how human behavior has altered the environment.
	* Matching course component(s):
5. **History of Science**Explore the history of science, including the ideas and experiments that have shaped the scientific method.
	* Matching course component(s):

#### **Mandatory Depth Outcomes (Lab)**

Laboratory components must align with the following definition of laboratory experience (adapted from the National Research Council (2005):

Laboratory experiences provide opportunities for students to interact directly with the material world (or with data drawn from the material world), using the tools, data collection techniques, models, and theories of science. This definition includes student interaction with astronomical databases, genome databases, databases of climatic events over long time periods, and other large data sets derived directly from the material world. It does not exclusively include student manipulation or analysis of data created by a teacher to simulate direct interaction with the material world.

Your course must address all the following outcomes. For each outcome, map the corresponding course component(s) from the COR.

1. **Direct Interaction**Engage in observation and data collection through direct interaction with the material world.
	* Matching course component(s):
2. **Scientific Tools and Techniques**Use tools, data collection techniques, models and model-based reasoning, and theories consistent with those employed in research laboratories.
	* Matching course component(s):
3. **Data Analysis with Authentic Data Sets**Work with data derived directly from the material world (e.g., large data sets such as astronomical, genome, and climate databases) and avoid exclusive reliance on teacher-created data.
	* Matching course component(s):
4. **Hypothesis Testing**Formulate and test hypotheses using recognized scientific methodologies.
	* Matching course component(s):
5. **Communication & Collaboration**Communicate findings effectively through oral and/or written work independently and as a member of a team.
	* Matching course component(s):

#### **Optional Depth Outcomes (Lab)**

In addition to the mandatory outcomes, your course or sequence must address **at least two** of the following outcomes. For each selected outcome, map the corresponding course component(s).

1. **Experimental Records**Maintain accurate and complete experimental records.
	* Matching course component(s):
2. **Quantitative and Qualitative Measurements**Perform accurate quantitative and qualitative measurements.
	* Matching course component(s):
3. **Interpreting Results**Interpret experimental results and draw reasonable conclusions.
	* Matching course component(s):
4. **Statistical Data Analysis**Analyze data statistically and assess the reliability of results.
	* Matching course component(s):
5. **Evaluating Experiment Design**Design and conduct, as well as critically evaluate the design of experiments for validity and reliability.
	* Matching course component(s):

**Submit your completed form to your Division Curriculum Reps**

Requesting Faculty: Date:

Division Curriculum Rep: Date:

**FOR USE BY CURRICULUM OFFICE:**

Approved: Denied: CCC Co-Chair Signature: Date:

### **Degree Program Addendum**

If you are submitting a complete degree program (sequence of courses) to fulfill the requirements for this General Education Area, please provide a justification for why a sequence is being proposed instead of a single course. This justification must clearly demonstrate how the sequence, taken as a whole, meets the **Breadth** and **Depth** criteria outlined for this area.

The justification should also touch on how the sequence of courses:

**Integrates learning outcomes** (The sequence is designed as a cohesive program where learning outcomes are distributed across courses to achieve the required breadth and depth.)

 and provides

**Progressive development** (The sequence builds skills or knowledge progressively, with later courses dependent on foundational learning established in earlier ones.)

#### **Instructions for Mapping Degree Programs**

1. Identify which courses in the sequence address specific **Mandatory Depth Outcomes** and **Optional Depth Outcomes**.
2. Provide a clear explanation of how each course contributes to fulfilling the **Breadth** criteria, noting any overlaps or unique contributions within the sequence.
3. Ensure the justification highlights the interdependence and integration of the courses within the sequence.

***Example:****Course A introduces foundational concepts in literature and philosophy, addressing Depth Outcomes 1 and 3. Course B expands on these foundations through artistic and historical analysis, addressing Depth Outcomes 2, 4, and 5. Together, the sequence fulfills all mandatory outcomes and optional outcomes 1 and 3.*

**Your Response:**