<table>
<thead>
<tr>
<th>Program goals</th>
<th>Student learning outcome. Upon completion of the program students will be able to:</th>
<th>Assessment</th>
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</table>
| Prepare program graduates to formulate and test multiple hypotheses based on the scientific method. | Demonstrate knowledge of how to ask questions that can be addressed by scientific investigation, help further understanding of observed phenomena, and help clarify scientific explanations and relationships. | • Lesson plan on conducting an experimental physics experiment (e.g., pendulum)  
• Final report on a Field Limnology project |
| Propose workable solutions to societal problems related to resource exploration and development, construction with the Earth, and environmental issues related to Earth processes. | Apply knowledge of engineering practices to define problems, determine specifications of designed systems, and identify constraints. | • Lesson plan on developing an engineering design and prototype (e.g., design of a knee support)  
• Final report on an Environmental Science and Engineering project (e.g., design of a water treatment process) |
| Prepare program graduates to design inquiry-based lesson plans to investigate the natural world using an integrated science approach based on the California Next Generation Science Standards. | Apply knowledge of patterns, cause-and-effect, scale, proportion, and systems characteristic of natural phenomena and engineered systems. | • Lesson plan on developing a field investigation (e.g., choosing the right combination of tools for a geophysical survey)  
• Final report on a Geochemistry or Planetary Science project (e.g., investigate an alkaline lake, or design a new sensor for a satellite to Venus) |
| Provide program majors with the tools to guide K-12 learners through the processes of experimental design, collection of data in the outdoors, and formulation of conceptual models. | Demonstrate ability to plan an NGSS-aligned lesson, coherently moving through the 5-E’s sequence (engage, explore, explain, elaborate, evaluate). | • Lesson plan on conducting astronomical observations (e.g., recording the phases of the Moon, or using an app to track the movement of Jupiter over several days)  
• Final group presentation on a biological investigation (e.g., the nature and mechanics of genetics) |
| Prepare program graduates to incorporate sound ethical and emotional values, cultural values, open and productive communication, and group collaboration into their educational persona. | Effectively incorporate ethical and cultural values of K-12 learners in their NGSS lessons | • Lesson plan on the universal character of science and engineering (e.g., the universal right to safe water)  
• Final group presentation on the contributions of indigenous knowledge regarding nature (e.g., indigenous fire management) |
| Prepare program graduates to incorporate sound ethical and emotional values, cultural values, open and productive communication, and group collaboration into their educational persona. | Effectively incorporate group collaboration and respectful communication/discussion in their NGSS lessons | • Lesson plan on teamwork and group discussion (e.g., neighborhood survey of environmental assets)  
• Final group presentation on the differences between different types of human knowledge and problem-solving (e.g., a respectful discussion on religious, artistic, and scientific approaches) |