Instructionally Related Activities:
Proposal for Continuing Recognition
Effective Fiscal Year 2020-2021

Please keep your answers concise. Attach supporting documentation if applicable—web pages, newspaper articles, etc. Boxes automatically expand as you type.

<table>
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<tr>
<th>1. Activity Name: Civil Engineering Design Fund: MO299 (three digits)</th>
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<th>2. Proposer/Advisor (Cal Poly Faculty or Staff Member)</th>
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<tr>
<td>Terry Johnson</td>
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<tr>
<td>Name</td>
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<td>Civil &amp; Environmental Engineering</td>
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<td>E-mail Address</td>
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<th>3. Category</th>
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<td>Check your IRA’s category at <a href="http://www.academicprograms.calpoly.edu/content/IRA/programs">http://www.academicprograms.calpoly.edu/content/IRA/programs</a></td>
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4. Recent IRA Outcomes Assessment
Provide results from the most recently completed outcomes assessment for this IRA.

a. For what academic year was the assessment data gathered?  ☒ 2018-19  ☐ 2019-20  Other _____

b. What were the stated learning outcomes in the IRA proposal for the year selected above?
1. students will design a bridge with materials and structural integrity that meet or exceed the requirements of the ABCCVE competition
2. students will continuously test and improve the designs while preparing for the competition
3. students will explain and justify their design to the judges
4. students will apply the required stresses to their model and demonstrate structural integrity
5. _____

c. Which of the above learning outcomes were assessed? (e.g. 1, 3, 4)  1, 2, 4

d. What methods were used to assess student learning?
☐ Student Focus Groups / Interviews  ☒ Rubric-based evaluation of artifacts/performances
☐ Student Surveys  ☒ Other – describe Team ranking in the competition

e. When did you gather this data? e.g. May 2019, after completion of the regional competition in Fresno, CA.  Fall Qtr during preparation for the competition, Winter Qtr at the competition

f. Provide a summary of the assessment results and any conclusions drawn: Students developed an initial design and predicted the strength and stresses with computer models. They then built a prototype and tested it according to the stress parameters outlined by the ABCCVE contest judges. Based on the results, students improved the design through three more iterations and took the forth version to the regional competition. I ranked the development process and final design all 4s and 5s on a 0 to 5 rubric (see attached). At the competition, the team design and student presentation was ranked #1 out of 23 competing teams.

g. How will the assessment conclusions be used to improve this IRA in the coming year(s)? I will emphasize increased computer modeling and small-scale component testing during the design and development phase with the goal of reducing the number of revisions needed to achieve a superior design.
5. Purpose and Goals
   a. What is the purpose of the activity?  The purpose is general and should be consistent from year to year. For example: Students will learn how to develop and present business plans.

   Students will work as a team, applying their knowledge of Civil and Materials Engineering to design a bridge, elevated walkway, or similar structure as part of an inter-collegiate competition.

   Has this purpose changed from prior years?  □ Yes  □ No

   If Yes, how has the purpose changed? ______

   b. How does the purpose of the activity align with the mission of your department, college, division, or university?

   The mission of the College of Engineering is “To provide an excellent Learn by Doing education and graduate in-demand, day-one ready professionals.” These competitions require students to apply what they have learned in their engineering courses to real-world design scenarios - Learn by Doing activities which will help prepare them to be ready day-one for careers in civil engineering.

   c. Briefly state one to three goals for this IRA for the coming year. Make it clear how, through these goals, the activity will accomplish its purpose. For example, in the purpose stated above, one goal may be to send a team of students to a particular conference to compete against teams from other universities in business plan development and presentation.

   1. For 2020-21, students will design and build a 1/20th scale bridge according to the requirements of the IABCCVE competition in Seattle, using Civil Engineering best concepts and their knowledge of materials.

   2. Compete against West Coast university teams at the regional conference in Winter 2021.

   3. Win 1st or 2nd place at the regionals and go on to compete in the nationals in Spring 2021.

6. Learning Outcomes
   For each goal listed in section 5c, provide up to three outcomes for what students will know, be able to do, or come to value as a result of their participation in the IRA.

   Please refer to the guidelines How To Write Learning Outcomes on the Academic Programs IRA page (https://academicprograms.calpoly.edu/content/IRA/index) for help in formulating these.

   As a result of participation, students will:

   Goal 1, outcome 1.1: students will design a bridge with materials and structural integrity that meet or exceed the requirements of the IABCCVE competition

   outcome 1.2: students will continuously test and improve the designs while preparing for the competition

   outcome 1.3: ______

   Goal 2, outcome 2.1: students will explain and justify their design to the judges

   outcome 2.2: students will apply the required stresses to their model and demonstrate structural integrity

   outcome 2.3: ______

   Goal 3, outcome 3.1: N/A

   outcome 3.2: ______

   outcome 3.3: ______
7. Assessment Plan
Describe how you will assess the learning outcomes listed in section 6. Results will be reviewed in future continued funding proposals.

a. Which learning outcomes from section 6 above will you be assessing? e.g. 1.1, 2.3, and 3.2 1.1, 1.2, 2.2

b. Check the assessment methods that will be used to determine to what degree participating students met the intended learning outcomes provided in section 6.

☐ Student Focus Groups / Interviews  ✖ Rubric-based evaluation of artifacts/performances
☐ Student Surveys  ✖ Other – describe Team ranking in the competition

c. When do you plan to gather this data? Faculty advisor will design and use a rubric for assessing the final student design prior to the competition at the end of Fall Quarter. We will also record team ranking at the end of the competition in Winter Quarter.

d. How will you analyze/interpret the results produced from the above assessment method(s)? Using the rubric designed by the faculty advisor, we will analyze how well the design met or exceeded the requirements of the competition to determine how well the students understood the requirements and applied their understanding of Civil Engineering and Materials. Ranking in their competition will give additional information regarding the student’s understanding of these and Civil Engineering best practices.

e. How will you use the results to improve this IRA in future years? We will determine areas where students need additional guidance and emphasize these in the instruction of future teams.

8. Instructional/Program Affiliation. IRAs must be related to a formal program or instructional offering at Cal Poly. See Executive Order #429 on the Academic Programs IRA page. List one or more courses, majors, or other type of program where the subject matter supports the activities or goals of the IRA. For example, the subject matter taught in Materials Engineering and Civil Engineering support the design work for the Steel Bridge competition IRA. Note that IRA funds cannot be used to cover course or program expenses.

Courses, majors, or programs: Civil Engineering degree program, Materials Engineering degree program

9. Student Involvement
a. Number of students from each college who participated in the IRA for AY (choose one) ☒ 2018-19  ☐ 2019-20  Other ______
   CAFES 0, CAED 2, OCOB 0, CENG 14, CLA 0, CSM 1

b. Number of students from each college projected to be active participants in this IRA next year:
   CAFES 1, CAED 1, OCOB 0, CENG 15, CLA 0, CSM 1
10. Approvals. All signatures are required. Forms with missing signatures will not be considered by the committee.

By signing below, I confirm that this activity is aligned with the academic mission(s) of the department, college, division, or university, and that I will advise/supervise/support these activities consistent with university policies and procedures.

____________________________________
Proposer/Advisor signature (from section 2)    Date

By signing below, we confirm that this activity is aligned with the academic mission(s) of the department, college, division, or university, and that we will assign university faculty and/or staff to supervise these activities in a manner consistent with university policies and procedures.

Francis Sojourn
Department Chair/Head or Program Director (Name)
Signature    Date

Jordan Chen-Coget
College Dean/Associate Dean/Vice President (Name)
Signature    Date

For more information, see the IRA page at Academic Programs and Planning
https://academicprograms.calpoly.edu/content/IRA/index

Important dates:
Continuing Proposal and Budget Forms, with all signatures, are due to your College Dean’s Office or, for Student Affairs IRAs, the Vice President Student Affairs, no later than end of day on Friday 3/6/2020.

All University Interest category IRA forms, reviewed and approved by Deans and VP Student Affairs, are due to Jessica Carson in Academic Programs and Planning no later than end of day on Friday 4/3/2020. Forms may be scanned and emailed to carson@calpoly.edu or sent through campus mail to Jessica Carson, Academic Programs and Planning, room 35-319.

All allocation recommendations and signed proposal forms from the Colleges and Student Affairs are due to Jessica Carson in Academic Programs and Planning no later than end of day on Friday, 5/22/2020. Forms/spreadsheets may be scanned and emailed to carson@calpoly.edu or sent through campus mail to Jessica Carson, Academic Programs and Planning.

Recommended allocations for 2020-21 should be approved by mid-June, after which all proposers, colleges, and VP Student Affairs will be notified.