**Academic Policies Committee**
**Short Form Proposal Template**

Schools/departments should use this short form to submit proposals:

- Needing only APC approval (revision of course descriptions including title, number or prerequisites, alternate year listing in the Catalog and the cross listing of courses); or
- Eliminating (or adding?) 1-3 courses which don't impact other programs*; or
- Eliminating a minor, concentration, credential program or certificate which doesn't impact other programs.*
  *confirmed by direct administrative report (college dean or provost).

All submitted proposals need to adhere to the following template in order to facilitate the work of the Academic Policies Committee. **For ease of APC Committee reading, please submit your responses in BLUE text.**

**I. WHO - Academic Unit Name:** Physics and Engineering

**II. WHAT – Proposal Summary:** Change a grading option on a course.

**III. WHY – Proposal Rationale** (might include):

- Market analysis (size, market share, revenue generation with analysis and rationale)
- Impact on support services (library, technology, Student Financial Services, Records)
- A discussion of department/school and institution mission fit
- Impact on enrollments (course, department/school, university)
- Impact on department/school staffing (increase/decrease, ability to staff the course, etc.)
- Financial Analysis

During our department's annual review of catalog content, it became clear that department consensus is that student engagement in PHY495 Senior Seminar would improve if students were to receive a letter grade for the course.

There is no additional impact on library services or technology.

**IV. HOW – Curricular Changes:**

A. Curriculum - Short Form proposals should include current and proposed course descriptions including title, number, units, and if needed prerequisites, alternate year listing in the catalog and cross-listed courses. Language must be exactly as the Department/ School wants it to appear in the Catalog. Proposing school/department should work with APC chair to generate proposed Catalog text and attach to this form at the time of submission.

Change grading option from CR/NC to letter:

PHY 495 - Seminar in Physics (1)
Presentation of papers by students, faculty, and visiting scholars, as well as attendance at seminars at other institutions. May be repeated up to a maximum of four units. ~~Graded Credit/No Credit.~~

B. Summary Information:

| | |
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| Total course/unit additions:<br>0 | Net financial impact:<br>0 |
| Total course/unit deletions: | Library resourcing impact: |

| | |
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| 0 | 0 |
| Staffing unit increase/decrease:<br>0 | |

I have reviewed this proposal and the items above and believe the proposal meets all university requirements, don not impact other departments or programs, and is ready for APC review.

Department or School Direct Report: Maria Zack

Holly Irwin _____ Date 11.13.16

College Dean or Provost as applicable

Note: Submit completed short form proposal to the APC chair not later than one month prior to the APC meeting at which you hope it can be placed on the agenda.

**ACADEMIC POLICIES COMMITTEE**
**LONG FORM PROPOSAL TEMPLATE**

- Proposals should use this long form if they:
  - Need faculty and/or WASC approval;
  - Request elimination, addition or revision of multiple courses and/or courses impacting other departments or schools; or
  - Request elimination, addition or revision of a major, minor, concentration or credential program.
- All submitted proposals need to adhere to the following template in order to facilitate the work of the Academic Policies Committee.
- **Please read the attached "APC Proposal Reference Information" before completing this form.**
- **For ease of APC Committee reading, please submit your responses in BLUE text.**

**SUBMISSION DATE: November 11, 2016**

## SECTION ONE: WHO

1. **Academic Unit Name: Physics and Engineering**
2. **Recorded Department/School Vote** (Please provide the number and percentage of department/school faculty who voted in approval for this proposal): **100%**
3. **Impact on Other Department(s)/School(s)** (Are there other departments/schools impacted by this proposal? If so, how did the other department[s]/school[s] vote on this proposal?): **None**
4. **Impact on Services:**
   a. Ryan Library:
      i. What new library acquisitions, if any, will be needed to support the proposed changes (if none, please state that): **None**
      ii. Person and Date of Contact: _____
   b. Instructional Technology:
      i. How many new online/hybrid courses does this proposal include: **None**
      ii. How many instructors will need online training or course development assistance over the first two sessions if this proposal is approved: **None**
      iii. Person and Date of Contact:_____

## SECTION TWO: WHAT

1. **Overall Proposal Description (**In one sentence, describe the nature of the proposed changes or the proposed new academic offering): **Make some minor modifications to the two concentrations in Engineering Physics.**
2. **Items** (Please describe each item of the proposal with a phrase or one-sentence abstract. Examples might be, "Item 1: To drop XXX course from XX program. Item 2: To add XX course as a requirement", etc. Some proposals will only have 1 item. Add item lines as needed.):
   a. Item 1: **Add PHY 362 - Electricity, Magnetism, and Waves II (3) to the list of requirements for all Engineering Physics majors**
   b. Item 2: **Remove EGR 225 - Electronics Circuits Analysis (3) from to the list of requirements for Engineering Physics Emphasis in Mechanics**

c. Item 3: **Add EGR 352 - Analog Electronics (2) and EGR 422 - Digital Electronics (2) to the list of requirements for Engineering Physics Emphasis in Mechanics**

## SECTION THREE: WHY

1. **General** Rationale (Please provide a one-sentence rationale for this proposal.): **The electronics portion of the Mechanics Emphasis in Engineering Physics needed to be adjusted. The students were being taught theory (great for Electrodynamics students) rather than practical, hands on ideas from electronics.**
2. **Mission (**How do the proposed changes support the mission of the university?): **This strengthens the Engineering Physics Emphasis in Mechanics and gives the students some practical understanding and experience with the engineering ideas at work in many San Diego companies where our graduates are employed (SPAWAR, Qualcomm, ViaSat, etc).**
3. **Internal Factors (**Please provide additional rationale by answering the following questions as applicable: How does the proposal(s) …address the PLNU strategic plan? …address factors arising from assessment data or program review findings? …accommodate the department or school's learning outcomes for the major, minor, concentration, etc.? …increase departmental effectiveness/efficiency? …enhance enrollment or generate new revenue? What impact will it have on the size of the major, minor, etc.? Other internal rationale?): **The department is a few years from its global review of the engineering program (slated for 2018-19) but in the interim we would like to adjust the curriculum to better equip the Engineering Physics Emphasis in Mechanics students. The students in the program we being asked to take a theoretical course on electronics (EGR 265 Electronics of Circuits) and will be better served by having a sequence of more practical "hands on" classes (EGR352 Analog Electronics and EGR422 Digital Electronics). The theoretical class is well suited for the students in the Engineering Physics Emphasis in Electrodynamics, but not for the Mechanics students. We can make these interim improvement by simply changing some requirement, this does not add any additional sections or classes to the existing department teaching load.**
4. **External Factors (** Please provide additional rationale by answering the following questions as applicable: To what extent have external factors motivated this proposal, for example what comparable colleges and universities are doing? …improvements suggested by alumni or outside reviewers? …stipulations imposed by outside accrediting agencies? …other external rationale?.)**: Anecdotally alumni have suggested that this change would be helpful. As stated above, the change better matches the students' major with knowledge that would be useful to them in the San Diego job market.**

## SECTION FOUR: HOW

A. **Assessment Plan** – For new programs, please provide an assessment plan. (If not needed, please state as such.) **Existing Assessment Plan works with these changes.**

B. **Teach-Out** – Provide a plan detailing how students who begin this program will be able to finish if the institution determines that the program is to be closed. (If not needed, please state as such). **N/A**

C. **Catalog Copy**--In this section, please demonstrate in a two-step process how the department/school would like the change to be made. Keep in mind academic policies with regard to number of units for major, minors, certificates, etc. See Academic Proposal Resource Information at the end of this template.

- **Step 1:** In the applicable set of boxes below:
  - For revision, addition or elimination of majors, minors, concentrations or certificates, complete Sections C1-2, entering current and/or proposed catalog text as indicated in the section instructions.
  - For revision, addition or elimination of courses only, please scroll down to and complete Section C-2 only, entering current and/or proposed catalog text as indicated in the section instructions

| **Section C-1—Program Changes:** Proposals for elimination of a major, minor, concentration or certificate should complete the shaded (left) side of this section only, proposals for addition of any of these should complete the unshaded (right) side only, and proposals for revision of any of these should complete both sides of Section A. | |
|---|---|
| Current Program (or major, minor, concentration, certificate) Name and Introductory Text: **Engineering Physics** | Proposed Revised or New Program (or major, minor, concentration, certificate) Name and Introductory Text: |
| Current Program Learning Outcome:<br>1. **Develop an understanding of the fundamental principles of physics and of engineering.**<br>2. **Apply physical principles, mathematical reasoning, and computational techniques to solve real-world problems.**<br>3. **Design and conduct experiments or complete an engineering design project as well as analyze and interpret data.**<br>4. **Demonstrate good ethics in science and engineering.**<br>5. **Communicate complicated technical information.**<br>6. **Collaborate in teams.** | Proposed Revised or New Program Learning Outcomes (needed for new majors only):<br>1. **Develop an understanding of the fundamental principles of physics and of engineering.**<br>2. **Apply physical principles, mathematical reasoning, and computational techniques to solve real-world problems.**<br>3. **Design and conduct experiments or complete an engineering design project as well as analyze and interpret data.**<br>4. **Demonstrate good ethics in science and engineering.**<br>5. **Communicate complicated technical information.**<br>6. **Collaborate in teams.** |
| Current Lower Division Requirements and Unit Numbers for Majors. All requirements for minors, concentrations or certificates:<br><br>EGR 110 - Computational Methods for Engineers and Scientists I (1)<br>EGR 120 - Computational Methods for Engineers & Scientists II (1)<br>PHY 241 - University Physics I (GE) (4) | Proposed Revised or New Lower Division Requirements and Unit Numbers for Majors. All requirements for minors, concentrations or certificates:<br>EGR 110 - Computational Methods for Engineers and Scientists I (1)<br>EGR 120 - Computational Methods for Engineers & Scientists II (1)<br>PHY 241 - University Physics I (GE) (4) |

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|---|---|
| PHY 242 - University Physics II (4)<br>CHE 152 - General Chemistry I (GE) (4)<br>MTH 164 - Calculus I (GE) (4)<br>MTH 174 - Calculus II (4)<br>MTH 274 - Calculus III (4) | PHY 242 - University Physics II (4)<br>CHE 152 - General Chemistry I (GE) (4)<br>MTH 164 - Calculus I (GE) (4)<br>MTH 174 - Calculus II (4)<br>MTH 274 - Calculus III (4) |
| **Current Total Lower Division Units: 26 (8 units GE)** | **Proposed Total Lower Division Units: 26 (8 units GE)** |
| Current Upper Division Requirements and Unit Numbers for Majors. (Highlight new or revised classes in red.)<br><br>PHY 304 - Modern Physics (4)<br>PHY 341 - Analytical Mechanics (4)<br>PHY 361 - Electricity, Magnetism, and Waves I (3)<br>PHY 401 - Thermodynamics (3)<br>PHY 431 - Quantum Mechanics (3)<br>PHY 475 - Senior Laboratory and Student Project (2)<br>PHY 495 - Seminar in Physics (1)<br>MTH 333 - Differential Equations (3) | Proposed Upper Division Requirements and Unit Numbers for Majors. (Highlight new or revised classes in red.)<br><br>PHY 304 - Modern Physics (4)<br>PHY 341 - Analytical Mechanics (4)<br>PHY 361 - Electricity, Magnetism, and Waves I (3)<br>PHY 362 - Electricity, Magnetism, and Waves II (3)<br>PHY 401 - Thermodynamics (3)<br>PHY 431 - Quantum Mechanics (3)<br>PHY 475 - Senior Laboratory and Student Project (2)<br>PHY 495 - Seminar in Physics (1)<br>MTH 333 - Differential Equations (3) |
| **Current Total Upper Division Units: 23 units** | **Proposed Total Upper Division Units: 26 units** |
| Current Elective Options (Highlight new or revised classes in red.):<br><br>Complete one of the following courses<br>PHY 311 - Nuclear Physics (3)<br>PHY 443 - Solid State Physics (3) | Proposed Elective Options (Highlight new or revised classes in red.):<br><br>Complete one of the following courses<br>PHY 311 - Nuclear Physics (3)<br>PHY 443 - Solid State Physics (3) |
| **Current Total Required Elective Units: 3 units** | **Proposed Total Required Elective Units: 3 units** |
| Current Names and Course Titles of Concentration #1 (if any—use additional boxes for each concentration.):<br><br>Emphasis in Mechanics<br>EGR 215 - Engineering Mechanics (3)<br>EGR 225 - Electronics Circuits Analysis (3)<br>EGR 265 - Mechanics of Materials (3)<br><br>Emphasis in Electrodynamics<br>EGR 225 - Electronics Circuits Analysis (3)<br>EGR 352 - Analog Electronics (2)<br>EGR 422 - Digital Electronics (2)<br>EGR 432 - Computer Interfacing (2) | Proposed Names and Course Titles of Concentration #1 (if any—use additional boxes for each concentration.):<br><br>Emphasis in Mechanics<br>EGR 215 - Engineering Mechanics (3)<br>EGR 352 - Analog Electronics (2)<br>EGR 422 - Digital Electronics (2)<br>~~EGR 225 - Electronics Circuits Analysis (3)~~<br>EGR 265 - Mechanics of Materials (3)<br><br>Emphasis in Electrodynamics<br>EGR 225 - Electronics Circuits Analysis (3)<br>EGR 352 - Analog Electronics (2)<br>EGR 422 - Digital Electronics (2)<br>EGR 432 - Computer Interfacing (2) |

| | |
|---|---|
| EGR 442 - Mobile Robotics (2)<br>PHY 362 - Electricity, Magnetism, and Waves II (3) | EGR 442 - Mobile Robotics (2)<br>~~PHY 362 - Electricity, Magnetism, and Waves II (3)~~<br>(Moved to program requirements for both programs) |
| **Current Total Program Units:**<br><br>Emphasis in Mechanics 61 (8 units GE)<br>Emphasis in Electrodynamics 65 (8 units of GE) | **Proposed Total Program Units:**<br><br>Emphasis in Mechanics 66 units (8 units GE)<br>Emphasis in Electrodynamics 65 units (8 units GE) |
| Current Notes (if any) at the bottom of program catalog copy:<br><br>Recommended Courses:<br>CSC 143 - Introduction to Computer Programming (3)<br>CSC 154 - Objects and Elementary Data Structures (4) | Proposed Notes (if any) at the bottom of program catalog copy:<br><br>Recommended Courses:<br>CSC 143 - Introduction to Computer Programming (3)<br>MTH 233 – Linear Algebra (3)<br>CSC 154 - Objects and Elementary Data Structures (4) |
| **Section C-2—Course Changes:** Proposals for course elimination should complete the shaded (left) side only, proposals for course addition should complete the unshaded (right) side only, and proposals for program or course revision should complete both sides of Section B. Proposals involving only course additions, eliminations or revisions should complete only this section. | |
| Current course code and description (including units, prerequisites and grade type): **Text** | Proposed new course code and description (including units, course learning outcomes, prerequisites and grade type): **Text** |
| Course 1: **Text** | Course 1: **Text** |
| Course 2: **Text** | Course 2: **Text** |
| Course 3: **Text** | Course 3: **Text** |
| | |

- **Step 2:**
  - Arrange a meeting: Arrange a meeting with the APC chair to review the completed portion of the proposal and to receive assistance from the Records liaison in submission of current and/or draft proposed catalog copy called for.
  - Attach Catalog copy:
    - For proposed revisions to existing programs, majors, minors, courses, etc, after this page attach the following supplied by Records: 1) The current year catalog copy for that program, major, etc, and 2) the proposed revised catalog pages for your proposal, based on the information from Step One.
    - For entirely new programs, majors, minors, courses, etc, after this page attach the draft new catalog pages for your proposal supplied by Records based on the information in Step One.

STEP TWO: ATTACH CURRENT AND/OR PROPOSED CATALOG COPY AFTER THIS PAGE AS SEPARATE PAGES.

Engineering Physics

Program Learning Outcomes
Students who complete the Engineering Physics program will be able to:

1. Develop an understanding of the fundamental principles of physics and of engineering.
2. Apply physical principles, mathematical reasoning, and computational techniques to solve real-world problems.
3. Design and conduct experiments or complete an engineering design project as well as analyze and interpret data.
4. Demonstrate good ethics in science and engineering.
5. Communicate complicated technical information.
6. Collaborate in teams.

Core Curriculum
The following courses are required of all Physics and Engineering Physics majors:

EGR 110 - Computational Methods for Engineers and Scientists I (1)
EGR 120 - Computational Methods for Engineers & Scientists II (1)
PHY 241 - University Physics I (GE) (4)
PHY 242 - University Physics II (4)
PHY 304 - Modern Physics (4)
PHY 341 - Analytical Mechanics (4)
PHY 361 - Electricity, Magnetism, and Waves I (3)
PHY 362 - Electricity, Magnetism, and Waves II (3)
PHY 401 - Thermodynamics (3)
PHY 431 - Quantum Mechanics (3)
PHY 475 - Senior Laboratory and Student Project (2)
PHY 495 - Seminar in Physics (1)
CHE 152 - General Chemistry I (GE) (4)
MTH 164 - Calculus I (GE) (4)
MTH 174 - Calculus II (4)
MTH 274 - Calculus III (4)
MTH 333 - Differential Equations (3)
Total: 52 Units

Recommended

CSC 143 - Introduction to Computer Programming (3)
MTH 233 – Linear Algebra (3)
CSC 154 - Objects and Elementary Data Structures (4)

Requirements
There are two possible options in the Engineering Physics Major:

- Emphasis in Mechanics
- Emphasis in Electrodynamics

Emphasis in Mechanics

EGR 215 - Engineering Mechanics (3)
EGR 265 - Mechanics of Materials (3)
EGR 352 - Analog Electronics (2)
EGR 422 - Digital Electronics (2)

Complete one of the following courses
PHY 311 - Nuclear Physics (3)
PHY 443 - Solid State Physics (3)
Total: 13 Units

Emphasis in Electrodynamics

EGR 225 - Electronics Circuits Analysis (3)
EGR 352 - Analog Electronics (2)
EGR 422 - Digital Electronics (2)
EGR 432 - Computer Interfacing (2)
EGR 442 - Mobile Robotics (2)

Complete one of the following courses:
PHY 311 - Nuclear Physics (3)
PHY 443 - Solid State Physics (3)
Total: 14 Units

STEP TWO: ATTACH CURRENT AND/OR PROPOSED CATALOG COPY BEFORE THIS PAGE AS SEPARATE PAGES.

## SECTION FIVE: SUMMARY CHECKLIST

**Review course and staffing impact with your academic unit's direct report (College Dean or Provost).**

- **Total course additions: 0**
- **Total course deletions: 0**
- **Total unit additions: 0**
- **Total unit deletions: 0**
- **Staff impact (increase or decrease): 0**
- **Rotation of courses or deletions of sections to accommodate additions: 0**

**I have reviewed this proposal and the items above and believe the proposal meets all university requirements and is ready for APC review.**

**Department or School Direct Report: Maria Zack**

Holly Irwin _____ **Date** 11.14.16

**College Dean or Provost as applicable**

**ACADEMIC POLICIES COMMITTEE**
**LONG FORM PROPOSAL TEMPLATE**

- Proposals should use this long form if they:
  - Need faculty and/or WASC approval;
  - Request elimination, addition or revision of multiple courses and/or courses impacting other departments or schools; or
  - Request elimination, addition or revision of a major, minor, concentration or credential program.
- All submitted proposals need to adhere to the following template in order to facilitate the work of the Academic Policies Committee.
- **Please read the attached "APC Proposal Reference Information" before completing this form.**
- **For ease of APC Committee reading, please submit your responses in BLUE text.**

**SUBMISSION DATE: November 11, 2016**

## SECTION ONE: WHO

1. **Academic Unit Name: Physics and Engineering and Chemistry**
2. **Recorded Department/School Vote** (Please provide the number and percentage of department/school faculty who voted in approval for this proposal): **100%**
3. **Impact on Other Department(s)/School(s)** (Are there other departments/schools impacted by this proposal? If so, how did the other department[s]/school[s] vote on this proposal?): **School of Education and Chemistry. School of Education – approval per Conni Campbell. Chemistry 100% approval voted 11/9.**
4. **Impact on Services:**
   a. Ryan Library:
      i. What new library acquisitions, if any, will be needed to support the proposed changes (if none, please state that): **None**
      ii. Person and Date of Contact: _____
   b. Instructional Technology:
      i. How many new online/hybrid courses does this proposal include: **None**
      ii. How many instructors will need online training or course development assistance over the first two sessions if this proposal is approved: **None**
      iii. Person and Date of Contact:_____

## SECTION TWO: WHAT

1. **Overall Proposal Description (**In one sentence, describe the nature of the proposed changes or the proposed new academic offering): **Create an improved Physical Science sequence for prospective teachers and add one new GE course in each of Physics and Chemistry that will be a physical science with a lab.**
2. **Items** (Please describe each item of the proposal with a phrase or one-sentence abstract. Examples might be, "Item 1: To drop XXX course from XX program. Item 2: To add XX course as a requirement", etc. Some proposals will only have 1 item. Add item lines as needed.):
   a. Item 1: **Remove PSC110 – Physical Science GE (3)**
   b. Item 2**: Remove PSC110L – Physical Science Lab GE (1)**

c. Item 3: **Remove PSC103 – Earth Science GE (4)**
**d.** Item 4: **Add PSC111 – Physical Science for Teachers GE (4)**
**e.** Item 5: **Add PSC112 – Earth and Space Science for Teachers (3)**
**f.** Item 6: **Add PHY113 - The Physics of Sound and Music GE (3)**
**g.** Item 7: **Add PHY113L - The Physics of Sound and Music Lab GE (1)**
**h.** Item 8: **Add 102 – The Chemistry of Cooking GE (3)**
**i.** Item 9: **Add 102L – The Chemistry of Cooking Lab GE (1)**

## SECTION THREE: WHY

1. **General** Rationale (Please provide a one-sentence rationale for this proposal.): **The California Commission for Teacher Credentialing have science education requirement for prospective teachers. Our courses PSC110 and PSC103 meet those requirements. However many of the students enrolled in PSC110 and PSC103 are not prospective teachers and these courses are not meeting their general education needs well.**
2. **Mission (**How do the proposed changes support the mission of the university?): **The proposed changes will allow PLNU to meet the needs of prospective teachers with a reduced number of units. The changes will also free up enough units to allow Physics and Engineering and Chemistry to each create one interesting GE course that will more effectively engage students with science and the scientific method.**
3. **Internal Factors (**Please provide additional rationale by answering the following questions as applicable: How does the proposal(s) …address the PLNU strategic plan? …address factors arising from assessment data or program review findings? …accommodate the department or school's learning outcomes for the major, minor, concentration, etc.? …increase departmental effectiveness/efficiency? …enhance enrollment or generate new revenue? What impact will it have on the size of the major, minor, etc.? Other internal rationale?): **The Physics and Engineering department has been reviewing its GE offerings this year. The GE courses are:**
    - **PSC 103 - Earth Science (GE)**
    - **PSC 105 - The Cosmos (GE)**
    - **PSC 110 - Physical Science (GE)**
    - **PSC 110L - Physical Science Laboratory (GE)**
    - **PHY 141 - General Physics I (GE)**
    - **PHY 142 - General Physics II (GE)**
    - **PHY 241 - University Physics I (GE)**

    **The classes highlighted in yellow are GE requirements for other area of STEM. PSC110/PSC110L and PSC103 (highlighted in blue) were created to meet CCTC requirements but are now taken by many more students than prospective teachers. All faculty teaching these two courses believe that the combination of meeting CCTC requirement and trying to offer a GE course for the general student body is not working effectively. The School of Education is also undergoing the process of renewing the CCTC test waiver authorization for the**

**Cross-Disciplinary Studies major, which meant that this is an ideal opportunity to take a look at the courses and evaluate what should be done with GE. Her are the conclusions:**

1. **There are enough students each year (30-32) to justify the creation of a specific physical science track for prospective teachers.**
2. **The prospective teachers take a Biology class with a lab so it is not a requirement of PLNU GE or the CCTC that the physical science courses have a lab.**
3. **The majority of the non-teachers who take the physical science classes take PSC110 because they need a class with a lab to meet their GE requirement.**

**Based on these conclusions here is the proposed change:**

1. **Create a two-course 7 unit sequence that satisfies the very specific requirements of the CCTC for Physical Science. The first course in the sequence will be a GE course, but instead of having a lab, will have hands-on in-class activities that are suitable for the elementary classroom. This course will be one half physics and one half chemistry and will be one quad of each topic. The second course will cover the required topics in earth and space science, but those topics can be covered in three units. Thus the second class will not be a GE option. Arranging these classes in this way, also allows for a single text to be used for both courses (a significant savings for students).**
2. **Our analysis shows that approximately 50 students each year enroll in PSC110 because they need a science class with a lab to meet their GE requirement. These 50 students are not prospective teachers. To better those students' needs we are proposing to add one section per year of:**
    a. **PHY103 - The Physics of Music (3) and PHY103L - The Physics of Music Lab (1)**
    b. **CHE102 - Chemistry in Our Everyday Lives (3) and CHE102L - Chemistry in Our Everyday Lives Lab (1)**

4. **External Factors (**Please provide additional rationale by answering the following questions as applicable: To what extent have external factors motivated this proposal, for example what comparable colleges and universities are doing? …improvements suggested by alumni or outside reviewers? …stipulations imposed by outside accrediting agencies? …other external rationale?.)**:**

## SECTION FOUR: HOW

A. **Assessment Plan** – For new programs, please provide an assessment plan. (If not needed, please state as such.) **No changes in assessment plans are needed for these GE changes – they will be assessing the same GELO's as PSC110 and PSC103 have assessed.**

B. **Teach-Out** – Provide a plan detailing how students who begin this program will be able to finish if the institution determines that the program is to be closed. (If not needed, please state as such). **N/A**

C. **Catalog Copy**--In this section, please demonstrate in a two-step process how the department/school would like the change to be made. Keep in mind academic policies with regard to number of units for major, minors, certificates, etc. See Academic Proposal Resource Information at the end of this template.

- **Step 1:** In the applicable set of boxes below:
    - For revision, addition or elimination of majors, minors, concentrations or certificates, complete Sections C1-2, entering current and/or proposed catalog text as indicated in the section instructions.
    - For revision, addition or elimination of courses only, please scroll down to and complete Section C-2 only, entering current and/or proposed catalog text as indicated in the section instructions

| **Section C-1—Program Changes:** Proposals for elimination of a major, minor, concentration or certificate should complete the shaded (left) side of this section only, proposals for addition of any of these should complete the unshaded (right) side only, and proposals for revision of any of these should complete both sides of Section A. | |
|---|---|
| Current Program (or major, minor, concentration, certificate) Name and Introductory Text: | Proposed Revised or New Program (or major, minor, concentration, certificate) Name and Introductory Text: |
| Current Program Learning Outcome: | Proposed Revised or New Program Learning Outcomes (needed for new majors only): |
| Current Lower Division Requirements and Unit Numbers for Majors. All requirements for minors, concentrations or certificates: | Proposed Revised or New Lower Division Requirements and Unit Numbers for Majors. All requirements for minors, concentrations or certificates: |
| **Current Total Lower Division Units:** | **Proposed Total Lower Division Units:** |
| Current Upper Division Requirements and Unit Numbers for Majors. (Highlight new or revised classes in red.) | Proposed Upper Division Requirements and Unit Numbers for Majors. (Highlight new or revised classes in red.) |
| **Current Total Upper Division Units:** | **Proposed Total Upper Division Units:** |
| Current Elective Options (Highlight new or revised classes in red.): | Proposed Elective Options (Highlight new or revised classes in red.): |
| **Current Total Required Elective Units:** | **Proposed Total Required Elective Units:** |
| Current Names and Course Titles of Concentration #1 (if any—use additional boxes for each concentration.): | Proposed Names and Course Titles of Concentration #1 (if any—use additional boxes for each concentration.): |
| **Current Total Program Units:** | **Proposed Total Program Units:** |

| | |
|---|---|
| Current Notes (if any) at the bottom of program catalog copy: | Proposed Notes (if any) at the bottom of program catalog copy: |
| **Section C-2—Course Changes:** Proposals for course elimination should complete the shaded (left) side only, proposals for course addition should complete the unshaded (right) side only, and proposals for program or course revision should complete both sides of Section B. Proposals involving only course additions, eliminations or revisions should complete only this section. | |
| Current course code and description (including units, prerequisites and grade type): | Proposed new course code and description (including units, course learning outcomes, prerequisites and grade type): |
| Course 1:<br>PSC 110 - Physical Science (GE) (3)<br>An introductory survey of selected principles in physics and chemistry with a discussion of related societal and environmental issues. (Meets a general education requirement; does not count toward the Chemistry or Physics major.)<br><br>Corequisite(s): PSC 110L and MTH 099 or equivalent. | Course 1: **Text** |
| Course 2:<br>PSC 110L - Physical Science Laboratory (GE) (1)<br>An inquiry-based laboratory that is a co-requisite for PSC110. Offered every year.<br><br>Corequisite(s): PSC 110 | Course 2: **Text** |
| Course 3:<br>PSC 103 - Earth Science (GE) (4)<br>An introductory survey of the disciplines of geology, oceanography, meteorology, and astonomy with discussion of philosophical and societal issues. (Meets a general education requirement; does not count toward any Chemistry or Physics majors.)<br><br>Prerequisite(s): MTH 099 or equivalent. | Course 3: **Text** |
| | Course 4:<br>PSC 111 - Physical Science for Teachers (GE) (4)<br>An introductory survey of selected principles in physics and chemistry with a discussion of related societal and environmental issues. This course focuses on topics necessary for the California multiple subject teaching |

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| | credential (K-8). This class is highly interactive and will make use of many hands on activities. (Meets a general education requirement; does not count toward the Chemistry or Physics major.)<br>Co-requisite: MTH113 College Algebra or equivalent<br>Grading: Letter<br>Learning Outcomes:<br>Upon completion of this course you should be able to:<br>**1.** Explain everyday observations of the natural world in terms of chemistry and physics.<br>**2.** Translate the description of problems into the equations required to solve them using relevant physical principles.<br>**3.** Find solutions to problems once appropriate equations or techniques are identified.<br>**4.** Create and interpret graphical representations of quantities (motion graphs, standing waves, etc.)<br>**5.** Gather and interpret data in a lab setting.<br><br>GELO 1e. Quantitative Reasoning: Students will be able to solve problems that are quantitative in nature |
| | Course 5:<br>PSC 112 - Earth and Space Science for Teachers (3)<br>An introductory survey of the disciplines of geology, oceanography, meteorology, and astronomy with discussion of philosophical and societal issues. This course focuses on topics necessary for the California multiple subject teaching credential (K-8).<br>Prerequisite(s): PSC111<br>Grading: Letter<br>Learning Outcomes:<br>Upon completion of this course you should be able to:<br>**1.** apply basic scientific principles to address Earth science questions and make informed<br>**2.** decisions about scientific matters likely to confront educated citizens;<br>**3.** explain everyday observations of the natural world in terms of planetary processes;<br>**4.** apply an evidence-based, logical, scientific |

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| | approach to ask and address questions about our planet and solar system;<br>**5.** articulate the relevance of Earth Science to individuals and to society;<br>**6.** solve problems relevant to introductory Earth Science and interpret solutions. |
| | Course 6:<br>PHY113 - The Physics of Sound and Music (GE) (3)<br>An introduction to the science of sound, hearing and music. The course will focus on concepts of sound production, propagation, and perception including topics such as musical scales, instruments, and acoustics.<br>Co-requisite MTH099 or equivalent, PHY113L<br>Grading: Letter<br>Learning Outcomes:<br>**1.** Students will create and interpret graphical representations of physical quantities<br>**2.** Students will understand the behaviors of waves and their role in areas such as sound production, musical instruments, and hearing.<br>**3.** Students will collect, organize and analyze data in a lab setting<br><br>GELO 1e. Quantitative Reasoning: Students will be able to solve problems that are quantitative in nature |
| | Course 7:<br>PHY113L - Physics of Sound and Music Lab (GE) (1)<br>A lab course designed for a hands-on exploration of the physics of sound.<br>Co-requisite PHY113<br>Grading: Letter<br>Learning Outcomes:<br>**4.** Students will create and interpret graphical representations of physical quantities<br>**5.** Students will understand the behaviors of waves and their role in areas such as sound production, musical instruments, and hearing.<br>**6.** Students will collect, organize and analyze data in a lab setting<br><br>GELO 1e. Quantitative Reasoning: Students will be able to solve problems that are quantitative in nature |

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| | Course 8:<br>CHE102 – Chemistry in Our Everyday Lives (GE) (3)<br>An introduction to basic principles of chemistry as they apply to our everyday lives. The course will include discussions on the chemistry of one or more major topics chosen by the instructor. (Possible topics include cooking, forensic science, health and nutrition, sustainable energy, or climate and the environment.)<br><br>Co-requisite MTH099 or equivalent, CHE102L<br><br>Grading: Letter<br><br>Learning Outcomes:<br>1. Students will understand the difference between elements, compounds and mixtures, and identify examples of each.<br>2. Students will learn principles of chemical reactions pertaining to practical everyday applications.<br>3. Students will learn modern techniques for analyzing the chemical composition of materials and apply this understanding to analyze samples.<br>4. Students will collect, organize and analyze data in a lab setting.<br><br>GELO 1e. Quantitative Reasoning: Students will be able to solve problems that are quantitative in nature |
| | Course 9:<br>CHE102L – Chemistry in Our Everyday Lives Lab (GE) (1)<br>A lab course designed for a hands-on exploration of basic principles of chemistry as they apply to our everyday lives.<br><br>Co-requisite CHE102<br><br>Grading: Letter<br><br>Learning Outcomes:<br>1. Students will understand the difference between elements, compounds and mixtures, and identify examples of each.<br>2. Students will learn principles of chemical reactions pertaining to practical everyday applications. |

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| | 3. Students will learn modern techniques for analyzing the chemical composition of materials and apply this understanding to analyze samples.<br>4. Students will collect, organize and analyze data in a lab setting.<br><br>GELO 1e. Quantitative Reasoning: Students will be able to solve problems that are quantitative in nature |

- **Step 2:**
  - Arrange a meeting: Arrange a meeting with the APC chair to review the completed portion of the proposal and to receive assistance from the Records liaison in submission of current and/or draft proposed catalog copy called for.
  - Attach Catalog copy:
    - For proposed revisions to existing programs, majors, minors, courses, etc, after this page attach the following supplied by Records: 1) The current year catalog copy for that program, major, etc, and 2) the proposed revised catalog pages for your proposal, based on the information from Step One.
    - For entirely new programs, majors, minors, courses, etc, after this page attach the draft new catalog pages for your proposal supplied by Records based on the information in Step One.

STEP TWO: ATTACH CURRENT AND/OR PROPOSED CATALOG COPY AFTER THIS PAGE AS SEPARATE PAGES.

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## SECTION FIVE: SUMMARY CHECKLIST

**Review course and staffing impact with your academic unit's direct report (College Dean or Provost).**

- **Total course additions: 6**
- **Total course deletions: 3**
- **Total unit additions: 17**
- **Total unit deletions: 18**
- **Staff impact (increase or decrease): 0**
- **Rotation of courses or deletions of sections to accommodate additions: see below**

Unit Computations:

Deletions of teaching load units:
PSC110 (2 sections per year x 3 units = 6 units)
PSC110L (4 labs per year x 2 units per lab = 8 units)
PSC103 (1 section per year x 4 units)
18 teaching units

Additions:
PSC111 (1 section x 4 units = 4 units)
PSC112 (1 section x 3 units = 3 units)
PHY113 (1 section x 3 units = 3 units)
PHY113L (1 lab x 2 unit = 2 units)
CHE102 (1 section x 3 units = 3 units)
CHE102L (1 lab x 2 unit = 2 units)
17 teaching units

**I have reviewed this proposal and the items above and believe the proposal meets all university requirements and is ready for APC review.**

**Department or School Direct Report: Maria Zack**

Holly Irwin _____ **Date** 11.14.16

**College Dean or Provost as applicable**