Physics Major Portfolio Cover Sheet

Student name:
Date:

Physics Degree Program (select one):
[ ] Physics B.S., standard track
[ ] Physics B.S., Biophysics Specialization
[ ] Physics B.S., Physics/Engineering Dual Degree track
[ ] Physics B.A.

Major Outcomes. The graduate will:	Artifact	Evaluation
Goal 1: *Content Knowledge* – demonstrate a comprehensive knowledge base of the major areas of physics and related disciplines.		
A. Required physics classes. Select and write a reflection on a graded artifact (e.g., homework assignment, test, report) from a 300- or 400-level required physics course that you think best demonstrates the learning outcome of knowing key physical concepts and applying them to analyze and interpret the behavior of physical systems. The artifact you select should be from an upper division physics class that is required in your physics degree program.		
B. Elective classes. Select and write a reflection on a graded artifact (e.g., homework assignment, test, report) from one of the listed elective classes that you think best demonstrates the learning outcome of knowing key physical concepts and applying them to analyze and interpret the behavior of physical systems. The artifact you select should be from an **elective** upper division physics class, such as PHYS 301, 303, 304, 322, 323, 334, 410, 433, 441, 454, 475. (For students in the Biophysics Specialization, PHYS 322 and 323 are not considered electives.)		
Goal 2: *Technical Skills* – perform experimental, computational, and analytical techniques in solving physics and physics-related problems.		
A. Experimental skills. Select and write a reflection on a graded lab report from one of the upper division physics lab classes that you think best demonstrates the learning outcome of applying experimental methods. Applying experimental methods generally involves applying a multiple component apparatus and/or multiple instruments; applying physical models in the experimental context; developing and applying methods and procedures to achieve an experimental goal; and analyzing, interpreting, and reporting results. Upper division physics lab classes include PHYS 303, 306, 323, 331, 333, 334, 433, 454.		
B. Computational skills. Select and write a reflection on a graded artifact (e.g., lab report, homework, computational in-class activity) from one of the listed upper-division physics classes that you think best demonstrates the learning outcome of applying computational techniques in solving physics and physics-related problems. Computational physics applications can include representing data visually; translating a model into code; debugging, testing, and validating code; and extracting physical insight. The artifact you select should be from one of the following upper division physics classes: PHYS 322, 331, 333, 351, 361, 451, 461.		
C. Analytical skills. Select and write a reflection on a graded artifact (e.g. homework assignment, test, report) from an upper division physics class of your choice demonstrating that you have met the learning outcome of applying analytical techniques to solve physics and physics-related problems. The application of analytical skills in physics involves implementing mathematical methods to extract insight from a model of a physical system.		
Goal 3: *Research skills* – apply content knowledge and skills from physics and related disciplines in a mentored undergraduate research project. Select and write a reflection on an artifact from your faculty-mentored undergraduate research experience. The artifact could include a project report, a print-out of a SOURCE presentation, or any other culminating product of your research project. In preparing your reflection, consider that research skills may include applying content knowledge to an original project; reading and referencing scientific literature;		

formulating a research goal; applying research methodology to address project goals; and disseminating your results.		
Goal 4: *Communication Skills* – communicate scientific ideas effectively.		
A. Oral scientific communication. Select an artifact associated with an oral presentation in which you communicated scientific ideas and write a reflection statement describing ways in which your presentation demonstrated effective oral scientific communication. In preparing your reflection, consider that effective oral presentation skills include "knowing your audience" and adapting your explanations to be accessible to non-experts; exercising judgment to determine which content to include within a limited time allocation; framing the "big picture"; and delivering the presentation in an organized and clear manner. Examples of oral scientific communication might include presentations at SOURCE or another conference (posters or talks), a formal presentation in a physics class, a planetarium show or other public presentation.		
B. Technical writing. Select and write a reflection on a sample of technical writing you performed for an upper division course or for some other relevant experience during your undergraduate physics program, and that you think best demonstrates the learning outcome of communicating scientific ideas effectively. Technical writing is intended to communicate primarily with those who have general expertise in the field of its topic and requires a deliberate revision, and often review, cycle. Examples of technical writing might include lab reports from upper division physics classes, grant or project proposals, technical project reports, abstracts for SOURCE or other conferences, manuscripts prepared for publication.		
Goal 5: *Civic Engagement* – promote scientific literacy to the broader community. After engaging in a public scientific outreach event, complete the Physics Outreach Form, request a signature from a participating faculty or staff member, and include this form as your Goal 5 artifact and reflection. In your reflection, describe your role in the outreach activity and discuss how this activity helped promote scientific literacy to the broader community.		

Explanation of the criteria

E – Exceeds standard means the artifact and reflection: 1) clearly address the outcome, 2) are exceptionally well presented, and 3) provide overwhelming evidence that the student has met the outcome.

M – Meets standard means the artifact and reflection: 1) clearly address the outcome, 2) are well presented, and 3) provide sufficient evidence that the student has met the outcome.

F – Fails standard means the artifact and reflection are not included OR 1) do not address the outcome OR 2) are not well presented OR 3) do not provide sufficient evidence that the student has met the outcome.

Definitions

Artifact: A record of work you created to fulfill a requirement of a CWU Physics course. Examples include (but are not limited to) homework assignments, class projects, exams, SOURCE presentations. Each goal in the portfolio will require one or more artifacts. Artifacts associated with collaborative work may be used, but the reflection statement must clearly articulate your role in preparing the artifact.

Reflection statement: Describe and explain how your chosen artifact demonstrates that you have met the associated goal. In your reflection statement for each artifact: (i) identify which course the artifact came from, (ii) briefly summarize the problem you were tasked with solving or the goal of the assignment, and (iii) discuss how this artifact is a good example of your ability to meet the goal. Each goal has specific guidelines for what should be included in the reflection statement. The grade or score received for the artifact should not be a significant component of your reflection.