PHYSICS DEPARTMENT auGDC CERTIFICATION DOCUMENT

List of classes that provide the foundation for potential projects—with justification for skills taught

The university UGDC requires 9 credits for graduation with Distinction in Undergraduate Research or Creative Works. Physics majors graduating with this distinction will choose from the following classes (as justified below) to meet this requirement:

- No courses already required for the Physics major will be counted towards graduation with distinction. Instead, these credits will be earned via elective courses meant to round out students' specialization, including research-focused courses and content-based courses.
- 6 or more credits to be earned via
    - PHYS 489R Undergraduate Research in Physics
    - PHYS 499A Senior Project
    - PHYS 499B Senior Thesis
    - HONR 498R Honors Thesis (for students enrolled in the honors program)
    - Each of the above courses will be guided by each students' research advisor. Via these courses, students will learn skills specific to their research project and will have the opportunity to report their results.
- Up to 3 credits can be selected with the students' research advisors' recommendations. The purpose of these credits will be to round out content knowledge or skills specific to each students' research specialization. These courses cannot come from courses required for the major (as stated above). Example courses could include but are not limited to PHYS 4350 Research Methods in Physics, ASTR 4350 Research Methods in Astrophysics, PHYS 4150 Medical Physics, PHYS 4700 Acoustics, PHYS 492R Topics in Physics (i.e. Biomedical Optics—a CURE course). Courses are not limited to courses within the Physics Department and can come from complimentary disciplines.

Guidelines and procedures for student-mentor relationships

Mentors will meet with the student regularly throughout the entire project. It is recommended that they meet weekly or more frequently when possible. When the student has decided to seek a Distinction in Undergraduate Research or Creative Works, they will communicate this intent with their advisor who will have them sign the department's letter of intent.

While it may be needful for the student to do research with their advisor for a time to become familiar with the field, as soon as possible the mentor and the student will together decide on a research goal for the student. The student will then develop a proposal consistent with the university research distinction guidelines. Feedback will be given by the advisor and revisions will be made until the advisor is satisfied with the proposal.

At this point the student will submit the written proposal and give an oral presentation on the proposed work to an audience consisting of the advisor, a member of the department committee, and others as desired by the student and approved by the advisor (this could include other students doing research in the lab, etc.). The prospectus will be approved if the project is deemed sufficient for distinction, is attainable and if the student is adequately prepared to carry out the proposed work. If the proposal is rejected, the student and the advisor can work together to produce a revised or different proposal and repeat the process.

In addition to advising the student, the mentor will help the student obtain any resources needed to complete the research. The mentor will give the student advice and help them find opportunities to present their work at conferences or through written manuscripts. They will help them find the resources necessary to present their work, such as funds to register for and travel to conferences, publication fees, etc.

List of names of the auGDC committee members

- Vincent Rossi (Chair)
- Dallin Durfee
- Christian Draper
- Vern Hart
- Physics Department Chair (currently Bonnie Andersen)

A Declaration of Intent that students will sign to participate in the program

After reading the below and affirming interest in pursuing the graduation distinction in undergraduate research and creative works in Physics, which recognizes students who have completed advanced scholarly or creative endeavors above and beyond the requirements for a university degree through independent effort, complete the Declaration of Intent From - which can be found at https://www.uvu.edu/college-of-science/resources/graduate_distinction.html - doing so affirms that you understand and agree to the following:

- ☐ I understand this program requires a minimum of two semesters and is expected to require three or four in most cases.
- ☐ I understand that I am required to submit a research prospectus outlining my intended project, which must be approved by my research advisor (a tenure-track or tenured faculty member). Additional details regarding the prospectus can be found at the end of this document.
- ☐ I have identified a research advisor.
- ☐ This individual has agreed to serve as a mentor and provide the needed guidance to ensure successful completion of the project.
- ☐ I understand my project will likely require 3-10 hours per week and am able to commit to this expectation.
- ☐ I understand that I must complete 9 credits of approved research coursework, with up to 3 credits coming from a non-required (elective) course approved by my advisor.
- ☐ I understand that I must present the results of my work at 2 independent research conferences, one of which must be external to UVU.
- ☐ I understand that I will be encouraged to present my work during part of a colloquium presentation given in the physics department.
- ☐ I understand that I will be required to meet with my advisor and at least one member of the graduation distinction committee to review my progress each semester.

Additional details regarding the prospectus:

An undergraduate research project and proposal must include

- Problem statement
- Background of the problem
- Project goal statement, including objectives
- Summary of methods
- Work completed to date, if applicable
- Planned outputs
- Literature Review
- Project timeline

A suggested timeline based on the general timeline for the Graduation Distinction in Undergraduate Research and Creative Works

First Semester	Second Semester	Third Semester	Fourth Semester	Final Semester
Identify a research Mentor or Professor and begin research project Begin taking research credits	Submit research prospectus for review Continue taking research credits	Continue taking research credits First presentation	Finish taking research credits Second Presentation	Present at Physics Colloquium Submit final application for certification to auGDC Submit request for graduation cord