

Application for a New Course v9

Course ID <i>Subject and Number</i>	PHYS497
Date APPROVED	
Date DENIED	

I. Systems and Catalog Information Complete each item.

1	Course Developer	Paul Morris, Jess Dowdy, Tim Head
2	Course Teacher	A member of the Physics Department faculty
3	Course Title	Physics Capstone I
4	Course Abbreviation (if title is over 30 characters)	NA
5	College	College of Arts and Sciences
6	Department	Physics
7	Number of Credit Hours	2
8	Is the course Fixed Credit or Variable Credit?	Fixed Credit
9	Is the course repeatable?	No
10	Maximum number of times course may be repeated	Zero
11	Maximum number of hours credit	2
12	Explanation for variable credit	NA
13a	Course contact hours - LEC	0
13b	Course contact hours - Lab	0
13c	Course contact hours - Practicum	0
13d	Course contact hours - Seminar	2
13e	Course contact hours - Studio	0
13f	Course contact hours - Online	0
13g	Course contact hours - Colloquium	0
13h	Course contact hours - Field Experience	0
13j	Course contact hours - Internship	0
13k	Course contact hours - Research	0
13m	Course contact hours - Workshop	0
13n	Course contact hours - Other	0
14	Instructor Workload	2 hours
15	Grade Mode (check all appropriate):	☒ Standard ☐ Credit/No Credit (undergrad only)
16	Maximum Enrollment	15
17	Catalog Description (50 words or less)	The first of a two-course capstone sequence, including topics in ethics, history of science, the relationship of faith and science, research plan development, and professional preparation.
18	List any prerequisites (course/s, test scores, class standing, major, etc.)	The student must be a physics major of senior standing, prepared to graduate either the following May or December one year from the completion of this part of the Capstone. At least concurrent with PHYS363.
19	List any co-requisites	None
20	If the course is cross listed, specify the Course ID(s) MUST have signature in Section V off all Department Chairs	NA

21	Does this course have any special student costs? Yes/No <i>Attach a <u>completed</u> "Request to Add or Change Course Fees" form. Describe in section IV-F.</i>	No
22	How often will it be offered? Fall	Fall
23a	How often will it be offered? Spring	
23b	How often will it be offered? Summer	
23c	How often will it be offered? Fall	Fall
24	Frequency?	Every year
25	First semester this course will be offered <i>New courses may not be taught under their approved course ID until they appear in the catalog, therefore, no earlier than the coming fall.</i>	Fall 2013
26	List course/s that should be deleted, include the last semester for course/s being deleted <i>A course cannot be deleted when it is a requirement in a degree plan in any department.</i>	None
27	Is this course required for a degree/s? Yes/No <i>If "Yes," attach a revised degree plan(s) reflecting the placement of the new course.</i>	Yes
28	Has this course been offered as a Special Topics course? Yes/No <i>If "Yes," specify the Course ID and enrollment for each term it was taught.</i>	No
29	List any courses in which content overlaps the proposed course. (Course ID and Name)	None

II. Curriculum

1	Degree Plan Explanation of how this course affects degree requirements.	The 4 additional hours for the Capstone sequence (2 each for PHYS 497 and PHYS 498) will be offset by the elimination of the General Chemistry II requirement: CHEM 132 (1) and CHEM 134 (3).
2	Justification State the justification for adding this course to the current curriculum.	With the implementation of the New Core, all majors must have a Capstone experience. Our experience will be a two-semester sequence, this being the first semester course.

III. Course Design

1. Audience and Course Goal

1	Describe the intended audience, including prerequisite skills.	See I.18. The students will be graduating seniors with most of their physics and mathematical requirements satisfied.
2	State the overarching course goal(s) in performance terms.	1 Demonstrate an under-

		standing of some important episodes in the history of physics. 2 Demonstrate an understanding of ethical issues that arise in the course of the life of a scientist. 3 Demonstrate an understanding of the relationship of faith to the student's life as a scientist. 4 Read and analyze physics publications, both good and bad. 5 Develop a plan of action for a research project. 6 Develop an accomplishments inventory reflecting the student's scholarship, research, co-curricular activities, service, leadership, internships, integrative thinking, etc.
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2. Competencies and Measurements

	Competency	Measurement
1	Develop an accomplishments inventory reflecting the student's scholarship, research, co-curricular activities, service, leadership, internships, integrative thinking, etc.	Grading of a resume – the final copy submitted Week 6.
2	Demonstrate an understanding of some important episodes in the history of physics.	Graded questions on the Final Exam.
3	Demonstrate an understanding of ethical issues that arise in the course of the life of a scientist.	Graded questions on the Final Exam.
4	Demonstrate an understanding of the relationship of faith to the student's life as a scientist.	Graded questions on the Final Exam. Graded essay for the Writing Intensive requirement – Week 14.
5	Develop a plan of action for a research project.	Graded Project Proposal due Week 13.
6	Read and analyze physics publications, both good and bad.	Graded class presentation Weeks 8 or 9.
7	Demonstrate the ability to integrate the liberal arts core curriculum and their major field, physics.	Graded questions on the Final Exam. Graded essay for the Writing Intensive requirement – Week 14.

3. Text and Resources

Faith and Reason, Internet Encyclopedia of Philosophy <http://www.iep.utm.edu/faith-re/>
 Reading Packet of Peer-Reviewed Science Publications [Including Albert Einstein's "On the Electrodynamics of Moving Bodies" and both *good* and *bad* examples of publications.]
Oppenheimer's Choice: Reflections from Moral Philosophy, Richard Mason (SUNY Press – Albany, 2006)
When Science Goes Wrong, Simon LeVay (Plume: Penguin Group, 2008)

SYLLABUS – PHYS497.01 – PHYSICS CAPSTONE I

Credit Hours: 2 hours of seminar.
Semester: Fall 2013.
Time/Place: TBS

Professor: Paul Morris, Ph.D.
Professor of Physics
Office: Foster Science Building, 317C E-mail: morrisp@acu.edu
Extension: 2165
Office Hours: TR 8:00-11:00, W 3:00-5:00, by appointment

Course
Content: Catalog description: The first of a two course capstone sequence, including topics in ethics, history of science, the relationship of faith and science, research plan development, and professional preparation.

Textbooks/Readings:

Faith and Reason, Internet Encyclopedia of Philosophy
<http://www.iep.utm.edu/faith-re/>
Reading Packet of Peer-Reviewed Science Publications [Including Albert Einstein's "On the Electrodynamics of Moving Bodies" and both *good* and *bad* examples of publications.]
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Format of Class Sessions:

The classes will be very informal with a few lectures. The primary learning context is Student faculty discussion and student presentations. At some times there will be solo work by the student with one-on-one faculty mentoring.

Christian Perspective:

Because we are exploring and trying to understand God's creation through physics, we try to inculcate in our students (in all of our classes) a sense of respect, awe, wonder, and humility toward nature. In this course specifically, we will explore the nature of *faith* and *reason* and moral implications of work in the sciences.

Outcomes, Competencies, and Measurements:

Outcomes/Competencies	Measurements (See Calendar)
Develop an accomplishments inventory reflecting the student's scholarship, research, co-curricular activities, service, leadership, internships, integrative thinking, etc.	Grading of a resume – the final copy submitted Week 6.
Demonstrate an understanding of some important episodes in the history of physics.	Graded questions on the Final Exam.
Demonstrate an understanding of ethical issues that arise in the course of the life of a scientist.	Graded questions on the Final Exam.
Demonstrate an understanding of the relationship of faith to the student's life as a scientist.	Graded questions on the Final Exam. Graded essay for the Writing Intensive requirement – Week 14.
Develop a plan of action for a research project.	Graded Project Proposal due Week 13.
Read and analyze physics publications, both good and bad.	Graded class presentation Weeks 8 or 9.

Demonstrate the ability to integrate the liberal arts core curriculum and their major field, physics.

Graded questions on the Final Exam.
Graded essay for the Writing Intensive requirement – Week 14.

Writing Intensive Work:

This is the Writing Intensive course for physics majors. The essay will follow the guidelines for Writing Intensive classes. The topic will be an interdisciplinary topic relating faith to the student's life as a scientist/physicist.

Grading Criteria:

Criteria for grading written papers and oral presentations:

A - Professional quality: The project is concise yet comprehensive, tightly reasoned in argument, well organized, easily understood, and virtually error free. The student demonstrates excellent knowledge of the topic. It fulfills the assignment guidelines with authoritative, current information and insightful analysis.

B - Good quality: The student manages to communicate knowledge of the topic without gross errors. The argument is generally logical and is supported with solid information.

C - Mediocre quality: Errors in information and incomplete knowledge of the topic distract or interfere with the argument or presentation. The coverage is spotty with few or less than solid sources. The argument contains invalid components.

D - Unacceptable quality: The topic coverage is watered-down and disorganized, with major errors in the project. Significant holes exist in the argument.

F - Failing quality: The student does not communicate understanding of the topic. It is undeveloped with many grammar errors and is unharmonious. The student did not do the assignment according to the guidelines.

Course assignments and evaluation:

Resume	15%	
Oral Presentation of Peer-Reviewed Paper		15%
Class Preparation, Participation	10%	
Research Project Proposal		30%
Writing Intensive Assignment		15%
Final Exam		15%
A	89.5-100	
B	79.5-89.4	
C	69.5-79.4	
D	59.5-69.4	
F	below 59.4	

COURSE POLICIES

Late work (assignments and exams) will be handles in the following ways:

Excused absence: On the *first* class day back after the absence, it is the student's responsibility to arrange with the professor an appropriate time to complete the work. If the student does not do this, the work will be handles according to the policy for unexcused absences.

Unexcused absence: If the work is completed within one week of the due date, there will be a 10 point deduction; i.e., if the student were to make a 79 on a late test, the recorded grade would be 69. If the work is completed later than one week after the due date, there will be a 25 point deduction.

Conduct in Class: Questions or observations, addressed to the entire class, are encouraged during the class period. If something is unclear, the student should immediately ask for clarification. However, the student is not to be a disruptive influence in the class. The following are the penalties for disturbing the class: The second time she/he is corrected will result in an unexcused absence. The third time she/he is corrected will result in a drop of one letter

grade on the final average. The fourth time she/he is corrected will result in dismissal from class with a failing grade.

Cell phones are not to go off in class! Grades will be reduced if they do. As you enter the classroom check to see that your phone is OFF!

Laptops or any other electrical device (iPhone, iPod, cell phone, etc.) are not to be in hand, on desk, or otherwise in use in class unless it is a part of that day's class activity! If this use is discovered, you will be counted absent on the day.

Academic Honesty: Violations of academic integrity and other forms of cheating, as defined in ACU's Academic Integrity Policy, involve the intention to deceive or mislead or misrepresent, and therefore are a form of lying and represent actions contrary to the behavioral norms that flow from the nature of God. Violations will be addressed as described in the Policy. While the university enforces the Policy, the most powerful motive for integrity and truthfulness comes from one's desire to imitate God's nature in our lives. Every member of the faculty, staff and student body is responsible for protecting the integrity of learning, scholarship, and research.

The full policy is available for review at the Provost's office web site (below) and the following offices: provost, college deans, dean of campus life, director of student judicial affairs, director of residential life education, and academic departments. (<http://www.acu.edu/campusoffices/provost>)

TENTATIVE COURSE CALENDAR (TCC)

The faculty reserves the right to change the TCC, however, changes will never be such to make assigned written work due earlier than the original assigned date. Readings under assignment are for the following week.

Week	Topic(s)/Work	Assignments
1	Syllabus. Resume discussion; student will prepare a personal resume to be turned in by the end of the first week class. Intro- Mason. Read Morris article for next week. Thinking about a research topic; a topic suggestion will be due Week 4.	Read by Week 4: <i>Oppenheimer's Choice: Reflections from Moral Philosophy</i> by Richard turned on the third week class. Begin duction to research proposal.
2	Discussion of the history of physics.	Rough draft of resume due next week.
3	Discussion of how to plan a research project.	First draft of resume due. Read <i>Oppenheimer's Choice</i> . A rough draft of the research proposal will be due Week 8.
4	Ethics and morality in the work of a physicist.	Topic for research project due. Graded first draft of resume returned.
5	Continue discussion of ethics/morality.	Final draft of resume due next week. Read Einstein's original paper that became known as the 'Special theory of Relativity.'
6	Discussion of the <i>good</i> and <i>bad</i> in peer-reviewed scientific publications.	Final draft of resume due. Read examples of peer-reviewed science publications.
7	Continue discussion of peer-reviewed publications.	Each student will select (in consultation with the science professor) a peer-reviewed article and prepare a 10-12 minute presentation next class period explicating and analyzing the publication. First draft of research proposal due next week.
8	Student presentations and discussions of science publications.	First draft of research proposal due.
9	Continue presentations and discussions of Week 8.	Graded first drafts of research proposal is returned.
10	Continued discussion on planning a research project.	Read article on <i>Faith and Reason</i> . Begin work on research project.
11	Discussion of <i>Faith and Reason</i> .	
12	Continued discussion of <i>Faith and Reason</i> .	Final research project proposal due next class.
13	Students discuss and critique each others proposals.	Prepare to write the 'Writing intensive Essay.' others research Students submit their research proposals. Students will be working on gathering all the materials required for their research project –Deadline: Week 15.
14	Write the 'Writing intensive Essay.'	
15	Mock interviews of students by faculty members. Discussion of any last minute problems associated with the research proposal and materials collection.	
Final	Final Exam	

PHYS497 – Physics Capstone I

IV Supporting Documentation

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| 1 | Library | Attached. |
| 2 | Adam's Center | Attached. |
| 3 | Degree Plan | There is no current Director of Curriculum; Jennifer in the Registrar's Office said to send this to CASAC for approval and then send it to her. |
| 4 | Content Overlap | NA. |
| 5 | Departmental Resources | NA. |
| 6 | Resources | We have the necessary computers and all of the lab equipment will be available to the students. |
| 7 | Expenses | There are no additional expenses. |
| 8 | Justification | NA. |
| 9 | Syllabus | Attached at the end of the course application. |