

Wright State University
Department of Physics
Senior Thesis Project Guidelines
Version 1
edited April 8th, 2014 by J. A. Deibel

WSU Physics Senior Thesis Project (PHY 4940) Syllabus

I. College/School COSM
Department PHYSICS

II. Course Information

Course Title: Senior Project

Course Abbreviation and Number: PHY 4940

Course Cross Listing(s) Abbreviation and Number:

Check (“x”) all applicable:

Writing Intensive Service Learning _____ Laboratory Laboratory Grade Separate _____

Ohio TAG (Transfer Assurance Guideline) Course _____ Ohio Transfer Module Course _____

III. Course Registration

Prerequisites: PHY 3500 Advanced Lab I, PHY 3510 Advanced Lab II

Corequisites:

Restrictions: Senior standing in Physics

Other: Permission of the department, Advanced Lab requirement can be waived in exceptional circumstances with and only with permission of the department.

IV. Course Objectives

This is a year-long capstone course in the physics program. Students must synthesize and apply conceptual understanding and practical knowledge gained from coursework to complete an extensive design/development/research project similar to one they might encounter as a working professional. Students who are successful in this course will have proven their ability to a) identify a problem that they have the ability to solve, b) utilize their skills developed in prior course work to solve a problem, c) analyze the results of a problem, and d) report the results of a problem to their peer group. This will require a literature search, laboratory and/or computer work, analysis and interpretation of results, progress reports, an extensive written final report, and a seminar presentation.

VI. Suggested Course Materials (required and recommended)

None. Materials will be recommended by the instructor and will be project dependent.

VII. Suggested Method of Instruction

Independent Study

VIII. Suggested Evaluation and Policy

Course requirements:

Because the senior project is intended to be a capstone experience for our majors, it is generally recommended that the student not begin their senior project before the summer preceding their senior year. It is also important for the student to evaluate if they have a sufficient background and/or experience for their proposed projects, especially whether the requisite upper-division courses have been completed or will be completed in time to benefit the student. These are the considerations that will be used by the Chair of the Undergraduate Studies Committee or Departmental Chair to evaluate the proposed project and approve registration into the Physics 4940 course.

Acceptable uses of time are: preliminary/background research, proposal preparation, planning, development, construction, implementation, programming, analysis, and report/presentation preparation. Not included in the above are regular meetings between student and advisor. If the student is using off campus work to satisfy the time requirements of this course, the student must get the permission of the Department Chair and the Senior Project Coordinator.

Course Grading

A: 90-100%, B: 75-89.9%, C: 60-74.9%, D: 50-59.9%, F: < 50%

All reports and presentations must be on a technical level that is understandable by someone with a general physics background, e.g., comparable to a Scientific American.

This course is a writing intensive class. Students will be expected to produce writing that

- Demonstrates their understanding of course content,
- Is appropriate for the audience and purpose of a particular writing task,
- Demonstrates the degree of mastery of disciplinary writing conventions appropriate to the course (including documentation conventions), and
- Shows competency in standard edited American English.

Grades will be assigned based on something similar to the following breakdown:

Research Proposal/Update: 5%

Research notebook: 15%

Progress Reports/Presentations: 15%

Final Written Report: 30%

Oral Presentation: 30%

Component	Description	Deadline
Proposal /Update	In the first semester, students must complete and submit a 1 page proposal documenting the goals and methods to be utilized involving the senior project. This proposal will be examined by the project advisor and revision recommendations made to the student. In the 2 nd semester, students must complete and submit a 1 page paper documenting progress to date on the project and the goals for the upcoming term. This document will be examined by the project advisor and	Draft proposal is due at the conclusion of the 2 nd week of the term, and the revised version due at the end of the 3 rd week. Draft update is due at the conclusion of the 2 nd week of the term, and the revised version due at the end of the

	revision recommendations made to the student.	3 rd week.
Research Notebook	Students will chronicle all aspects of their senior project in this bound notebook including progress, meetings, planning, data taking, analysis, etc.	Students must submit their notebook for review at mid-term at which point the advisor will provide feedback. The final notebook grade will be assessed when it is submitted on the last day of classes for that term.
Progress Reports	Students must submit a 2 page summary of progress on their projects including a project description, goals, work done to date, problems, future goals, analysis performed, etc. The project advisor will submit written feedback. It is recommended that this update include outlines of both the final paper and presentation.	Students must submit this report at mid-term.
Final Written Report	Students must complete a minimum 4 page report summarizing their senior project in the format of an academic journal which has been selected by the project advisor. At the conclusion of the first term, students must at least complete a draft of this document despite not having completed the project. Students will submit drafts of the final report and will receive written feedback from the advisor so that the students may submit a revised final draft.	Students must submit a draft version no later than the last day of classes for the given term. Students will have until the end of finals week to complete the revised final draft.
Oral Presentation	All students will give a presentation of their work to the department near the end of the second semester in which they complete their project.	The final presentation must be completed no later than finals week.

WSU Physics Senior Thesis Project (PHY 4940) Timeline

1. **Choosing an advisor.**

Deadline: No later than the start of the semester that you are enrolled in PHY 4940. If you are starting PHY 4940 in the fall, it is highly recommended that you nominally select an advisor before the end of spring term when you are in PHY 3510 (Adv. Lab II).

You need a thesis advisor. If you are unsure who to choose, you might want to visit the department web page and click on Research, which provides descriptions of faculty research. Visit with prospective advisors during their posted office hours or by appointment. Ask questions about what research they are doing and how you might become involved. Request a tour of any laboratory facilities that the professor uses. Talk to other students who are currently doing research with the professor. Keep in mind that establishing a connection with a professor is a two-way process: You must choose an advisor, but he/she must also choose you. If you wish to complete your project off-campus i.e. AFRL, AFIT, or a local company, or in another department, your on-site advisor and topic must be approved by the WSU Physics Department. Furthermore, you must still have a WSU Physics Faculty member serve as your co-advisor of record.

2. **Topic Development**

Deadline: No later than the start of the semester that you are enrolled in PHY 4940. If you are starting PHY 4940 in the fall, it is highly recommended that you nominally select an advisor before the end of spring term when you are in PHY 3510 (Adv. Lab II).

Your and your faculty advisor will work with you to develop the topic and goals of your senior thesis project. Once you have done this, you must complete the Application for Senior Thesis Project (attached). The Chair of the Undergraduate Studies Committee will either approve of your topic and description or provide feedback to you as how it might be changed in order to better the project and student experience.

3. **Enroll in PHY 4940**

Deadline: No later than the start of the semester that you are enrolled in PHY 4940. If you are starting PHY 4940 in the fall, it is highly recommended that you nominally select an advisor before the end of spring term when you are in PHY 3510 (Adv. Lab II).

Once you have selected your faculty/thesis advisor, you must enroll in the PHY 4940 for the coming term that you will be working on your senior project. Visit the Physics Dept. main office in 248 Fawcett Hall and the administrative staff will help you to enroll in the proper PHY 4940 section and instructor and credit hours. The norm is that you take 3 credit hours per term of PHY 4940 for two separate semesters. It is only under unique circumstances that students are allowed to complete their project over the course of one semester. Such situations will only be allowed following department consideration and approval. Most (99.9%) students should plan on spending one year working on their senior project.

4. **Review the Course Syllabus & Plan Your Project**

Meet with your faculty advisor and begin planning your senior thesis project. Review the attached PHY 4940 syllabus and note deadlines and deliverables. The final paper and oral presentation are not the only deadlines or deliverables for this class.

WSU Physics Senior Thesis Project (PHY 4940) Timeline (continued)

5. Schedule regular meeting times with your advisor

6. Do your Project

7. How to complete PHY 4940 and graduate?

- a. To complete PHY 4940 and graduate, you must complete a final written report (format to be decided upon by your advisor) and present an oral presentation to the department by the end of the academic term in which you plan to graduate.
- b. Approximately one month before the end of classes during the term in which you plan to graduate, schedule your oral presentation.
- c. Students must submit a draft version of the written report no later than the last day of classes for the given term. Students will have until the end of finals week to complete the revised final draft.

WSU Physics Senior Thesis Project (PHY 4940) Expectations

- This is an independent study project. Your advisor is there to guide you.
- You are responsible for keeping track of deadlines.
- You are expected to meet with your advisor on a very regular and frequent basis.
- You are responsible for utilizing self-discipline such that you can organize your schedule in order to make sure that you get your work done.
- $3 \text{ credit hours} \times 3 \text{ hours of work/credit hour} + 3 \text{ hours} = 12 \text{ hours of work per week}^*$
- *The more time that you can devote to your senior project = the better experience and results
- It is NOT an expectation that you will get paid for your time. This only occurs when you are participating in faculty research that is sponsored.
- **YOUR SENIOR PROJECT WILL BE AS GOOD AS YOU MAKE IT.**
- *You can expect that your faculty advisor will meet with you on a regular basis.*
- *You can expect that your faculty advisor will help you develop a senior thesis project that is*
 - a. *realistic based on the time that you have to complete the project*
 - b. *realistic based on the educational level that you are expected to have attained at this point in your undergraduate career.*
 - c. *realistic based on available resources.*
- *You can expect that your faculty advisor will be willing to revise project goals and expectations as warranted.*

If you have difficulties with your senior project that you feel are not being dealt with in a timely or proper manner, please consult the Chair of the Undergraduate Studies Committee or the Department Chair.

Resources

<https://www.physics.byu.edu/undergraduate/Docs/thesis.pdf>

<http://www.physics.unh.edu/undergraduate/programs/thesis>

<https://publish.aps.org/files/styleguide-pr.pdf>

<http://authors.aip.org>

**Wright State University Department of Physics
Application for Senior Thesis Project (PHY 4940)**

Student's Name _____

Date of Application _____

Student has Senior Standing in Physics (Required) Yes _____ No _____

**Student must have, at the very minimum, completed the following courses:
PHY 2400, 2410, 2420, 3500, and 3510.**

Description of Proposed Senior Thesis Project for Physics 4940:

of course hours of PHY 4940 student will register for: Fall _____ Spring _____

Projected Date of Completion: _____

Proposed Project Advisor (Co-Advisors As Needed): _____

Approved: _____ *Date:* _____

Chairman, Undergraduate Studies Committee

Comments:

