

Physics Senior Honors Thesis Information and Timeline

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Important links with thesis procedures and rules

Registrar: <https://registrar.lafayette.edu/additional-resources/honors-requirements/>

Catalog: <http://catalog.lafayette.edu/en/current/Catalog/Academic-Programs/Honors/Departmental-Honors>

Faculty Handbook: <http://provost.lafayette.edu>

Who can undertake a physics honors thesis?

(The following are college-wide rules that apply to all departments and programs; see faculty handbook § 7.7.2 and 7.7.3.)

Honors thesis work normally requires GPAs of 3.00 overall and 3.20 in Physics. GPAs must be maintained at these levels to receive honors. However, a member of the faculty can recommend students below these GPA cutoffs for thesis work by submitting letters from both the proposed thesis advisor and the Department Head to the Academic Progress Committee by April 1 of the student's junior year.

A student who is not a Physics major may do an honors thesis if they take at least five physics courses, including three at the 200 level or above. Thesis work itself does not count toward these course requirements. Such a student must petition the Academic Progress Committee in order to undertake a Physics thesis.

Registering for a thesis

Thesis is PHYS 495 (fall) and 496 (spring). These count as standard classes for purposes of graduation, major requirements, etc. They are writing courses: taking both 495 and 496 together counts as one W course. Normally students register for PHYS 495 near the end of junior year, when signing up for classes for fall of senior year. Students should arrange for a thesis advisor at this time. Permission is required to register for thesis courses, and the Registrar must set up an individual section of PHYS 495. At Registration time, the thesis advisor should send an Email to the Registrar, cc'd to the Department Head, requesting that a section of PHYS 495 be set up and asking the Registrar to place the student in that section (or giving that student permission to register for it.)

Students register for PHYS 496 when signing up for class for spring of senior year. The procedures are similar to PHYS 495, i.e., the advisor sends Email to the Registrar. It is a college requirement that a grade of "A" be obtained in the first semester of thesis work in order to continue into the second semester of thesis work.

How to find an advisor and thesis topic.

Knock on a lot of doors! Students should speak to any faculty with whom they might be interested in working. There is no department-wide process for connecting students and advisors; it is all done on a one-by-one basis. Students should consult with their advisors and the Department Head for further guidance in this process.

Thesis advisors are normally faculty within the Physics Department, but it is possible for others to act as advisors. Theses at Lafayette are typically done within one department or program, but it is possible for a thesis to span two different departments, potentially with multiple advisors. Consult with the Department Head for further guidance on these and related topics.

Typically, thesis work is related to the advisor's research program, with a specific project within that program chosen for the thesis by mutual agreement of student and advisor. Other thesis topics are possible (outside the existing research areas of faculty, or proposed by students) but must be agreed to by the thesis advisor.

The thesis is not paid work: the student cannot be paid by EXCEL or another funding source. However, thesis work may build on EXCEL or other previous research work done by the student. It is common for an EXCEL student to continue into thesis work with the same advisor.

Thesis committee

A student's thesis committee consists of the thesis advisor, one other member of the Physics faculty, and one faculty member from another department. The student and advisor should discuss membership of the committee, and the student should contact proposed members to see whether they agree to be on the committee. Ideally, the committee will be selected at the start of the senior year; in any case, it must be selected by the time of the first student presentation, late Fall semester.

Expectations for work and effort level

Thesis counts as a class, and the effort level should be at least that of other classes. A typical commitment is around 12 hours per week.

Meetings between advisor and student

It is up to the advisor and student to determine how often they will meet and what means they will use to interact. There are wide variations depending on the circumstances of the thesis work (e.g., whether or not the thesis involves experimental lab work). It is often useful to set at least one or two regularly scheduled weekly meeting times.

Expectations for the written thesis

Lengths and styles of physics thesis vary widely depending on the research area. Examples of theses are available in the Physics Student Lounge, in Skillman Library, and from the Department Head.

Typical lengths are 40-80 pages. Long page counts are particularly common for theses with large numbers of tables or figures (especially experimental data). Since the thesis counts as a “W” course, there are College requirements regarding the minimum amount of writing.

The thesis should be written at a level that makes it accessible to an undergraduate senior physics major. It can be assumed that the reader has a core knowledge of classical mechanics, electromagnetism, quantum mechanics, etc., but it should be assumed that the reader does not have extensive knowledge of the particular subfield in which the research was done, so concepts and terminology related to that subfield should be explained, typically in an introductory chapter.

The thesis should have an abstract, table of contents, introductory chapter(s), chapters on the research and analysis work undertaken, a conclusion chapter, and a bibliography. Lengthy technical content (for example, computer code), is often best relegated to an appendix.

There are no mandatory formats for tables, citations, bibliography, etc., but these should match the conventions of the particular subfield in which the research was done (i.e., the conventions used by journals in that field).

The thesis can be done using any word processing software capable of neatly produced text, mathematics, tables, and figure placement. Use of LaTeX is common, but not required.

Thesis timeline

Events in this timeline related to outlining and writing the thesis may be modified at the discretion of the thesis advisor.

Spring of junior year:

- Arrange for a thesis advisor
- Register for PHYS 495 for fall of senior year

Beginning of fall semester senior year:

- Decide on specific topic of study, if not done already
- Begin research
- Meet regularly with thesis advisor
- Arrange thesis committee

Middle of fall semester:

- Develop outline of proposed thesis, if not done already
- Begin a thesis document (at a minimum containing the outline)

End of fall semester:

- Register for PHYS 496 for spring of senior year
- Oral presentation, 20-30 minutes, to the Physics Department (faculty, students, etc.). This could be a review of background material or a progress report on work done to date.
- Write a draft document on the background material on the thesis topic. Typically this will be the first chapter of the thesis.
- Grade for PHYS 495 submitted by the Department Head.

Middle of spring semester:

- Advisor fills out Preliminary Honors Thesis Nomination Form by the end of the third week of classes.

End of spring semester:

- Written thesis due to the advisor two weeks before the end of the semester (college rule).
- Shortly after submitting to the advisor, and with the approval of the advisor, copies of the thesis are distributed electronically (or on paper if requested) by the student to the thesis committee and to all Physics faculty members. The advisor is not expected to fully review the thesis at this time, but rather to confirm that it is in a suitable state to distribute to others before the student does so.
- Oral presentation (30-45 minutes plus questions) to the Physics Department. The first part of this presentation is open to the public (faculty, students, or anyone), and it is followed by a closed session (attended only by faculty). This is typically in the first week of finals week, but could in principle be done earlier. It must be done in time to meet the Final Honors Thesis Nomination Form deadline (see below).
- Committee members and Department Head sign Final Honors Thesis Nomination Form.
- Advisor submits the Final Honors Thesis Nomination Form to the Registrar. The deadline for this in recent years has been either noon the Friday of the first week of finals or Monday of the second week of finals.
- Grade for PHYS 496 submitted by Department Head
- Faculty reading the thesis often suggest changes. Students may make corrections to their theses after presentation, and are encouraged to do so.
- A final copy of the thesis should be submitted to the library by the advisor.
- If printed copies are desired, the advisor arranges this through the department secretary..
- There is a college-wide honors thesis ceremony, normally in the days leading to commencement.