Capstone Degree Requirement Options in the Time of COVID-19

Below are a number of ways to meet the 3-credit capstone graduation requirement for the applied or comprehensive degree options. It is possible to mix and match for your total of 3 credits. The biophysics option requires research on a bio-related project; the teacher preparation option requires either PHYS 401-2-3 or a pedagogy-related research project. The over-riding principle for the capstone requirement is that you independently apply knowledge and skills from the physics curriculum outside a typical classroom.

1. **Research for credit.** There are fewer opportunities currently than when the university is meeting in person, since it is not possible to do hands-on training while maintaining social distance. However, remote research opportunities still exist. The process to find projects is the same as before – individually contacting a professor to set up a proposed plan of activities. Examples of remote projects include data analysis, design of new equipment and experiments, analysis software development, pursuing and summarizing literature searches, and revamping a group's website. Students can also work with faculty on pedagogical projects, for example developing new online modules for courses. Additionally, faculty can supervise an independent project you propose (e.g., building something in your garage). PHYS 499 or ASTR 499 credits automatically count towards the degree.
   - A research experience in another department or off-site can also fulfill the physics capstone requirement. It requires documentation and assignable credits as described here.

2. **Team Project Participation.** Participation in various engineering teams such as robotics, human powered submarine, Formula, SpaceX, etc. can count for your capstone requirement. It requires documentation and assignable credits as described here.

3. **Off-site Internship.** Participation as an intern or employee in a technical job can also be used for your capstone requirement. If the job does not involve physics explicitly, it must be combined with 1-2 credits of a physics capstone option to complete the capstone requirement. It requires documentation and assignable credits as described here. If you need CPT approval, contact Prof. Olmstead well in advance of your start date.

4. **Directed Reading in Physics course (PHYS 498).** See https://sites.google.com/uw.edu/drip. This new course pairs undergraduates with graduate student research guides to critically engage with advanced academic literature and to clearly communicate scientific material. Either a 1 or 2 credit class. Applications are generally open about one month before the start of the quarter.

5. **Physics Pedagogy and Undergraduate Learning Assistant course (PHYS 401-402-403).** These new 3-credit classes are connected with the 121-122-123 series and train undergraduates to be a learning assistant in introductory laboratories and tutorials while also teaching general strategies for physics pedagogy and classroom management. Applications are generally open about one month before the start of the quarter. In future quarters, these courses will be a required prerequisite for undergraduates to be hired as teaching assistants.

6. **Senior Seminar (PHYS 494-495-496).** These 1-credit seminars engage students in the current literature and topics of interest in physics by having them create a presentation and learn from hearing the presentations of others.

Information about how an out-of-department experience can be used to meet the capstone requirement:

For your non-physics-department activity to count for your capstone requirement you need to submit a 3-5 page paper to ufaphys@uw.edu demonstrating how you spent at least 30 hrs/credit independently applying skills and knowledge from the physics curriculum outside the standard classroom. Your paper should detail what you accomplished/learned, and also spend a couple of paragraphs highlighting how your physics education was relevant. Your supervisor (someone with at least a bachelor's degree) must
email ufaphys@uw.edu a short note saying they have read the paper and agree it summarizes your work.

If your project contains sufficient physics, the project can meet all three capstone credits. If it used skills and knowledge that will be useful in a future career, but not explicitly physics (e.g., developing code, fund raising, machining someone else's design), then it can count for at most two credits and must be combined one or two credits of PHYS 49x to complete the requirement.

It is necessary to have actual credits to associate with the capstone requirement on DARS. This can be either a 299/499 course in another department or an extra course meeting the physics advanced elective requirements. The department will be applying this year to create a course number for off-site internships; until this is approved, contact Prof. Olmstead about other options.

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Source URL: https://phys.washington.edu/capstone-options