Undergraduate Frequently Asked Questions (FAQ)

On this page you will find answers to some of the most Frequently Asked Questions by students.

The UW Physics Student Services group includes:

- Undergraduate Advisor -- Academic Counselor Margot Nims.
- Graduate Advisor -- Academic Counselor Catherine Provost (who is also happy to meet with undergraduate students, especially those with an interest in graduate school),
- Undergraduate Faculty Advisor (UFA) -- Professor Marjorie Olmstead,
- 11x/12x Program Coordinator -- Susan Miller,
- Student Services Program Assistant -- Paula Newcomer.

We can be found in Physics-Astronomy Tower C139. Contact information can be found on the Student Services page.

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Answers

General Information about the Physics Programs

1. What can I do with a degree in physics?

   Answer: Physics is arguably the STEM major that leaves open the largest number of possible careers. From physics professor to patent lawyer to video game creator to congressional staff, a training in physics prepares you to solve complex problems, augmented with a deep understanding of how the inanimate world behaves and interacts. Recent graduates are in a huge variety of positions, whether in academia, industry or government, and with or without additional schooling beyond the bachelors degree. Nationally, just over half of physics bachelors go on to further schooling in physics (32%) or other fields (22%) before joining the workforce; locally, that fraction of UW graduates is closer to 35-40%. To learn more about career options with a physics major, the American Physical Society and National Society of Physics Students have a host of useful information. A list of companies in the state of Washington that have hired physics bachelors may be found here at the American Institute of Physics website; a host of other data gleaned from the annual survey of physics bachelors may also be found on their site (aip.org/statistics).

2. I wish to be a physics major. Where do I go to find out more about this program?

   Answer: You will find lots of useful information on the Undergraduate page of the UW Physics website. You will find links to information about requirements, declaring a major, career planning, honors -- in short, almost everything you would ever want to know about becoming a Physics major at UW. In particular, you will want to decide which degree option to pursue - Applied Physics, Comprehensive Physics, Biological Physics or Teaching Physics. You can also read the rest of this FAQ file.

   We also welcome you to visit with us in Physics Student Services to ask questions and learn about the program.

3. What mailing lists are there for students interested in physics? How do I join them?

   Answer:
a. [announcements-physics-majors] This list is used for general communications of interest to physics students, including course announcements, information sessions, job postings, scholarship information, physics-related social events, etc. It is highly recommended that you subscribe to this mailing list. Subscribers can receive announcements in a digest format if desired and may also access an archive of past announcements. You do not need to be a major to subscribe. To subscribe to this list, you must sign up HERE: http://mailman11.u.washington.edu/mailman/listinfo/announcements-physics-majors

b. [phys-ugrads] All currently declared physics majors are automatically subscribed to this mailing list, which is used only for essential announcements that all majors should be aware of.

c. [phys-ugadvise] This list is updated each quarter to include all declared physics majors and minors, plus all other students currently taking physics classes at the 200-, 300- or 400-level. This list is used primarily for Physics Student Services Newsletters, which are issued 8-10 times/year.

d. Anyone may subscribe to the mailing list for the UW Society of Physics Students by sending an email request to uwspsofficers@gmail.com.

e. Anyone may subscribe to the mailing list for the Undergraduate Women in Physics @ UW by sending an email request to uwip.uw@gmail.com.


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4. What are the requirements to become a physics major?

Answer: Physics is a "minimum requirement" major. There is no cap on the number of majors, nor is admission competitive. Students may be admitted either (1) through transcript-based admission or (2) through petition. Transcript-based admission requires students to be currently enrolled in a UW-Seattle core physics class (or have just completed one) and to have completed (at UW-Seattle or elsewhere) at least one core physics class and one additional core physics or math class with a grade of 2.6 or higher in the past two quarters (three, if you took a quarter off). Students who do not meet these minimum requirements, but who believe they can successfully complete a physics major, may petition for admission to the major. More details on the application and petition process may be found here.

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5. I meet the minimum transcript-based requirements. How do I declare a physics major?

Answer: As described at the Transcript-Based Admissions page, choose a degree option, fill out the Catalyst Form, enter a viable graduation plan into MyPlan, and then make an appointment to meet with the Undergraduate Academic Counselor to discuss your graduation plan and declare physics as your major. Students may not declare a physics major in the first two weeks of any quarter unless they have a hold on their registration due to lack of a major.

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6. I do not meet the minimum transcript-based requirements. How can I petition to become a physics major?

Answer: Students wishing to petition to declare a physics major must complete a Personal Statement addressing (a) Goals and objectives, (b) Past academic performance, (c) Successes not on the transcript, and (d) Support network (see here for more information). It is recommended that you meet with the Undergraduate Faculty Advisor (UFA) before crafting your statement. After completing your Personal Statement and entering your Graduation Plan into MyPlan, you must make an appointment with the UFA for your petition interview. To be guaranteed an admission decision before the end of a given quarter, students must begin the petition process by the end of the fifth week of that quarter.

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7. I am a major in another department, but I wish to add physics as a second (or third) major. How do I do this?
Answer: If you meet the transcript-based admission criteria (see above), fill out the Catalyst form linked from the Application page, complete a graduation plan and enter it into MyPlan. Then, come to see our Academic Counselor to discuss your graduation plan and declare physics as your major. You will need signatures from advisors in both Physics and your other major department(s) on your Change-of-Major form -- you can get these in any order. If you do not meet the minimum criteria for transcript-based admissions, you should make an appointment with the UFA to discuss your plans and goals before starting the petition process. It is strongly recommended that you declare your major during weeks 3 through 7 of the quarter.

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8. What is required for department honors in the physics major?

Answer: To register for honors, you must be earning very good grades in all your physics courses. You will find the eligibility rules and the equation for determining your minimum physics GPA on the physics department website. Besides maintaining a high physics GPA through to graduation, honors students must complete at least 3 credits of research AND take the senior honors seminar (485-6-7) in three different quarters. Registration in PHYS 485-6-7 is limited to honors students only; non-honors students are required to take 3 total credits from any combination of PHYS 494-5-6 and research. For more information: see Senior Honors Program page.

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9. When and where do I go to sign up for department honors?

Answer: You must enter the physics department honors program a minimum of three academic-year quarters before you graduate so that you can take PHYS 485-486-487 (which is by entry code only for honors students). You may obtain the departmental honors petition from from an Academic Counselor. Once it is filled out, it must be approved and signed by the Undergraduate Faculty Advisor. You will need to see the Academic Counselor each quarter to obtain an add code for PHYS 485-6-7.

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10. What are the requirements for a physics degree?

Answer: Physics majors must meet all the General Education Requirements of the University and the College of Arts and Sciences. These may be found on the Undergraduate Academic Affairs website on General Education Requirements. Briefly, in Arts and Sciences, you must take at least 20 credits each in the areas of VLPA (Visual, Literary & Performing Arts), I&S (Individuals & Societies), and NW (Natural World); you also need to fulfill the foreign language requirement and take courses that expose you to Diversity and Writing -- these courses may be used to meet other requirements. The specific requirements for a bachelor of science in physics depend on which degree option you choose: Applied Physics, Comprehensive Physics, Biological Physics or Teaching Physics. There are core requirements common to each degree track, and then option-specific requirements, as detailed on the Major Requirements page. You can also log into MyUW and run a Degree Audit for your selected major to see the specific requirements and how many you have already met. Any course used for a specific physics degree requirement must have a grade of 2.0 or above, and may not be S/NS. A particular course may only be used for a single physics requirement.

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11. How much math do I need to take so that I can do well in my physics courses?

Answer: A solid foundation in math skills is essential for success in physics. In our majors program, you must take the MATH 12X (or 13X) series. You are also required to take a minimum of two additional math courses (except in the biophysics track which only requires one additional math course, although more are recommended) taken from our "math menu". The idea is that you will choose math courses that will help you master any weak areas in your math skills – the highlights of the 300-level math are covered in PHYS 227 (required for all majors) and PHYS 228 (may be replaced by an additional upper division math class for the applied track). Elements of MATH 307, 308, 309 and 324 (or the equivalent AMATH classes) are used in upper division physics classes. Over two-
thirds of physics majors take more than the minimum math requirements for their degree option.

Resources for Help and Advice

1. What are the roles of the different people in Physics Student Services?

**Answer:** The UW Physics Student Services group includes our Undergraduate Advisor -- Academic Counselor Margot Nims, our Graduate Advisor -- Academic Counselor Catherine Provost (who is also happy to meet with undergraduate students, especially those with an interest in graduate school), the Undergraduate Faculty Advisor -- Professor Marjorie Olmstead, the Student Services Program Assistant -- Paula Newcomer, and the Introductory Course Program Coordinator -- Susan Miller. You may make an appointment here.

If you aren't sure whom to see, start with the Student Services Program Assistant in the foyer of C139, who can direct you to and/or help you make an appointment with the right person. The Introductory Course Program Coordinator can help you with issues related to Physics 114-5-6, 117-8-9 and 121-2-3 at UW, including add codes and switching sections. The Academic Counselors can help with all aspects of your experience at UW, and have likely seen your problem before during their many years of service to the university and the department. They deal with issues large and small - from upper-division add codes to connecting you with counseling resources. You must see the Undergraduate Advisor to declare the physics major or apply to graduate.

The Undergraduate Faculty Advisor can help with issues that require a background in physics; she is also the person who oversees any potential substitutions for physics degree requirements, including approval of out-of-department courses or research experience, assignment of physics course equivalence for transfer credits, permission to take a course either without a pre-req or for a third time, and approval of petitions to declare a physics major.

In addition, the Graduate Faculty Advisor, Professor Andreas Karch, and the Graduate Program Coordinator, Professor Marcel DenNijs, interact mainly with students in the physics doctoral program, and the Professional Masters Faculty Advisor, Professor Emeritus Jeffrey Wilkes, interacts mainly with students in the evening masters program. All three are happy to meet with undergraduates with questions about our graduate programs.

2. Whom do I see if I have a specific issue with one of my general education (GE) requirements?

**Answer:** Physics Student Services primarily only handles issues related to physics degree requirements, although our Academic Counselor is quite familiar with many of these requirements and can be helpful in some cases. In particular, waiver of one credit of general education requirements can be handled at the physics department level. For the GE-requirements, you should see one of the Advisors in the Office of Undergraduate Academic Affairs found in Mary Gates Hall (see the following link:

[http://www.washington.edu/students/gencat/front/uaa.html](http://www.washington.edu/students/gencat/front/uaa.html).

3. How often should I see a physics Advisor or counselor after I have declared physics as a major (up to when I graduate)?

**Answer:** All majors should meet with a faculty advisor during the Annual Spring Advising period in April/May. In addition, if you are struggling with a physics course (especially if it is required), you should seek advice well before the 7th week of the quarter. If you find that you need to make a serious change in your class schedule, you should seek advice as to what consequences may ensue due to the needed changes. You may also stop by to discuss finding a research opportunity, plans for graduation and beyond, study abroad
opportunities, potential course substitutions, filing a contract for getting PHYS 499 credit for research, approval of out-of-department research for the physics degree requirements, or any other elements of your studies that we can help with.

In addition to your formal academic advising, sometime early in your undergraduate career at the UW you should cultivate an advising/mentor relationship with one or more faculty whom you may meet through classes, by doing independent research, or simply by knocking on the office door of someone you would like to meet. Many of your future career options will require letters of recommendation from faculty - it is your responsibility to make sure they know you well enough to write a useful letter. You can also get advice and ideas during the office hours associated with any of your physics courses, or by talking with any of the associated TAs.

4. Personal issues unrelated to my specific physics classes are interfering with my ability to do well in my classes. Where can I find help?

**Answer:** The Academic Counselors and Undergraduate Faculty Advisor are happy to talk with you about coping strategies and options and to connect you with campus resources that can help. Health and Wellness, the Counseling Center, and Hall Health are great resources, largely covered by your Student Activities Fees; they offer multiple services ranging from Support Groups to Drop-in Counseling to full medical care. The Office of Student Financial Aid has resources for emergency loans and food assistance.

5. I have difficulty performing and conveying the extent of my knowledge under standard testing conditions, and believe I might qualify for accommodation with extra time and/or a quiet space for exams. How do I obtain such accommodations?

**Answer:** Talk to Disability Resources for Students to learn about and access disability resources. These can include both temporary (e.g., broken arm) and long-term (e.g., ADD or dyslexia) conditions that entitle you to accommodation to facilitate your education. Typically, about 3-5% of students in a large physics class qualify for extra time and/or a quiet space on exams, and there is no observed correlation with inherent ability to do physics. No one but your professor is told of your accommodation, and the reason for your accommodation is also not told to the professor unless you wish it.

6. I am worried about a recent change in the behavior of a fellow student (e.g., anger management issues, depression, avoidance of situations). How can I confidentially report this to someone who might be able to help?

**Answer:** If you suspect there is immediate threat of danger, call 911. Otherwise, call Safe Campus at 206-685-SAFE (206-685-7233). You an email them at safecamp@uw.edu, but you will reach someone faster by phone. They will help you assess the situation, get you or the other student help if you need it, and take the lead on following up when appropriate.

7. I have witnessed inappropriate behavior by a fellow student, instructor or staff member toward another person (or myself). What should I do?

**Answer:** All members of the UW community deserve to be treated with respect. If you feel safe and comfortable calling out disrespectful or otherwise inappropriate behavior to its perpetrator, please do so. Even if you don't (or were too flabbergasted to do so at the time), please report such behavior to the Academic Counselors. They are your first point of contact in the physics department, and they can help you assess the behavior and, if appropriate, report it (without names attached, if you wish). If you are the victim of sexual harassment, assault or relationship violence, contact the Health and Wellness Advocate for confidential advocacy and support, as well as information about your rights and options for reporting.
8. How can I get a tutor?

Answer: See the Tutor List on this website. NOTE: The department is not responsible for the qualifications of these individuals, nor is the list necessarily up to date. Free resources include the Physics Study Center (in the basement of the A-wing, underneath A118), which is staffed by physics teaching assistants during class hours, and faculty in the intro classes often hold office hours there, and CLUE in Mary Gates Hall, which regularly holds review sessions for the 100- and 200-level physics classes and has drop-in tutoring for physics on week-day evenings. Faculty and teaching assistants also hold office hours for their courses.

9. Is there a departmental Lost and Found? Where is it?

Answer: The Lost and Found is at the reception desk in the Main Office. Items left in the lecture halls are typically left on a table near the front of the room for a while before getting transferred to the main office. Valuables left in a lecture hall are typically kept secure by the Lecture Demo staff until the end of the day, after which they are brought to the Main Office.

Grades, GPA, and Credits

1. There are degree programs at the UW which require me to maintain a certain gpa. Does the physics department have such a requirement?

Answer: Yes, each student in the physics major is expected to maintain a gpa greater than or equal to a 2.0 on average for all courses taken in the physics department (which is also the same requirement for all courses taken in the College of Arts and Science). Also, every course that is used to satisfy a major requirement, whether in physics, math or a cognate subject, must be passed with a 2.0 grade or higher grade, and may not be graded S/NS.

2. I am struggling with a particular physics course. How do I avoid a major hit to my physics gpa? Answer: If it is before the end of the seventh week of the quarter and you believe that you will get less than a 2.0 grade for the course, then convert its grading to S/NS (from your "MyUW"). This type of grade will not affect your gpa, although it does appear on your transcript. If you get an "NS" grade, this will count as a failed attempt for a class. If you get an "S" grade, you can petition the registrar to convert it back to the numerical grade assigned by the professor to apply the course to a degree requirement, but the registrar rarely approves this more than once for a given student.

3. I failed on my first attempt to earn the minimum (2.0) grade for a physics course to be used towards a degree requirement or as a prerequisite. How do I go about repeating the course?

Answer: With the approval of the physics department offering the course, an undergraduate may repeat a course once. For the first repeat, that permission is almost always granted. Your first option is to simply try registering yourself into the make-up course (probably during Period II); if you find it blocked for some reason, our Academic Counselor can help you to get registered.

4. I failed on both my first and second attempt to earn the minimum (2.0) grade for a physics course to be used towards a degree requirement or as a prerequisite. How do I go about repeating the course for a third time?

Answer: You MUST meet with the UFA (schedule meeting here), who will review your academic record and determine whether or not you should be allowed to take the course a third time. You will need a valid justification for why you need the class, how you expect to...
be successful, and what you will do that is different from your previous attempts. It is not possible to take a UW physics course for a fourth time. In some cases, the UFA will request that you reduce your course load or your outside work-load (for the current quarter) or take a preparatory class first in order to give you a better chance of passing the course on the third attempt.

5. If I retake a course, how does this repeat impact my GPA?

Answer: If you take a course twice, the physics department follows the University policy, which is to count both the original grade and the grade in the first repeat in your GPA calculation. If a second repeat is pursued, it will not be used to calculate your overall UW GPA, but it will be used for your physics GPA as well as for satisfying the course requirement in question.

6. How do I exceed the 180-credit / 12 quarter limit which has put a hold on my registration?

Answer: You should meet with the Undergraduate Advisor to develop a graduation plan that will accompany your petition to the College of Arts and Sciences for permission to graduate with additional credits and/or quarters. Well-justified petitions are generally successful; about half of physics majors graduate with more than 210 credits.

7. I have AP-credits which allow me to skip the PHYS 12X series. Is it a wise decision to do so?

Answer: The Physics AP exam curriculum changed recently, and we do not have sufficient data to know whether it does a better job at covering the introductory physics series than the old curriculum. In the past, we found that most students who chose to skip the introductory series struggled when taking the 200-level courses, but there were exceptional students for whom it was the right decision. We generally recommend that students with AP physics take the physics honors series, H-PHYS 12X, which is offered only once a year, starting with PHYS 121 in the Autumn quarter. It is a bit more challenging and adds some topics not found in the regular sequence. You should talk with the instructor of the honors class before skipping one or more quarters of the sequence. Note that if you skip the 100-level series without having received official credit for PHYS 12x, you will need to take an additional year of upper division physics, plus an additional laboratory (or the 117-8-9 labs) to replace PHYS 12x in your degree requirements.

8. I note that PHYS 294 or a research course such as PHYS 499 is only offered with CR/NC grading. How does this satisfy a graduation requirement if it is not numerically graded?

Answer: If a course is only offered with the CR/NC grading option, it can be accepted in place of a numerically graded course.

9. How do CR/NC graded courses differ from those that are graded S/NS?

Answer: S/NS graded courses can only be applied to true electives (i.e. to fulfill the 180-credit requirement), but not to courses taken to fulfill a specific requirement. An instructor does not know if you are taking the class as S/NS, but assigns you a decimal grade that is converted at the registrar's office into S/NS with a cutoff of 2.0. On the other hand, CR/NC courses (which are offered only on this basis) can be used to satisfy a specific requirement. The CR/NC boundary is set by the individual instructor for the entire class, and may be higher than the equivalent of a 2.0. Neither CR/NC nor S/NS courses count in calculation of your GPA.
1. I would like/need to take a certain course now, but I do not have one of the prerequisites. Can I get the prerequisites waived?

**Answer:** Generally, you should not do this because you will not be adequately prepared to learn the new material. However, if you believe otherwise, then you need to talk to the professor who will be teaching the course in question and convince him/her that you can handle the curriculum. The professor should then email our Academic Counselor so that she can register you into the course.

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2. Is it possible to waive a required physics course? If so, how is it done?

**Answer:** It is the general policy in this department to not waive required physics courses. However, it may be possible to replace the course by a physics class that covers similar content, but at a higher level, or a class for which the course in question is a prerequisite. Honors math students may apply to substitute upper division math classes for PHYS 227 or 228 combined with taking an extra physics elective. Approval must be obtained from the UFA (pre-approval is highly recommended before you skip a class).

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3. I would like a UW-course taken outside of the physics department to be used as a substitute for a required course in my degree program. Is this possible, and if so, how do I get it approved?

**Answer:** You must submit your request to the UFA. Please include a description of the outside-course and, when possible, a week-by-week lecture schedule. Since the course in question will not be taught as it would be by someone in the physics department, the primary emphasis of the course may make the substitution inappropriate; thus, you must carefully explain the extraordinary circumstances which have motivated your request. The UFA may require that if you replace a physics class with one from outside the department then your upper-division electives (which normally can be from outside physics) must include a physics class.

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4. Can I take a physics graduate class? Can it fulfill a physics degree requirement?

**Answer:** Undergraduates wishing to take a graduate physics class must obtain permission from both the course instructor and the UFA. The professor in a graduate class will be assuming a certain level of proficiency in all facets of the undergraduate program, and he/she will not slow down the course for your benefit. If you obtain permission, you should then see the Graduate Advisor to register for the class. If you wish for the graduate class to meet a physics degree requirement, either as a substitute for the undergraduate class on the same material, or as an elective, you must submit your request to the UFA. Special topics classes accessible to undergraduates are typically co-listed as a 400- and 500-level class; in that case, you should register for the 400-level class.

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5. There is a course I would like to use as a cognate subjects elective, but it is not on the list of allowed courses in DARS. Is this possible, and if so, how do I get is approved?

**Answer:** If you find a course you believe should be appropriate as a physics cognate-subject elective, you must submit your request to the UFA. Please include a description of the outside course and, when possible, a week-by-week lecture schedule. To qualify, the course should be at the 300- or 400-level, and use physics as a prerequisite. In general, it should be a course you could imagine being taught in a physics or applied physics department.

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6. Is it possible to get credit for a physics class by examination if I have learned material on my own?

**Answer:** The physics department does not award “credit-by-examination.” However, if you have mastered material on your own so that it would not be appropriate for you to take a class, you may follow the procedure above for taking the next course without the
official prerequisite, and petition the UFA to substitute a higher-level course on the same material. A given course may not, however, meet more than one physics requirement. For example, if a student obtains permission to skip PHYS 121, then PHYS 329 plus PHYS 117 (intro laboratory) could substitute for the PHYS 121 requirement, but the student could not then use PHYS 329 to meet the upper-division elective or 32x requirements.

Physics Degree Options

1. How do I find out about the different degree options and their requirements?
   **Answer:** The Physics Undergraduate web page provides links to Information on the different degree options and their requirements. In addition, you can see what requirements are needed specifically for you by requesting a new DARS audit using the particular track that appeals most to you. Sample paths to graduation are also available here.

2. How do I decide which option is the right one for me?
   **Answer:** You should consider your career goals and interests, and discuss them with your peers, faculty and the department advisors. The Comprehensive option is aimed at students who are heading for graduate study in physics or a closely related field (e.g. astronomy, geophysics, materials science, etc.), and includes both breadth and depth. The Applied option is for students who plan a technical career at the B.S. level, and includes more laboratory and computing requirements and fewer mathematically based physics classes. The Teaching Preparation option is for students planning a career that involves explaining physics to others, either in the classroom or as a journalist or staff scientist in a non-technical environment (e.g. politics), and requires the Physics by Inquiry sequence (407-8-9). The Biological Physics option is aimed at students interested in the interface between physics and biology either as a preparation for medical school or for biomedical research. It adds requirements in chemistry and biology to the core physics curriculum.

3. I am interested in switching between physics options. How do I do this?
   **Answer:** Talk to our Academic Counselor and she can help you with the paperwork, i.e. filling out a Change-of-Major form and submitting it to Schmitz Hall.

4. Can I get my degree with more than one physics option on my transcript?
   **Answer:** No. You must choose a single option, although you may change it at any time before graduation.

Undergraduate Research

1. How do I find out what research is available within this department?
   **Answer:** Go to the Research section of this website. If you find a field that seems interesting to you, go to the location of the research, and ask someone working there for a brief tour. If you are still interested, go to the professor in charge of the research and ask if you can do PHYS 499 with him/her for a few credits in the next quarter. Just remember, you are expected to put in about 3-hours/credit/week while directly involved in independent research (which means in a laboratory in most cases).
Another useful tool is to search for articles written by UW faculty on a subject you are interested in. From the UW Library home page, click on “Articles and Research Databases” and then “Web of Science” (at the right). Under “topic” enter the area you are interested in (e.g., nanophotonics, molecular motors, neutrino mass, etc.), then “add another field” for “Address” and enter “Seattle” or “98195”. You will then see a list of papers by people in Seattle or at UW that contain your requested topic as a key word. Browse the papers to find a research group of interest, and then knock on doors. You can include “Physics” in the address field as well to narrow your search to people in our department.

2. How do I find out what research is available outside of this department?
Answer: The approach in this case is similar to that above, except that you start with the website of the department outside of physics, and/or don’t include “Physics” in the search parameters for the Web of Science.

3. Can I have research credits outside the physics department count for my capstone physics degree requirement?
Answer: To have research performed outside the department satisfy your UG-physics research requirement, it must have a strong physics component. It is highly recommended you get your project pre-approved by the UFA. For the credits to be assigned to the research/seminar requirement, you must submit to the UFA a short paper (4-6 pages) describing the project, your contribution to it, and the physics involved. Your research supervisor must send an email to the UFA or attach a note to the paper stating that it is an accurate description of the work you performed. The UFA will read your paper and determine how many credits of the capstone requirement your effort should satisfy. Students in the biophysics track can use research credits for biophysics research outside the department from the list of approved departments (see your DARS) without writing the paper.

4. I got paid to do research, either on- or off-campus, or did an extracurricular activity in which I did the equivalent of physics research without receiving UW credit. Can I use this for my capstone physics degree requirement?
Answer: If your research experience meets the spirit of the capstone degree requirement (i.e., at least 100 hours spent independently applying physics you learned in the classroom to a novel situation outside the classroom), but you did not receive UW credits for it, then you can petition the UFA for this to partially satisfy the capstone requirement. You must submit to the UFA a short paper (4-6 pages) describing the project, your contribution to it, and the physics involved. Your research supervisor must send an email to the UFA or attach a note to the paper stating that it is an accurate description of the work you performed. In addition, you must take an extra three credits of a physics or cognate subject elective that can be used to satisfy this requirement on your DARS.

5. I want to do a Research Experience for Undergraduates (REU) this coming Summer. Where can I learn more about potential opportunities?
Answer: The National Science Foundation (https://www.nsf.gov/crssprgm/reu/reu_search.jsp), Department of Energy (https://science.energy.gov/wdts/suli/), NASA (National & Local), and Department of Commerce (NIST) (https://www.nist.gov/surf) all sponsor summer internships that UW students have participated in, and there are other programs, as well. Deadlines are typically in January, and programs are highly competitive so you should set aside time to write an excellent application and talk to the faculty who will write your letters of recommendation.

6. Why do I want to participate in a REU program?
Answer: Physics is a real and vibrant activity beyond the classroom, and a summer research experience will allow you to enjoy being at the research frontier while getting paid for it. Also, graduate school admissions committees will expect you to have participated in research. Letters of recommendation from research supervisors, whether at UW or elsewhere, can speak more directly to your ability
to succeed in a graduate program than those from your classroom instructors, and statements of purpose that speak intelligently about the relationship between your goals and your research experience will get you noticed. Finally, spending time at an institution other than UW will not only give you an additional letter of recommendation, it will broaden your prospective on potential graduate schools and fields of inquiry. Even if you are not currently considering graduate school, an REU is great experience for a future technical job, as well.

7. I want to do an internship this coming Summer. Where can I learn more about this?
Answer: Industries tend to think they are looking for engineers as interns, but are often even happier with applied physicists due to their flexible approach to problem solving. The annual Engineering Career Fair (autumn quarter) is a good place to start, as is the Career Center @ Engineering. The Academic Counselor is also a great resource, as she frequently knows where previous students have obtained internships. You can help this process by making sure she knows where you are spending the summer.

8. How can I receive UW credit for an off-site internship or experience?
Answer: General Studies 350 is a mechanism for earning credit for off-campus learning experiences. There are different sections depending on whether the experience is in the public or private sector, and whether it has in-person or distance-learning contact with your academic sponsor. You can also enroll in a Summer Internship with Autumn Enrollment. See here for more information. Foreign citizens who need their experience to meet a degree requirement in order to be paid for an off-site internship should contact the UFA for pre-approval.

9. What are the relative benefits of fulfilling the capstone degree requirement with research or seminar?
Answer: Both research and seminar are useful educational experiences, and students in departmental honors are required to take part in both. Research is a unique experience where you apply physics outside the classroom to a question for which the answer is unknown. It is recommended that you take three credits of research in one quarter, so you can have a sufficiently immersive experience to move the research forward after you have been trained. Many faculty will prefer that you commit to more than one quarter so that you can have more time to apply your training. The seminar must be taken three times (1 credit each time), and you will be exposed to a wide variety of topics as well as have the opportunity to prepare and present material on a library research project to your peers. If you have not yet found a research opportunity three quarters before you plan to graduate, you should take the senior seminar to start on the capstone requirement. Don't assume you will be able to find a 3-credit research experience your very last quarter at UW without setting it up well in advance.

Specific Courses

1. Is PHYS 226 (Relativity, Particles and Symmetries) required or not?
Answer: PHYS 226 is required for students in the Comprehensive and Teaching Preparation options, but is optional for the Biophysics and Applied options, where students may choose from a menu that includes both PHYS 226 and some 300-level electives. Biophysics and Applied Physics track students who declared their major prior to 2015 will have PHYS 226 listed as a requirement on their DARS; see the Undergraduate Advisor or the UFA to allow one of the 300-level electives to substitute for PHYS 226.

2. I am working on a physics minor, but it appears that I can not take PHYS 225, since it has PHYS 227 as a prerequisite. What can I do?
Answer: The Physics 225 math prerequisites were recently updated to any of: both Math 307 and Math 308, both AMath 351 and 352,
Phys 227 (which has a co-requisite of any 300-level math class), or Math 136. Alternatively, B PHYS 225 at UW Bothell has a prereq of Math 307, and PHYS 225 at Bellevue College requires only Math 324; both may be used for this requirement. Finally, if you have taken a course in another department that covers introductory quantum mechanics (e.g., physical chemistry), then you can petition the UFA to substitute another physics class for PHYS 225.

3. Whom do I see if I have a question about the topics offered in a specific course that I wish to take, or am taking?

Answer: Sample syllabi for most undergraduate physics courses are available here. Check first to see if the information you are seeking is on the website for the course. If not, or to gain access to the website if it is restricted to current students, meet with the professor who will be or is teaching the course. For the introductory courses, the department has a standard list of topics covered each quarter. In the cases of the higher division courses, the general rule is that the professor will cover at least 80% of the topics that are normally expected to be covered in such courses (and most do more than 80%).

4. I took the PHYS 11X-series instead of the PHYS 12X series. Can I substitute any of the courses I took in the 11X series for the 12X series?

Answer: The curriculum for PHYS 121 is very similar to that covered in PHYS 114, and only a little calculus is used in PHYS 121. Thus, we will accept your PHYS 114 course as a substitute for Physics 121, assuming that you have taken the PHYS 117 lab as well. If you have not taken a lab with your equivalent PHYS 114 lecture course (which often happens with transfer courses), then you must take (and pass) PHYS 117 before you can satisfy the core PHYS 121 requirement. For the remaining courses in the PHYS 12X series, calculus is used much more often and there are significant differences in content or difficulty of the curriculum relative to PHYS 115 and 116. Thus substitutions with 11X courses are not allowed for PHYS 122 or 123.

Transferring Courses to the UW

1. I want to take a Summer physics course at another college or university. How do I find out if it will transfer as equivalent to the physics course that my major requires?

Answer: To receive transfer equivalency, you must submit your request to the UFA following the instructions given here. For pre-approval, you would send an email to ufaphys@uw.edu which provides the following information: 1. The name of the College/University (indicating semester/quarter system). 2. The name of the physics course (with the respective number of credits). 3. A brief catalog description of the course (specifying calculus based or algebra based). 4. A complete syllabus of the course, along with a week-by-week lecture schedule (with topics and/or textbook chapters) if possible. Often, most of this information can be obtained from a course Web-address (assuming that you provide it in your email).

2. I have transferred credits to the UW from another college or university. How do I get my physics courses evaluated so that they can satisfy requirements for my major?

Answer: In addition to the items listed immediately above for pre-approval, you must also provide the UFA with a copy of your (unofficial) course transcript from the institution in question. If your transfer credits are not yet entered into the Electronic Academic Records System before you need to register for a course for which they are a prerequisite, you will need to obtain permission to register from the UFA and bring this (typically an email) to the 11x/12x Program Coordinator (Phys 11x or 12x) or the Undergraduate Advisor (upper division) to register for that course.

3. I want to take introductory physics online. Is that possible?

Answer: UW does not offer any online introductory physics, but there are some valid courses you can find at other institutions that
will be accepted by the UW Registrar. It is highly recommended that you get pre-approval from the UFA for any online class you wish to receive equivalence for (same information required as for the Summer instructions above). If you take a calculus-based on-line introductory course that covers the same topics as PHYS 12x, you must complete the associated laboratory (PHYS 117, 118, or 119) to receive equivalent credit for PHYS 12x. To register for the laboratories, contact the 11x/12x Program Coordinator after having obtained permission from the UFA.

4. I wish to study abroad. How do I find out what physics courses I can take in order to satisfy the requirements for my degree in this department?
   Answer: The items to provide to the appropriate UFA are the same as for courses taken in Summer school, except make sure the information is in English. It is highly recommended that you meet with the UFA before you go abroad to plan how you will satisfy your degree requirements.

5. I have returned from study abroad and I need to have my courses evaluated. How do I proceed? Answer: The required information (assuming that you did not get the courses pre-approved by one of the department's UFAs) is again the same as that for courses taken in Summer school, except again make sure it is in English. After an agreement between you and the UFA has been made concerning the evaluation, you must bring the course-form (from the IPE office) to the UFA for his/her signature.

Graduation and Beyond

1. What can I do to help my chances of getting a job after I graduate?
   Answer: First and foremost, the BS degree that you earn in this department represents some of the best training that you can get for any career that you ultimately choose for your life's work. Employers will be hiring you because of your analytic skills and ability to solve difficult problems. Take classes that will make you stand out in your chosen field (e.g., programming, laboratory skills) and get practical experience through research, extra-curricular activities and/or internships.

   You should attend the department's annual Career Panel in winter quarter (slides on the UG website) for ideas and advice. In addition, the University maintains a Center for Career Services, which sponsors such things as Career Fairs and Workshops for any interested students, and the College of Engineering and its Career Fairs (starting in October) are also a useful resource. When the Undergraduate Advisor receives information about job opportunities, she forwards it to the [announcements-physics-majors] listserve. The national resources (statistics, companies that hire physics bachelors, etc.) listed above are quite useful as you consider what your career options might be.

2. When should I apply to graduate?
   Answer: The physics department strongly requests that you apply for graduation no later than two full quarters before the date upon which you wish to graduate (since this will grant you "Graduating Senior Priority" for registration purposes during your last two quarters at the UW). However, to even out the additional work load impressed on the Academic Counselor when you come to her to apply for graduation, the physics department strongly encourages you to apply early in that third quarter before you graduate. Application is a two-step process, since you must fill out the department's "Senior Survey" after obtaining the access code from the Academic Counselor before you can file your paperwork.

3. I am going to apply for graduate school which starts next Autumn. When should I take the GRE?
   Answer: The Physics Subject GRE is only offered three times each year - April, September and October. You should take the Physics GRE no later than the Autumn of your last academic year as an undergraduate. However, many students choose to take it twice, once
in the April before your final year, and then again in the Autumn. You should study for the GRE by doing several practice tests and working to fill in any holes you uncover in your ability to solve GRE-type problems quickly and accurately. There is more flexibility in the timing of the general GRE, and many students choose to take it over the summer. It is important that you study for the GRE to do well.

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4. What will I need for my application to graduate school?

**Answer:** The top graduate schools will look for a high GPA (> 3.5 or more), more math and more physics than required for the minimum major, high GRE scores (> 800), productive research experience, and three strong letters from professors or employers who can say specific positive things about your ability to thrive in graduate school. You will also need to compose a coherent statement of your skills, interests, experience and goals. If you are missing (or are weak in) one or more of these factors, the others (especially the letters) need to be very strong to get into top schools. Note, however, that there are over 150 PhD-granting physics departments, many with pockets of excellence in a particular sub-field of physics. Broadening your search beyond the top 20 departments can greatly increase your chances of admission.

5. When should I apply for graduate school?

**Answer:** If you are planning on starting graduate school next Autumn, you should have all of your application materials received by the physics department of interest by each school's deadline, which is typically around December 15, although some are not due until January. Additional useful information can be found on the [Graduate section of this website](#).

Traditionally, the department's UFA has provided a discussion on applying to graduate school in the middle of the Autumn quarter of each academic year. This meeting is referred to as our annual "Juniors and Seniors Meeting". The slides from this presentation may be accessed [here](#).

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6. Where can I get information about graduate schools?

**Answer:** Start your search with [gradschoolshopper.com](http://www.gradschoolshopper.com). Narrow it down by talking with faculty, graduate students and post-docs in the department, as well as any contacts at your off-campus REU site.

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7. I'm interested in teaching high school physics. Is my physics degree all I need?

**Answer:** To teach in the public schools, you will also need course work in the school of education to become fully certified. Some private schools are willing to hire physics bachelors directly, and you can also participate in Teach for America, VISTA or the Peace Corp with your Physics B.S. to get experience communicating physics to students. Meet with faculty in the Physics Education Group to discuss your interests and plans, and take at least one quarter of the PHYS 407-8-9 sequence. Also, there are very few high schools that offer 5 periods of physics, so increasing your teaching portfolio to include other subjects such as math, chemistry, earth science, and/or computer science will make you more marketable.

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