

Engineering Physics Additional Program Notes, Approved Technical Elective List, and Specialization Suggestions

Current as of Wed 2024 06 26 09:35:21

2024-25 Calendar:

https://academiccalendars.romcmaster.ca/preview_entity.php?catoid=56&ent_oid=7390&returnto=11324

2023-24 Calendar:

https://academiccalendars.romcmaster.ca/preview_entity.php?catoid=53&ent_oid=7120&returnto=10754

2022-23 Calendar: <https://academiccalendars.romcmaster.ca/content.php?catoid=47&navoid=9409>

2021-22 Calendar:

https://academiccalendars.romcmaster.ca/preview_entity.php?catoid=44&ent_oid=5971&returnto=9024

Typically, you should use the calendar of the year you entered the program (i.e., when you started level 2). Some exceptions happen when this isn't possible (e.g., the course listed no longer exists) - in those cases, go with your advisement report, and talk to Dr. Minnick and/or your academic advisor if you have any questions.

1. Tech Elective FAQ

1. What's a technical elective?
 - a. An engineering or science course from the approved list above
 - b. You need to take a certain number of units from tech electives meeting certain requirements (see below), but besides that you get to choose which actual courses you take (unlike compulsory courses like this one where you don't have a choice besides choosing a different program).
2. Do I need to complete one of the *streams* (e.g., nuclear engineering, nanoscale engineering, etc.)?
 - a. No - you only need to meet the min required tech electives (see next point)
3. What are the min required tech electives?
 - a. At least one ENGPHYS tech elective has a lab (e.g., 3D04, 3E04, 3O04, 3PN4, or 4Z04)
 - b. At least 16 units of your tech electives are from EP electives (or 12 if you're in BME), including your tech elective with a lab
 - c. If you're in EP&BME, at least 6 units of tech electives are from the list of approved IBEHS tech electives, including any courses used for the previous requirements
 - i. the list of IBEHS tech electives includes courses from all engineering departments; you can find it on this page:

https://www.eng.mcmaster.ca/ibiomed/courses/?filter-search=&filter-course-category=technical-elective&filter-degree-option=#course-listing__filter

- d. You have at least 32 units total (or 28 if you're in BME), including any courses used for the previous requirements
 - e. **Note: IF you're *not* in EP&BME AND you started level 1 prior to 2021 (so didn't take ENG1P13, 2PX, & 3PX), then you must also have at least 3 units of your tech electives be from courses offered by engineering departments *other than* Engineering Physics.**
 - f. **Note: If you started ENGPYS prior to fall 2022, then your required total number of technical electives will be different. You should add the total tech electives listed to the required 4U*2 lab courses to determine your total required electives. Talk to Dr. Minnick, your academic advisor, and/or consult your advisement report if you have any questions about how many are required.**
4. Do I need to complete electives in any particular year? e.g., 12-14 in level 3 AND 26-28 in level 4?
 - a. No - you just need 32 units total (these numbers add to 38 because they also include 6 units of complementary studies electives)
 5. Why does the calendar say 38 units of electives but this document says 32?
 - a. Because the calendar for the pure Eng Phys program (not the 5-year programs) is lumping complementary studies electives and technical electives into the same category it just calls "electives"; you need exactly 6 units of complementary studies electives (plus the 6 you needed in level 1 for a total of 12 units of complementary studies electives) leaving 32 units required from tech electives
 6. What's a complementary studies elective?
 - a. Humanities or social science courses (for the most part) from this list:
<https://www.eng.mcmaster.ca/engineering-complementary-studies-elective-courses/>
 7. What are the allowed technical electives?
 - a. Courses from science or engineering as long as:
 - i. They're sufficiently *technical*; i.e., require a certain minimum level of math, physics, etc. as background to take it, and are not focused on things that qualify as complementary studies (typically humanities & social science content), and
 - ii. They're not redundant with content in ENGPYS core courses
 - b. List to most up-to-date spreadsheet:
<https://www.dropbox.com/scl/fi/j3r5h03o7rzsug9cfnwhu/TechElecCourseDetails-Streams.xlsx?rlkey=a6deyftikhrebmeqgl1demq7&dl=1>
 - c. Courses not on the list could still be added; email Dr. Minnick to inquire if something could be.
 - i. Note that ASTRON 1F03 can't work because it's too low level considering your EP core courses, and ASTRON 2B03 can't work because it is non-technical.
 8. Does being on the tech elective list mean I'm guaranteed a spot in the course?
 - a. No – being on the list only indicates that if you somehow *do* take the course, it will count towards the tech elective units you need.
 9. What do I need to be able to take a course?
 - a. To meet the prerequisites listed for it in the calendar (or possibly have them waived by the instructor, see below)
 - b. To not have scheduling conflicts with other courses you're enrolled in (or have the conflicts waived by the instructors of both courses and EP department UG chair, see below)

- c. To not have its units exceed the maximum number of units per term (6 for each spring/summer term, or 20 for fall/winter terms), (or receive permission to overload, see below)
 - d. To receive permission from the department offering the course if the course has a department permission requirement (this often isn't indicated in the calendar, and is imposed to prioritize spots for students who need the course as compulsory one)
 - e. To register early enough that there are still spots available in the course (if there are not, you should email the admin of the department offering the course to be put on the wait list – this also lets them know how much outstanding demand there is for the course which can influence them expanding capacity by changing to a larger room or adding a lab or tutorial section)
10. What are the specialization suggestions, and how do they work?
- a. These are listed in the calendar program notes, and repeated below.
 - b. Do I need to take all the courses from a stream to complete the stream?
 - i. No. In fact, there's no official status that you "completed" a specialization stream.

- **Nanotech Device Engineering:** ENGPYHS 3PN4, 4MD3, 4Z04, MATLS 4H03
- **Photonics/Optical Engineering:** ENGPYHS 3E04, 3PD4, 3PN4, 4S04, 4Z04, ELECENG 3FK4 and 4EM4
- **Solar Photovoltaic Engineering:** ENGPYHS 3E04, 3ES3, 3PN4, 4MD3, 4X03, 4Z04, MATLS 4Q03
- **Nuclear Engineering:** ENGPYHS 3D04, 3ES3, 3O04, 4D04, 4NE3, 4P03, 4PP3, MECHENG 4O04, 4S03, 4U03, and 4V03
- **Biomedical Engineering:** ENGPYHS 3E04, 3PN4, 4B03, 4I03, 4S04, 4Z04, ELECENG 4BD4, MECHENG 4N03
- **Quantum Computing:** ENGPYHS 4QC3, 4QM3, and optionally any of MATH 2R03, 3C03, 3D03, 3QC3, PHYSICS 3MM3, 3QI3, 4F03, DATASCI 2G03, 3ML3, COMPENG 2SH4, 2SI3
- **Space Systems Engineering:** ENGPYHS 3O04, 3SP3, 3D04, 3E04, 4X03, MECHENG 4AA3, 4Q03, ELECENG 3TR4, and optionally MATH 3C03, PHYSICS 3A03, 3C03, 3QI3, ASTRON 2E03, 3X03, 3Y03, ELECENG 4TK4, ENGPYHS 4QC3, 4QM3, MATLS 3M03, MECHENG 4J03, MEDPHYS 4F03
- **Interdisciplinary Engineering Physics:** ENGPYHS 3D04, 3E04, 3ES3, 3O04, 3PD4, 3PN4, 4B03, 4I03, 4PP3, 4QC3, 4X03

2. Getting Course Permission

2.1. How to Waive Prerequisites

(note: some departments have special procedures that change this process; e.g., https://www.cas.mcmaster.ca/course_permission/perm_form.php)

1. Get this **form** (3-forms in one; only fill out the first part this time)
2. Check if courses you have are similar to the Prereqs but just haven't been listed (e.g., if it requires SFWRENG 3MX3 then ENGPYHS 3W03 covers a lot of very similar content)
3. Get your transcript ready (profs will sometimes ask for it if they're not sure you have the background knowledge needed.)
4. Write the instructor of the course an email (with the filled out prereq waiver form) that gets across that you'd do well in the course and won't ask for special treatment or attention; explain that you're really interested in the course, and though you don't have the exact course background listed, you do have some relevant experience because of X course(s) and/or X work / research position and/or X project you did. Write also that you take full responsibility for keeping up with the material and seeking external information in the event that your background does turn out to be missing something.
 1. if your transcript looks really good, you can send it along for reference at this step; if it's not so great, you can hold off and only provide it if needed.
5. Forward their approval email with the form (whether or not they also sent it back signed) to the department whose course it (i.e., send to Emma if it's an ENGPYHS course)

2.2. How to Waive Conflicts

1. Get this **form** (3-forms in one; only fill out the first part this time)
2. Get info about the courses: What's OK to miss? What's available asynchronously?
 1. First consult the course outlines and get what you can.
 2. If that didn't answer it, ask a friend who took the course if possible (post on here to solicit answers!)
 3. If you still don't know what you can likely miss, ask the instructor; if that's not listed on the course's department's website you should ask their department's admin
3. Lay out your plan in the form and get both profs (or all profs if it's a 3-way conflict) to sign off on the form
 1. **Tip:** if one course is totally fine with you doing it on your own time for all the conflicting content, you can usually just get *that* prof to sign the form (since the conflict doesn't affect the other prof(s))
4. Send the completed form to the EP Undergrad Chair
 1. Note: unlike the course permission form which goes to the department that offers the course, completed course conflict forms always go to your home department, even if all the conflicting courses are offered in a different department.

2.3. How to Overload

Overloading means taking more than the maximum number of units in a term (21 for fall or winter terms, 12 for spring/summer)

1. Get this **form** (3-forms in one; only fill out the first part this time)
2. Email the EP UG Chair with the 3rd part of the form filled out and the following info:

- 1) the complete set of courses you're trying to take that semester that involves more than 21 units (not just the one course you're trying to add),
 - 2) why you want to take them right now, and
 - 3) what you're going to do to be sure to keep up with the increased workload.
3. Note: Many people want to overload in term 1 of level 3 (or term 1 of level 4 of the 5-year programs) to try to fit in all the electives they need in limited room. This is OK and I will usually approve these requests as long as you understand these other options and still prefer to overload:
- 1) you don't need to take all the suggested courses in a suggested specialization to benefit from them; it's definitely OK and expected to mix and match specializations,
 - 2) you can sometimes take electives later than it seems (e.g., it could be possible to take 3E and 4S03 concurrently in your final year by seeking permission to waive the prereq on 4S), and