

## UW-Whitewater Physics — Laying out your three or four-year plan

**Why do you need to plan?** It is vital that you layout your plan to graduation well in advance. Physics is a very sequential subject; one course builds on the next, so you have to think carefully about the *order* in which you take the courses. If you are thinking about taking a semester to study in a different country (which we highly encourage), it is important to know which semesters you can travel without disrupting your graduation plans.

**What do you need to decide before laying out your plan?** The principal decision you need to make is which track you want to follow. The physics curriculum has four possible tracks:

1. *Engineering* : for those interested in pursuing an engineering career.
2. *Graduate school*: for those interested in being professional scientists or professors.
3. *Industry*: for those interested in working in industrial research and development.
4. *Education*: for those who want to teach physics at the middle school and high school levels.

**How do the course requirements differ for each track?** All majors are required to take a “core” set of courses (29 credits). These are

10 cr	Fall/Spring	Introductory Physics (180/181)
1/1 cr	Fall	Frontiers of Engineering and Physics (190, required twice)
2 cr	Fall	Intermediate Laboratory (221)
3 cr	Fall	Mechanics: Statics (305)
3 cr	Spring	Mechanics: Dynamics (310)
3 cr	Fall	Methods of Theoretical Physics (324)
4 cr	Spring	Modern Physics (344)
2 cr	Fall	Senior Seminar (489)

Each track has additional required courses and optional courses. See the course catalog or the Physics Department website: <http://academics.uww.edu/physics/majreqs.php>. **Many of these courses are not offered every year!** The course rotations schedule is given on the department webpage: <http://academics.uww.edu/physics/Rotation.php>

**What is the role of your advisor?** **You** are responsible for making sure that you have planned out your course schedule properly. The role of your advisor is to answer questions you need to make your decisions, double check your plans, and provide advice about how your planned courses match up with your long-term goals. If you don't come into your advising session prepared with a plan and/or questions, your advisor may ask you to reschedule to give you time to prepare. Since it is quite likely that your plans will change as you progress through the curriculum, you may need to readjust your plan as you go along.

**How do I plan my schedule?** The department has provided an advising spreadsheet, where you can fill in the semesters you plan to take each courses. This spreadsheet will provide a useful start, but may not be exactly what you need. Make sure to double check the results, and make sure that you are satisfying all the courses that are listed in your advising report.

**Are there any general guidelines?**

1. Start off by filling in the Physics courses. Since these are the most constrained, this should be pretty easy to do.
2. Do your math courses as early as possible. During your first two years as a physics major, if you're not taking at least one math class every semester, you're doing it wrong. If you get below a C in your math courses, you will need to retake it. It is vital that you do well in Math 253, 254, and 255. Not only will failing these course stop your progress for up to a year, you need this math for upper level courses.
3. Be aware there **will** be schedule conflicts. If a course is offered every other year, try to schedule it at the earliest opportunity.

4. Check on-line course Catalog course co- and prerequisites. Make sure that you have all necessary courses done for each course in your schedule
5. Avoid the temptation to “get GenEd courses out of the way”. Remember if all you take are GenEd courses in the first few years, then you have semesters filled with only math and physics at the end. That can be very intimidating.

### COURSE ROTATION SCHEDULE FOR PHYSICS AND SELECTED MATH CLASSES

<b>Courses every Fall only</b>	180 (Intro I) 190 (Frontiers of Eng. & Physics) 221 (Intermediate Lab) 305 (Statics) 324 (Methods of Theor) 489 (Senior Seminar)
<b>Courses every Spring only</b>	181 (Intro 2) 310 (Dynamics) 325 (Electricity & Magnetism) 344 (Modern Physics)
<b>Courses only in Fall of Odd Numbered Years</b>	360 (Optics, <b>Spring 2015 only</b> ) 424 (Vibration and Waves) 425 (Quantum Mechanics)
<b>Courses only in Spring of Odd Number Years</b>	330/331* (Analog Electronics) 496 (Special Topics, <b>Spring 2015 only</b> ) Nanotechnology
<b>Courses only in Fall of Even Numbered Years</b>	360 (Optics) 364 (Thermal Physics) 496 (Special Topics)
<b>Courses only in Spring of Even Numbered Years</b>	303/496* (Digital Electronics)
<b>Math Courses offered every Fall only<sup>‡</sup></b>	Math 361 (Differential Equations) Math 342 (Applied Statistics)
<b>Math Courses offered every Spring</b>	Math 353 (College Geometry)

\*Physics 330/331 (Analog & Digital Electronics+Lab) has been split into two courses, which have been running as Physics 330/331 (Analog Electronics) and Physics 496/303 (Special Topics: Digital Electronics/Microprocessor Lab). Either counts toward the degree requirement. Engineering/Industry track students are **strongly urged** to take both.

‡ All other math classes required for a physics degree (Math 253,254,255,355, and for Math minors Math 280) are offered every semester. Only BSE students need to take College Geometry and Applied Statistics.

### COMMENTS ON UNIQUE REQUIREMENTS, COURSE EQUIVALENCIES, and MINORS

You are also required to take several courses in other departments. In certain situations, we will accept (and sometimes encourage) equivalent courses.

—**Required or strongly recommended Math courses:** Math 253 (Calculus I), 254 (Calculus II), 255 (Vector Calculus)\*, 355 (Linear Algebra), 361 (Differential Equations). Take these courses as early as possible. Given the fact that physics students have to take so many math courses, many opt to be a math minor. If you take the list above, you only need to add Math 280 to become a math minor. However, it is informally possible to replace Math 280 with a different math course. Check with your advisor.

—**Programming course:** The Physics Department requires (at least) one programming course, which we would encourage you to take as soon as possible. The current requirement is CompSci 173 (Programming in FORTRAN), but it may be possible to replace this with CompSci 172 (JAVA), CompSci 174 (C++), or a new course being developed called Scientific Computing. Check with your advisor.

—**English Composition course:** The Physics Department requires one advanced writing course, either English 370 (Advanced Composition) or English 372 (Scientific and Technical Writing). We strongly encourage you to take the English 370 course rather than English 372.

—**Chemistry:** Students in engineering/industry tracks need to take the Chem 102/104 series. You should take these at the first opportunity that does not conflict with a math or physics class.

—**Foreign Language:** Although not a requirement, the department strongly encourages you to take a year of foreign language while at UW-Whitewater. For students interested in the dual degree program, two semesters of a foreign language at UW-Whitewater (or two years of a foreign language in high school) is required to move from UW-W to either UW-Madison (and for some programs, UW-Milwaukee).