

A Guide to the First Year in the B.S.E. Program

Fall 2024

**School of
Engineering
and Applied
Science**



PRINCETON

Note: This guide is not a substitute for face-to-face advising. Students should meet with their academic advisor AS OFTEN AS NECESSARY to discuss their goals, concerns, coursework, and progress in the B.S.E. program.

You are required to meet with your adviser at the start of the fall term and later in the fall term when choosing courses for the spring term. You are strongly encouraged to meet with your adviser at the start of the spring term to assess your experience in the fall term and discuss your possible choices of majors.

Instead, this handbook complements the advice from your adviser and other members of your advising team to provide context and to fill in gaps, as well as to provide useful tips for academic success.

Disclaimer: In the event of unintentional discrepancy, the information in this handbook is superseded by Princeton University documents-of-record such as the *Undergraduate Announcement* and by the official guides and webpages of the six engineering departments.

Please send all suggestions for improving this handbook to the SEAS Undergraduate Affairs Office, BSEprogram@princeton.edu .

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1. Engineering at Princeton

Now that you have arrived at Princeton as a candidate for the B.S.E. degree, or have transferred into the B.S.E. program in your first year, it might be helpful to know what you have signed up to study.

What is Engineering?

There are many definitions of “engineering” but the broadest is that engineering *seeks to apply the principles of math, science, and other relevant disciplines to the solution of the challenges that face humanity*. These solutions may take the form of structures, machines, processes, or networks, or they could also be computer applications or the optimization of complex systems. “Design” is a word that separates engineering from the sciences: engineers design things using the tools of math and science, within the methods that define each engineering discipline.

Studying Engineering at Princeton

At Princeton, the Bachelor of Science in Engineering degree offers a rigorous education in the principles of engineering science and math combined with a strong component of the liberal arts. The B.S.E. degree is offered in six departments: Chemical and Biological Engineering (CBE), Civil and Environmental Engineering (CEE), Computer Science (COS), Electrical and Computer Engineering (ECE), Mechanical and Aerospace Engineering (MAE), and Operations Research and Financial Engineering (ORFE). The Computer Science department also offers the A.B. degree. Every student has a single major, but they are also able to pursue one or more certificate programs/minors,¹ not necessarily connected with engineering.

How the B.S.E. Program is Structured

It is true that the B.S.E. program has more sequential structure and prescribed courses than the A.B. degree program. This does not mean that it is inflexible, however. Although there are required first-year courses and departmental core courses, there is considerable room for electives within your major and outside of engineering requirements. Although each student experiences the program of study in different ways, the four years follow a clear pattern to provide a vertically-integrated academic experience. B.S.E. students are able to take more than the minimum of humanities and social science courses, pursue certificate programs/minors, and study abroad.

The First Year

The first year of the B.S.E. program is common to all six engineering departments. It consists of two terms of physics, two terms of math, a term of chemistry (or two, if interested in CBE), a term of computer science, a writing seminar, and humanities and social science electives. During their first year, B.S.E. students take advantage of opportunities to learn about the different departments so that they can make an informed choice of major at the end of the spring term.

¹ The current certificate programs are in the process of transitioning to minors, and new minors are being established. For the moment, they are very comparable, hence the usage “certificate programs/minors” here.

Sophomore Year

In the sophomore year, students take the foundational courses in their chosen department (usually one or two per semester) that teach the principles of engineering science, as well as finishing any remaining math requirements, and taking more humanities and social science electives. Sophomore year is a good time to think about special tracks in your department, certificate programs/minors, studying abroad, and other academic opportunities in the junior and senior year.

Junior Year

During the junior year, students take departmental courses, both core requirements and electives. In most B.S.E. majors, there is a course in design and opportunities for junior independent work. Students also continue taking humanities and social science electives or pursue certificate programs/minors. Study Abroad opportunities are available in all engineering disciplines, although departmental requirements may dictate in which semester it is possible to go away.

Senior Year

In senior year, B.S.E. students take advanced departmental courses and do independent work. Depending on your department, independent work may take the form of a one-semester exercise but most commonly it is done as a two-semester thesis or project. You will carry out whatever research, design, fabrication, prototyping, simulations, statistical analyses, programming, or modeling is necessary to address your topic and contribute to knowledge. You should also take advantage of your final opportunity to take humanities and social science courses at Princeton.

What do B.S.E. Students Do Over the Summers?

Summers are the time to obtain experience and to earn some money. Ideally you will learn something about your interests and about yourself. Do not feel that your summers all have to be devoted to engineering in some form. Many students pursue multiple activities, including research, employment in industry, summer courses, and travel (not at the same time, of course). After the first year, you may find that companies are not yet eager to hire you, although you should explore possibilities nonetheless. After sophomore year, they start getting more interested, and after junior year, they will be much more interested, for they hope that you will consider working for them after graduation. If you are attracted to research, obtaining some experience is important. Watch your e-mail for opportunities throughout the year. You also need time to relax and recharge, so make sure you include that in your summer plans.

What do B.S.E. Students Do After Graduation?

B.S.E. grads head in many directions. About 20% like what they see their professors do, engineering as a research science, which involves going to graduate school and getting a Ph.D. Another large group will practice engineering by going to work for a company that makes a product or provides a service. Others use their engineering education as a basis for careers in finance and consulting. Grads pursue many other paths. Some start a company. Others play professional sports. Theater, music, and film-making have all been career paths. Medical school and law school attract some B.S.E. students, as well as military service. Princeton engineering graduates have even become priests, ministers, and rabbis.

2. Basic Information to Get Started

Important Terms and Abbreviations

| | |
|-------------|--|
| SEAS | School of Engineering and Applied Science, founded in 1921, comprised of six departments, pronounced “seas” |
| B.S.E. | Bachelor of Science in Engineering degree |
| A.B. | Bachelor of Arts degree |
| CBE | Department of Chemical and Biological Engineering |
| CEE | Department of Civil and Environmental Engineering |
| COS or CS | Department of Computer Science, pronounced “kos” |
| ECE | Department of Electrical and Computer Engineering (formerly ELE or EE) |
| MAE | Department of Mechanical and Aerospace Engineering |
| ORFE or ORF | Department of Operations Research and Financial Engineering, pronounced “orf-ee” |
| ChemE | Chemical Engineering, old name of CBE, although still sometimes used conversationally |
| E-Quad | The Engineering Quadrangle (1962), home to CEE, CBE, ECE, MAE, Keller Center, and deans |
| CS Building | The Computer Science Building (1989), home to Computer Science, of course |
| Friend | The Friend Center for Engineering Education (2001) |
| Sherrerd | Sherrerd Hall (2008), home of ORFE and the Center for Information Technology Policy |
| ACEE | Andlinger Center for Energy and the Environment (2015), corner of Olden and Prospect |
| ABET | ABET, Inc., accreditors of engineering programs of study (see below; pronounced “A-bet”) |
| FC | Friend Center room number prefix (e.g. FC 113, also known as the Convocation Room) |
| A-B-C-D-E-F | When it appears before a room number, the letter refers to the wing of the E-Quad; in general, the letters map to departments as follows: A – CBE; B – ECE; C – Dean’s Office, and other shared facilities; D – MAE; E – CEE; the ECE teaching lab and the new Robotics Lab is the F-wing; you will discover where the G and H Wings are in the fullness of time.) |

Communication

E-mail is the standard form of communication to and from University offices. It is your responsibility to check your Princeton e-mail daily and respond to messages that request a response. Don’t expect an

instantaneous response from professors, since they have many competing demands on their time, but they should respond at the earliest possible moment. If you do not hear back within a reasonable period of time, say 48-72 hours, you should feel free to send a polite follow-up e-mail. **Please do not, however, say that you are “bumping this e-mail up” – professors and deans think this is impolite.** Just resend the original message as a gentle reminder. Please note that most faculty and staff do not check e-mail on weekends and holidays as often as on workdays.

A few hints:

- Always include a subject line that says what you are writing about. “Advice needed” is not helpful, but “Advice needed about Physics 103” says that it is important and probably urgent.
- E-mail etiquette makes a good impression. Err on the side of formality in address. Most faculty members hold the title of Professor, and even if they don’t have that title officially, there is nothing wrong with using it anyway. You can’t go wrong with “Dear Professor (last name)” or “Dear Dean (last name)” to start an e-mail. If it feels right, you can say “Hello, Professor” or even “Hi, Professor”.
- Never write “Hey, Professor” or just “Hey” to start a message. For some reason, “Hi” and “Hello” do not annoy faculty members and deans the way that “Hey” does.
- Don’t use first names to address faculty unless given a clear signal that it is OK, even if that was permissible at your high school.
- Keep e-mail short and direct. Any message longer than five sentences or so is really something you should discuss in person. If the recipient needs more information, that can be supplied in a follow-up message.
- Write in full sentences, with proper punctuation and capitalization, without text-message abbreviations.
- You can find the e-mail of faculty members and deans by searching their name on the Princeton University website by clicking on the search icon in the upper right of the homepage.

The telephone is still a useful means of communication, and some faculty members prefer it to e-mail. Always leave a voice mail with your name, phone number, and/or e-mail. Don’t just hang up!

Faculty members and deans generally do not live in the world of TikTok, Instagram, Snapchat, Discord or other social media unless they let you know otherwise.

The SEAS Undergraduate Affairs Office routinely broadcasts e-mail with important information and upcoming events. Please do not discard such e-mail without first taking at least a cursory look at it, and in most cases reading it. It is always relevant to some portion of the student population. Please do not try to send a message to these lists yourself since you will just get an error message. Dean Bogucki is open to requests to forward information on behalf of student activities and organizations, and he will broadcast an e-mail with the policies on this early in the fall term.

Accreditation and Licensure

Engineering programs of study are accredited by the Engineering Accreditation Commission of ABET, <https://www.abet.org>. Engineering programs of study are the criteria under which the curriculum, faculty, and other elements of instruction are evaluated, and may not match the titles of Princeton departments. Accredited programs of study are offered in the following areas:

- Civil Engineering: programs of study offered by the Department of Civil and Environmental Engineering except for the Engineering and Liberal Arts track and the “architecture focus” option under the Architecture and Engineering track; if in doubt, consult the director of undergraduate studies;
- Chemical Engineering: the full undergraduate program of the Department of Chemical and Biological Engineering;
- Electrical Engineering: the full undergraduate program of the Department of Electrical and Computer Engineering;
- Aerospace Engineering: offered by the Department of Mechanical and Aerospace Engineering;
- Mechanical Engineering: offered by the Department of Mechanical and Aerospace Engineering.

The Department of Computer Science, as is the case with Computer Science departments at many of our peer institutions, chooses not to pursue ABET accreditation. ABET accreditation criteria do not exist for Operations Research and Financial Engineering as it is offered at Princeton. Degrees from both these departments are of course fully accredited under the University’s overall accreditation by the Middle States Commission on Higher Education.

Depending on the career they pursue, some B.S.E. graduates eventually seek professional licensure granted by state (U.S.), provincial (Canada), or national (rest of world) boards. After taking a series of exams and working for several years, licensed engineers are awarded the title of P.E. (“professional engineer”) which certifies their competency in engineering practice. Professional licensure is mainly relevant to graduates of Civil and Environmental Engineering, although graduates from CBE, MAE, and ECE will occasionally seek it as well. At this early stage in your undergraduate career, licensure should not be a major concern except to know that this process exists and that graduation from an ABET-accredited program is necessary.

The Unknown Unknowns (or, Questions You Should Ask in the First Year)

Some B.S.E. students have told us that they wish they had asked more questions earlier in their first year. One said, “We don’t know what we don’t know.” In order to try to address this, here are some questions that you should think about and discuss with your advisers, friends, assistant deans in the colleges, and other helpful people.

- **What appeals to me about studying engineering?**
- **What does majoring in engineering involve?**
- **How is engineering different from the sciences?**
- **What sort of engineering do I want to pursue as an undergraduate major?**
- **What kinds of courses do I take after the first year?**
- **How do I find out more so I can choose a department wisely?**
- **What else would I like to study at Princeton?**
- **Am I eligible for Advanced Standing? Should I be interested in it?**
- **Are there certificate programs/minors that might interest me?**
- **Can I play a sport and be an engineering student? (Yes!)**
- **Do I want to study abroad? Where?**
- **Am I interested in medicine as a career? In law? In music?**
- **What would I like to do next summer? Where?**
- **How do I make connections with other engineering students?**
- **How can I get involved with engineering student organizations?**
- **What do engineering students do after they graduate?**

This is not an exhaustive list of the questions that should be on your mind, but it is a start. You will find that the information in this handbook will be helpful in framing answers to them, but they will also require reflection and consultation on your part.

3. B.S.E. First-Year Advising

Central to the academic experience of B.S.E. first-year students is your faculty adviser. This section will explain how advising works during the time between when you begin the fall semester and when you choose an engineering department in the second half of the spring semester.

Who is My Faculty Adviser?

Your adviser is a member of the faculty in one of the six engineering departments. Faculty members teach several courses a year, advise independent work and senior theses, and do cutting-edge research in a field of engineering. Your adviser is a fellow of your residential college. Based on information you have provided, we try to assign you to an adviser with similar interests, although this is not always possible. Since the B.S.E. first-year program of study is common to all six engineering departments, whether or not your adviser is in the department in which you eventually intend to concentrate should not be a problem. You are always welcome to seek specific departmental advice from the director of undergraduate studies and other faculty members in areas that interest you.

After spring break, you will part ways with your first-year adviser and meet with an adviser in the department in which you choose to major. Information about this process will be sent immediately after spring break.

Role of the Adviser

The primary role of the B.S.E. faculty adviser is to advise you on your choice of courses during the first two semesters and to help you think about your academic goals and direction. Consider your adviser to be your guide in getting off to a good start in the B.S.E. program. We hope that you develop a cordial working relationship with your adviser and feel comfortable asking candid questions about your program of study and how to succeed in your academic pursuits.

A few notes of caution, however: You are ultimately responsible for making choices about courses, based on degree requirements and your preparation. Although B.S.E. advisers have considerable experience, they do not possess encyclopedic knowledge of the entire Princeton curriculum. For that reason, you should seek additional advice from other knowledgeable sources if you find that you have reached the limit of what your adviser can tell you.

What to Expect from Your Adviser

The advising relationship is a collaborative effort between you and your adviser. In order to accomplish this, you can expect the following from your adviser:

- A wise perspective on programs of study and long-term plans;
- Respect for different levels of academic preparation and interest;
- Knowledge of B.S.E. first-year curriculum and requirements; working knowledge of placement criteria; knowledge of other sources of authoritative information;
- Availability during regular posted office hours, additional office hours during key

- enrollment periods, and timely e-mail response to questions;
- Familiarity with the academic support services and resources on campus and knowledge of where to direct an advisee for more information;
- Willingness to be asked for a letter of recommendation for a summer job or research opportunity and enough knowledge of the advisee to write a letter appropriately reflecting an advising association;
- Maintenance of confidentiality about the advising relationship.

Your adviser should take a sincere personal interest in your academic goals and aspirations and should listen to your concerns to refer you to other sources of advice and help. You should help your adviser get to know you by staying in touch and coming prepared to meetings.

Advising Meetings

You are required to meet with your adviser at least twice, although we hope that you get together more than that. Before classes start, you will meet with your adviser to select courses for the fall term. During November-December, you will have another meeting with your adviser that is scheduled at your mutual convenience to choose courses for the spring term. Outside these mandatory meetings, you should feel free to contact your adviser whenever you have a question or concern. While advisers are encouraged to reach out to their advisees, you should also take the initiative to contact your adviser. It is generally best to send an e-mail with a clear subject line, and if you don't receive a timely response, you should write again to arrange a time to meet.

Preparing for Meeting with Your Adviser

If you are meeting with your adviser to discuss courses, please think about your program of study in advance of your advising appointment and prepare a couple of tentative programs of study based on the B.S.E. requirements and the various options you have for electives.

Your principal source of information on courses will be the webpage known as *Course Offerings*, which is linked from TigerHub, at <https://registrar.princeton.edu/course-offerings>. In TigerHub, you can compose tentative programs of study using Course Planner. Several student-developed schedule-building apps also exist, and your Interactor or Residential College Adviser can direct you to them. Please note that student-developed apps might not be up-to-date or may contain erroneous information about requirements. Relying on an unofficial app is not a reason for an exception for making the wrong course selection.

Come prepared with a list of other questions that you have about your studies at Princeton. Your adviser can answer them or may refer you to someone who can.

Engineering Interactors

Working with each B.S.E. faculty adviser are one or more juniors and seniors known as Interactors. You will meet them during advising and when you arrive on campus. The role of the Interactor is to provide an opportunity for first-year students to meet B.S.E. juniors and seniors throughout the year and to provide a connection to the community of students, staff, and faculty that make up the School of

Engineering and Applied Science. Interactors can provide their perspectives in the engineering experience and guidance on how to manage challenging course loads, balance academics and extracurriculars, and find academic support.

Please regard your Interactors as a valuable resource as you think about your intended department. Remember, that even if they are not majoring in the department you're thinking about, they certainly have friends who are, and they can direct you to them.

Interactors also arrange informal gatherings of your advising group, for example for pizza or ice cream. Take advantage of these opportunities to meet fellow B.S.E. students and have fun at the same time.

Other Sources of Authoritative Advice

Many publications and websites list all the sources of advice that complement what you receive from your faculty adviser and interactors. Many of these can be found on the websites of the residential colleges. The *Class of 2028 Academic Guide* has an excellent catalog of advising resources along with an outstanding Frequently Asked Questions format.

Key sources of additional advice for B.S.E. first-year students:

- Dean Bogucki is happy to answer questions to which your adviser might not know the answer. Write to BSEprogram@princeton.edu and either he will respond or Ms. Traci Miller will arrange a time to meet with him.
- The assistant dean for studies in your residential college is knowledgeable about the B.S.E. curriculum as well as a key resource for discussing general academic concerns and referring to academic support;
- Peer Academic Advisers in your residential college have received training in the B.S.E. curriculum or may even be B.S.E. students themselves. Some of the RCAs are also B.S.E. students.

4. Choosing Fall Term Courses

This section provides practical advice about the B.S.E. curriculum, placement, advising.

Procedures

After you have spent the summer thinking about your courses for the fall and reviewing online information, you should prepare a couple of tentative programs of study for the fall based on the B.S.E. requirements discussed below. Between August 5 and 19, you will have a Zoom meeting with your adviser. Your adviser will provide dates and times from which you can select an appointment. The outcome of that meeting is a schedule of courses in which you will start the fall term. On August 27, you will log on to TigerHub, the Registrar's enrollment system, and enter your course selections. Classes begin on September 3.

During the first two weeks of class, you can make changes. Changes of section and time can be worked out internally within the course. Changes of course (e.g. from Physics 105 to 103) require approval of your adviser. The Math department requires that you check in with them as well so they can keep track of how many students are enrolled in each course.

Advanced Placement

Your adviser will have the AP and IB scores *that have been reported to Princeton electronically*. If your adviser does not have them, then they haven't been reported to Princeton, so you need to take steps to get them reported electronically. We will accept your personal report of scores for choosing courses for the fall term, but we need the official report to support the placement. Detailed instructions on how to do this are available at <https://advising.princeton.edu/placement/advanced-placement>. Students with British A-level scores must bring the certificate to their residential college office so it can be recorded.

Advanced placement is awarded by Princeton departments based on their own criteria. Criteria for AP are summarized in the document at <https://advising.princeton.edu/placement/advanced-placement/ap-table-class-2028>. **A departmental Requirement Fulfillment Test is required in Physics regardless of your scores. A placement test may be needed in Chemistry depending on your score.** Information about placement tests can be found in Path to Princeton. Math preparation beyond BC Calculus (e.g. previous study of multivariable calculus) must be discussed with the Math Placement Officer, who will provide written documentation of placement beyond the 100-level. The maximum number of terms of AP credit awarded in any subject is two.

Note that placement into COS 217/226 on the Computer Science placement test does not in itself satisfy the BSE computing requirement, which must be fulfilled by taking COS 126, 217, or 226, or ECE 115.

Program of Study

The first-year year program of study is common to all six B.S.E. majors. It consists of two terms of physics (103-104, 105-106, or EGR 151-153), two terms of math (103-104 (or EGR 152), 104-201, 201-202, or equivalent), one term of chemistry (201 or 207), and one term of computing (COS 126 or ECE

115). Students with AP credit in physics, math, and chemistry can use it to place out of some of these requirements. See Figure 1 for a “standard” first-year program.

B.S.E. students normally take physics, math, and chemistry in the fall along with an elective course or a writing seminar, while in the spring they take physics, math, and computer science along with two elective courses or their writing seminar and an elective. Students who need a second semester of chemistry because they are headed to CBE or are premed will have to replace one of their electives with Chem 202 or possibly put off computing to sophomore year.

Why do students in ORFE and COS have to take physics and chemistry? First, it’s the Bachelor of Science in Engineering degree. Second, the discipline of thinking systematically about complex unstructured problems is directly transferable to other analytical disciplines, even if the subject matter isn’t a prerequisite.

Note: B.S.E. math, science, and computing requirements may not be taken on a Pass-D-Fail basis.

Physics

The B.S.E. general physics requirement of two terms of general physics is satisfied either through AP in physics or by taking a two-term sequence of calculus-based first-year physics courses: Physics 103-104, 105-106, or EGR 151-153 (see Table 1 for a guide to options.) Most students take 103-104. There is no partial AP in physics, so you need two units of AP (from the departmental Requirement Fulfillment Test) to satisfy the requirement.² Otherwise please plan to take one of the two-term sequences along with most of the other B.S.E. first-year students. About half the few B.S.E. students with AP in physics elect to forfeit the AP credit (and thus eligibility for Advanced Standing) and take one of the two-term sequences anyway, while the other half use the AP credit to free a space for a different course (and also to retain their eligibility for Advanced Standing). A handful of students will take the ISC 231-234 sequence to fulfill the general physics requirement. While this is acceptable for intended majors in Computer Science, ORFE, and CBE, please be aware that these courses are very intense. If you have some AP credit (e.g. in chemistry), consider whether satisfying the general B.S.E. requirement with it will provide greater curricular flexibility, particularly in the humanities and social sciences.

² Physics offers two different exams for BSE students with strong physics preparation. Most will take the Requirement Fulfillment Test which certifies that a student knows an equivalent amount of physics to place out of Physics 103-104 and need not take general physics for the BSE requirement. The other test is a placement test to determine eligibility for Physics 207, which should only be taken by a student who is really, really good in physics and might be interested in studying it further at the 200-level and above. Satisfaction of the BSE requirement with the 103-104 Requirement Fulfillment Test does not automatically give eligibility to take Physics 207. Consult the Physics department with questions.

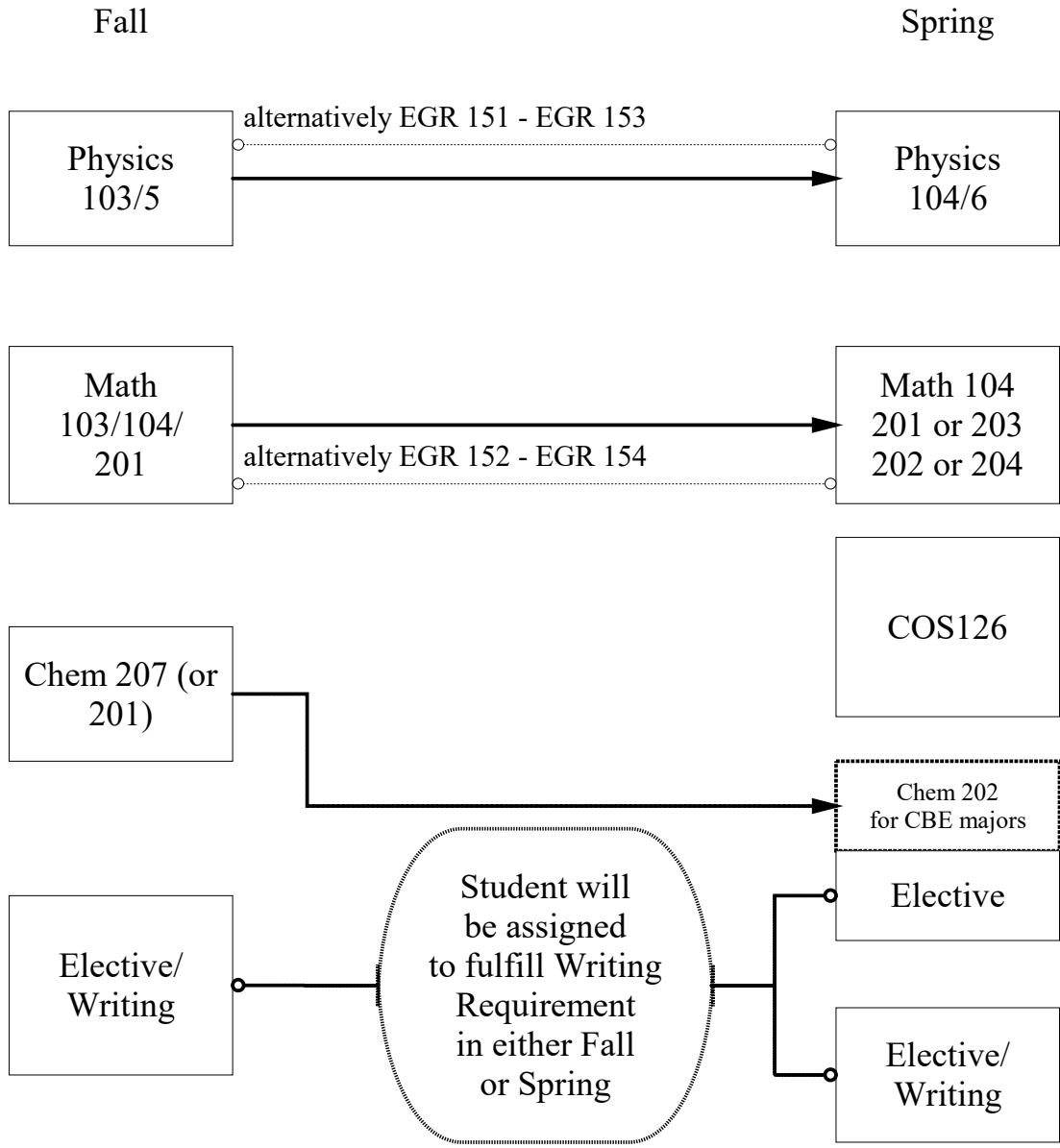


Figure 1. The "standard" B.S.E. First-Year Program

| Courses | Placement | Comments |
|---|---|---|
| Physics 103, General Physics I, leads to Physics 104 in spring | High-school physics, calculus | Calculus-based treatment of mechanics taken by many generations of B.S.E. students. |
| Physics 105, Advanced Physics (Mechanics), leads to Physics 106 or 104 in spring | Strong high school physics and calculus (many students in the course have AP/IB/A-level preparation in physics) | More theoretical treatment of material of Physics 103 suitable for students with keen interest in physics, either by majoring in physics or the Engineering Physics certificate. |
| EGR 151, Foundations of Engineering: Mechanics, Energy, and Waves (taken in conjunction with EGR 152, Foundations of Engineering: Mathematics of Shape and Motion). Leads to EGR 153 in the spring. | High-school physics, calculus; open to first-year B.SE. students only WITHOUT AP credit in physics and WITHOUT placement into multivariable calc. If you are taking Math 201, then Physics 103 is the appropriate physics course. | A rigorous foundation in mechanics, energy, waves, and thermodynamics motivated by developing engineering solutions to global challenges. |
| ISC 231-234, An Integrated, Quantitative Introduction to the Natural Sciences (231-232 in fall, 233-234 in spring) | Math placement into multivariable calculus, very strong high school science preparation | Mathematically and computationally sophisticated introduction to physics, chemistry, and biosciences in a year-long four course sequence. WARNING: OK for COS, ORFE, and maybe CBE; not appropriate for ECE, MAE, and CEE due to gaps in content. NOTE: ISC no longer fulfills the B.S.E. computing requirement. |

Table 1. Guide to First-Term Physics Courses for B.S.E. students

Math

Math is crucial for engineering. The faster you complete the general B.S.E. requirements in math, the more options you will have in sophomore and junior year among departmental courses. Thus you must not skip math in the fall of your first year no matter how much AP credit you have. If you ask to defer math, expect very strong opposition from your faculty adviser. All engineering students complete a sequence of math courses through linear algebra, usually using a combination of AP credit and taking courses at Princeton. See the Math department's excellent page on placement at <https://www.math.princeton.edu/undergraduate/placement> and follow all the relevant links. See Figure 2 for a schematic outline of math courses relevant to the B.S.E. degree.

Guidance on which math course to take will be provided by the Fall Math Placement Orientation workshops on August 26. Based on this experience, you will be able to make an informed decision whether to enroll in Math 103, 104, or 201 the following day. Beforehand, however, you should think about which math course seems to be best given your background.

If your preparation in calculus is minimal or did not involve taking an AP course, you should begin in Math 103. That will be the longest route to completion of the math requirement, but it's better to get a good foundation rather than to push ahead. Many B.S.E. students who have taken a rigorous high school calculus course like AB calculus will start in Math 104. If your preparation is adequate for 104, it's very much in your interests to start there. EGR 152 can replace Math 104 if you have the preparation for Calc II.

If you took BC calculus and got a 5, the Math department now recommends Math 104 (in the past, a 5 would be a 201 placement.) You have to decide, with the benefit of the Fall Math Placement Orientation workshops, whether you have mastered Calc II sufficiently to progress to 201 or if you should take 104. Although it's not an absolute benchmark, one indication might be whether you have covered Taylor series. If not, then you might consider 104. See what you can determine from the Math placement webpage linked above and from the Fall Math Placement Orientation workshops.

Do not take Math 175! It does not count for the B.S.E. math requirements, since it is mainly for Economics majors and does not provide the foundation for subsequent engineering courses.

If you have taken a really thorough BC calculus course (or the equivalent A-level or IB-H exams) and received a 5 (or an A-level A or an IB-H 7), you are potentially prepared to take Math 201 at Princeton. 201 is multivariable calculus. 203 is a more "mathematical" treatment of multivariable calculus, involving proofs. Either one works fine for all B.S.E. majors. Note: EGR 156 is only open to B.S.E. sophomores who have completed EGR 152-154 in the first year.

Some students report they have studied multi beyond variable calculus already in high school or have taken a college course. Placement out of 201 requires written permission from the Math AP Officer, so contact this discerning individual during course selection. If possible, provide examples of graded tests and homework from your earlier coursework, as well as the syllabus and name of the textbook. If they determine that you have covered multivariable calc at a comparable level of breadth, depth, and rigor to the Princeton course, they will issue a written confirmation that you should take to your adviser. Same goes for prior study of linear algebra. Otherwise, you need to take the course here.

Math 214 and 215 do not satisfy B.S.E. math requirements, since they are not multivariable calculus or linear algebra. If you want to explore math as a possible major, we will not prevent you from taking one of these courses, but you will still have to take multivariable calculus and linear algebra later.

Chemistry

The B.S.E. degree requires one term of general chemistry or its equivalent. It is satisfied with one or two units of placement credit or by taking Chemistry 201 or 207. Chemistry 207 is the mainstream general chemistry course for B.S.E. students. Please note that its title and description have been revised for the fall of 2024. Chemistry 207 is not more difficult than Chemistry 201, despite the higher course number, but there is no problem with taking 201 if that works better for your schedule. If your intended program of study does not require further study of chemistry, and if you have placement credit or have taken 201 or 207, then your chemistry requirement is complete. If you are headed toward Chemical and Biological Engineering or if you are premed and take 201 or 207 in the fall, you will also

take Chem 202 in the spring. If you have 1 unit of placement credit in Chemistry and need more chemistry for CBE or premed, then you should plan to take Chemistry 215, which is offered in the spring.

**Math Placement Chart and Sequences for BSE students,
Fall 2024**

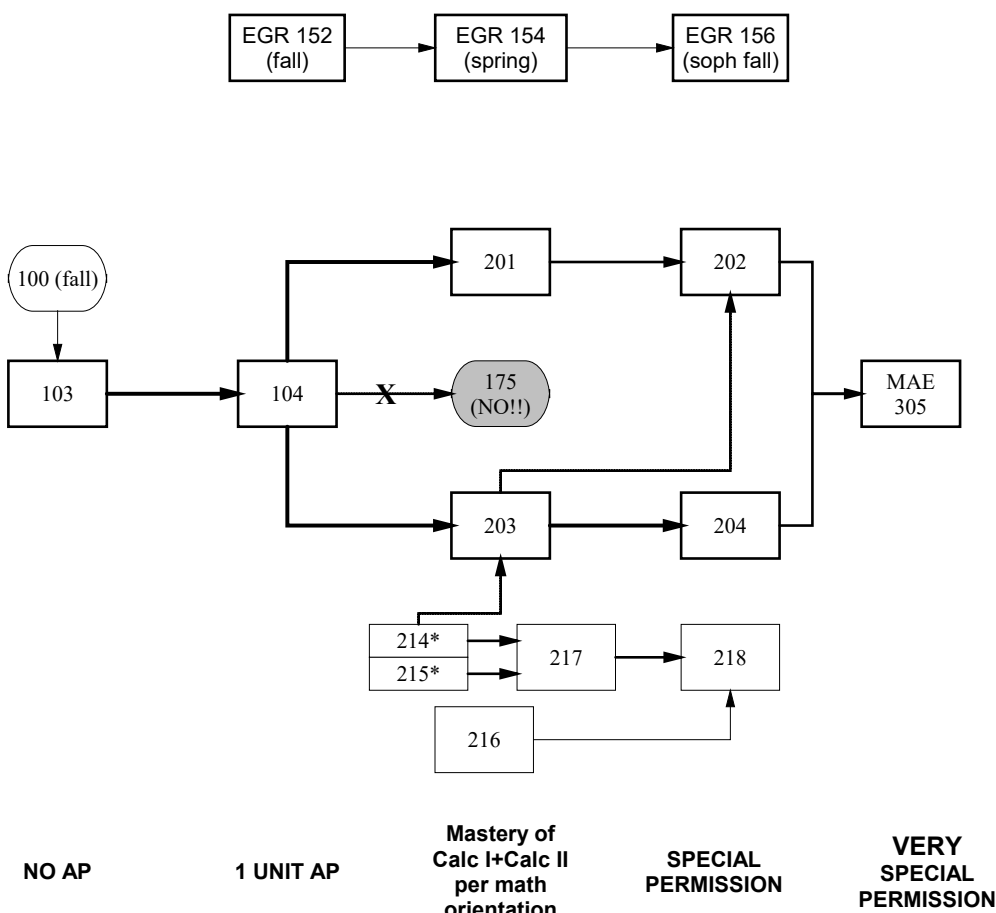


Figure 2. Math placement chart and sequences for B.S.E. students. B.S.E. students may not take Math 175. Math 214 and 215 do not fulfill B.S.E. requirements.

If you have a passionate interest in Computer Science and fully intend to major in that field, you may ask your adviser to be allowed to defer Chemistry 201/207 until the fall of sophomore year and take Computer Science 126 instead. Please understand that if you do this, you are complicating pathways to other potential majors (especially MAE), so this option is really only for students who have a single-minded focus on Computer Science as their only interest among the magnificent array of choices in engineering.

Beginning with the Class of 2026, Molecular Biology 214 is also accepted for this requirement. Please discuss with your adviser whether this is a viable option for your program of study. In CBE, if you do

not have AP in chemistry, you must take CHM 201 or 207 in the fall (you will take MOL 214 later on.) CEE has expressed a strong preference for chemistry over biology for this requirement. MOL 214 is a challenging and rigorous course, so do not view it as a softer alternative.

The Fourth Course

About half of the students in an entering class are assigned to take their writing seminar in the fall, and the other half in the spring. If you are assigned to take it in the fall, then your fourth course will be your writing seminar. If you are taking the writing seminar in the spring, then your fourth course in the fall can be almost anything. Take something interesting that you have not had a chance to study previously. Ideally, it will be in the humanities or social sciences, since another course that involves problem sets and quantitative analysis will be too much in one way of thinking. It could also be a freshman seminar. Humanities and social science courses at the 100- and 200-level work best. Some 300-level courses in the humanities and social sciences are open to first-year students with adequate preparation. Courses at the 400-level and higher are not appropriate for fall term first-year students.

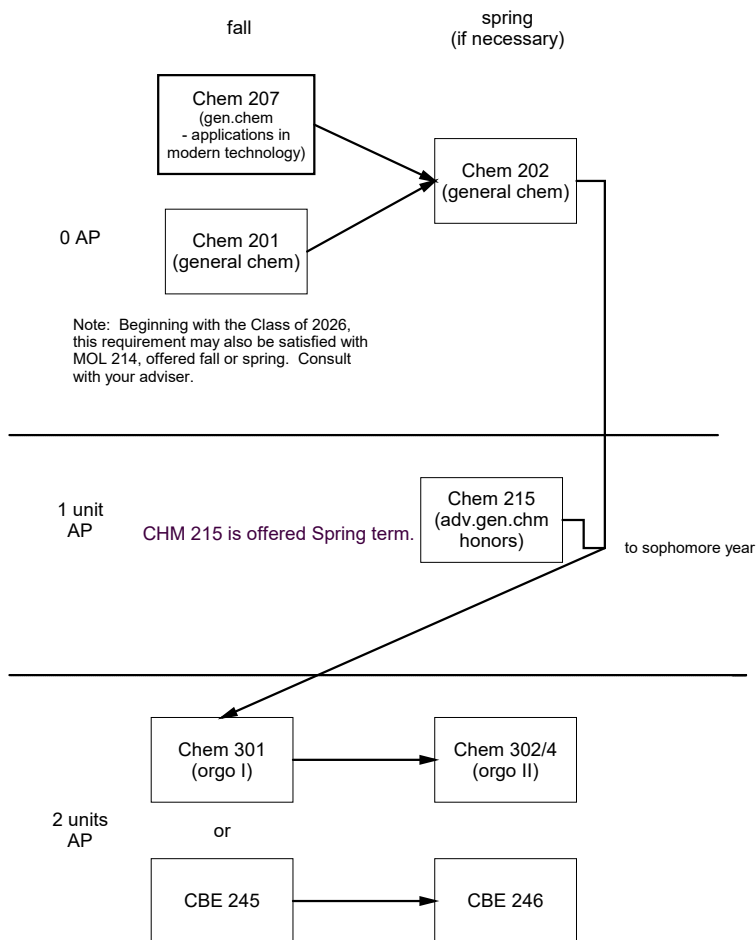


Figure 3. Chemistry placement chart and sequences

Taking Five Courses

Taking five courses in the fall of your first year is discouraged. The adjustment to the pace of Princeton courses and their academic expectations is difficult for even the best-prepared students, and you should get involved in extracurricular activities as well. B.S.E. first-year students normally take four courses in the fall and five in the spring. Better to get a strong start in four courses than a shaky start in five.

If you have a good reason for wanting to take five courses in the fall term, you may make a case as to why you should be allowed to do so. Your academic adviser and the associate dean for undergraduate affairs will consult on the matter and review your course choices and preparation. You should be prepared to drop a fifth course when the workload starts to build up.

The First Two Weeks of Classes

This fall, classes begin on Tuesday, September 3. Don't be alarmed if your courses seem hard at first. They are supposed to be challenging. At the same time, however, use the first couple days of classes to check your placements, especially in math. If you sign up for Math 201, and after the first classes you believe you are in over your head, there is no shame in switching to Math 104. Talk with the instructor, attend the new class to see if it's more appropriate, and formalize the change.

During the first two weeks of classes, you are allowed to make course changes with little difficulty and at no cost. Changes of section *within* a Math course (e.g. between 9 AM and 11AM classes in Math 104) should be arranged with the Math office in 315 Fine Hall and do not require the approval of an adviser. Changes between courses (e.g. History 211 to Politics 240) require consultation with your adviser.

By the deadline for free changes, your schedule should be set. After that date, entering a new course is generally impossible, while dropping a course requires consent of your adviser, and if it brings you below four courses, only with the permission of Dean Bogucki and your college's assistant dean. The dropping of a fourth course should be an emergency measure *of last resort* and must be done by the ninth week of classes only after you have determined there is no other course of action. It is not an option to be chosen casually. Please do everything possible to succeed in the course.

Advanced Standing

Policies for the Advanced Standing program are outlined on the following webpage:

<https://advising.princeton.edu/placement/advanced-standing>. Eligibility for Advanced Standing in the B.S.E. program depends on advanced placement in Physics, which in turn hinges on the Physics requirement fulfillment test. If you take PHY 103, PHY 105, EGR 151, or ISC, plan on spending the full four years at Princeton because you have forfeited your AP in Physics. While the word "forfeit" might sound scary, you will find that this is normally the best way to begin a proper Princeton engineering education. If you are eligible for two terms of Advanced Standing and want to graduate in three years, then you must begin a program of study immediately that follows a sophomore schedule in your intended department. This requires replacing physics and chemistry requirements with sophomore-level engineering courses, along with taking 200-level math courses. Direct questions about advanced placement and the Advanced Standing program to Dean Bogucki, BSEprogram@princeton.edu.

5. Succeeding in Your Courses

In this section, Dean Bogucki provides general advice, hints, tips, and accumulated wisdom on getting off to a good start in the fall term. The advice below is informal and may not apply to everyone, but if you follow it, you may have a smoother adjustment to the academic rigor and expectations of your courses.

What to Expect in Your Classes

Princeton science and math courses meet in a combination of lectures, classes, and labs. Physics 103 is usually taught in three classes a week, along with a one-hour demonstration lecture and a three-hour lab. Math typically has two 80-minute classes a week plus Friday precepts. Chemistry has two or three lectures a week, one class, and a three-hour lab. Computer Science 126 has two lectures and two weekly precepts. Each class is important. You should not miss a single one. If you do, then you must arrange to get the notes for that day, although that is a poor substitute for attendance.

Expect your courses to be challenging. You should not expect to understand everything intuitively. There will be homework problems that you cannot solve. Knowing the formula isn't the key to solving the whole problem. Problems may have multiple stages in which you will need to use the answer in the first stage to solve the second. Become accustomed to seeking help.

Calculus at Princeton is taught without using calculators. If you've come to rely on a graphing calculator to do calculus, you will have to adjust to doing without it.

Outside the Classroom

In general, you should plan on putting in about *twice as many* hours studying, working problems, and writing programs as you do in the classroom in your math, science, and computing courses. If you're not, then something isn't right. If your class hours in physics, math, and chemistry in the fall term add up to 16, then you should find at least 30 hours in your week to do homework, study, attend office hours, and work on extra problems. That's the difference between high school and college. In high school, you perhaps did little homework. In college, you do a lot outside of class.

Finding classmates with whom to study is a characteristic of successful students. The instructors will set limits on collaboration on problem sets, but in general, working together is much better than working in isolation. This may also be a big difference for you from high school.

Attendance and Assignments

Exception of some small courses (e.g. your writing seminar) attendance is not strictly recorded. That does not mean that you will not be missed! Faculty members can usually tell when someone isn't showing up for class or appears sporadically. If you disappear completely, they might assume that you dropped the class. This is not a good thing.

Never be late with assignments like problem sets and papers. They not only are important learning aids but they also let the instructor know that you care about the course. From them you can tell whether or not you are learning the material, and you then know when to go for help (see Office Hours

below.) In many courses, late work is not accepted without permission or after solutions have been posted. Don't expect to be allowed to submit late work.

The best thing is to keep a simple, cheap pocket calendar in which you *write* your class schedule and the due dates for assignments. Do not trust your memory or your phone to remind you about upcoming responsibilities.

Studying

Research has shown that there is a strong correlation between studying and academic success.³ There are no shortcuts.

Solve Physics Problems, Don't Memorize the Textbook

One of the mistakes that first-year engineering students make is trying to study physics as if it is AP Biology. In other words, they highlight the textbook and try to memorize terms and concepts. This does not work in physics! College physics is about solving problems so you can formulate new ones. Get rid of the highlighter, which is useless in any event (and degrades the resale value of your books, too.) Read the text once, and see how it relates to your lecture notes. Then start working problems. When you need to understand something about a problem, go back read the relevant passage of text. Then go back to the problem and work on it some more.

Work lots of problems, so you are comfortable with the discipline of solving them. If the answers are printed in the back of the book (sometimes they are, sometimes they aren't), don't look at them under any circumstances. Many students make a stab at the problem, look at the answer, convince themselves they know how it was obtained, and go on. Remember, the answers will not be on the back of the examination booklet.

Your goal is to become comfortable with understanding problems, setting up a plan to solve them, and working at them systematically. Odds are that the problem you see on the exam won't look like anything you've seen before, but if you are comfortable with the *approach* to solving problems, you can take it apart and plan how to solve it.

Office Hours are Crucial

All instructors are required to set aside time each week to meet with students in their courses. All students need to get used to going to instructors' office hours, a key academic resource at Princeton. Do you have a conflict with your instructor's scheduled office hours? Speak with your instructor about other mutually convenient times. Another meeting time can always be arranged.

Your instructors will not think less of you for coming to office hours. In fact, quite the opposite: they will appreciate that you care enough about mastering the difficult material and have made the effort. Bring homework problems on which you get stuck, or your lecture notes if something didn't make sense.

³ Stinebrickner, R. and Stinebrickner, T. (2008) The Causal Effect of Studying on Academic Performance. *The B.E. Journal of Economic Analysis & Policy*, Vol. 8 (Issue 1). <https://doi.org/10.2202/1935-1682.1868>

Don't be disappointed if instructors don't give you the answers to your questions directly. More likely, they will ask you questions or explain concepts until you see the way to the answer yourself. This is how college teaching should work.

Extracurriculars, Athletics, Jobs, Businesses

B.S.E. students participate in all forms of extracurricular activity. For the most part, their involvement does not affect their studies, and they have adequate time to pursue several rewarding activities. As always, your studies come first, and leadership or success in extracurricular life does not offset failing or low grades. If you find your grades slipping, it's time to rebalance your time allocation.

We are very pleased that many B.S.E. students participate in intercollegiate athletics, and we celebrate their accomplishments. Many engineering faculty members are part of the Athletic-Academic Fellows program. You may find, however, that balancing academic obligations with your athletic commitments is more difficult than in high school. At Princeton, academics always take precedence. Your coaches understand this. If you are having difficulty balancing athletics and academics, please speak with your coach, who will almost certainly be more accommodating than you might imagine. Usually rebalancing priorities and time management will enable you to keep up with your studies and continue your athletic activity. Dean Alec Dun is a tremendous resource for student-athletes, and you can find his contact information in the directory at the end of this guide.

Many students hold campus jobs. In addition to providing an opportunity to earn money, a campus job is a good way to make friends and get connected. Usually it's a fun break from your studies. You can't let a campus job take up too much of your time, however. We generally find that 10 hours per week is the most that a student can devote to a campus job and still have time for class, homework, studying, socializing, other activities, dining, and sleeping. Academic success at Princeton is not just about devoting the bare minimum to academic obligations but having the time to learn the material.

If you are planning on starting or running a business while studying engineering at Princeton, please think very carefully. Running a business properly and being a full-time student at Princeton are usually incompatible. Academics generally lose out and grades plummet, potentially ending your Princeton career prematurely.⁴ If you find yourself devoting more time to a business than to your studies, consider taking a leave of absence and resuming your studies after either (a) you have become fantastically wealthy by selling your business to Alphabet or (b) the idea has run its natural course and you can step away from it. If you want to be the next Mark Zuckerberg, that's fine, but don't mess up your academic record along the way.

Academic Support and Tutoring

If your instructor's office hours aren't sufficient, then there are other avenues of support. The review sessions and study halls in the McGraw Center provide clarification and on-demand group tutoring. See <https://mcgraw.princeton.edu/undergraduates/programs/tutoring> and follow links. Individual tutoring is also available through your residential college office for students who are finding the office hours and

⁴ These comments also apply to virtual internships during the academic year.

McGraw programs are still not enough. Tutoring from any other source is not allowed (see <https://rrr.princeton.edu/2023/students-and-university/24-academic-regulations>, section 2.4.5.)

Your residential college office and especially your assistant dean can be very helpful in directing you to sources of help. As always, we in the Undergraduate Affairs Office of the engineering school are happy to talk. Write us at BSEprogram@princeton.edu to see when would be a good time. We'll always ask you first, "Have you spoken with your instructor?", so you want to be able to say "Yes, I have."

Academic Integrity

You have already been told many times that Princeton takes academic integrity seriously. Let us repeat that one more time: Princeton takes academic integrity very seriously indeed. This means never, ever pass off the work of someone else as your own. In particular:

- Do not copy even a byte of text or computer code. Plagiarism is very easily discovered. Software in COS courses flags similar code, which is then closely compared by faculty.
- Do not reuse anything that you or anyone else did in a previous term or another course.
- Never look for answers on online solution sites and code repositories, and don't post your solutions there. GitHub is especially dangerous!
- Never download something online and pass it off as your own work.
- Cite your sources meticulously using a consistent citation system.
- Acknowledge any help you received such as feedback on drafts and discussions with others.
- Make sure you are fully aware of the Honor Code and of the regulations on academic integrity in *Rights, Rules, and Responsibilities* and *Academic Integrity at Princeton*.
- Read and understand the policies in each course on collaboration. When in doubt, ask the instructor. It is your responsibility to know where the boundary lies.
- If you are frustrated on an assignment, speak with your instructor. Assignments are hard in order to challenge you, and instructors are almost always sympathetic when you are being challenged.

It is better to take a low grade on an assignment than to be sent away from Princeton because you cut a corner. Leave ample time to complete your assignments so you are not under undue stress. **Make good choices.**

If you are tempted to use an AI program like ChatGPT to write a paper, think again. At the moment, it does not appear to be forbidden explicitly (although this may change), but Princeton students are expected to acknowledge all sources. Since large language models scrape the internet for information, how would that be possible? This might put you at risk. From what Dean Bogucki has seen, the writing that emerges from AI is pretty lifeless and soulless. Not to mention that ChatGPT appears to make things up sometimes. You want to do better than that. Write your own lapidary prose. The more practice you get, the better you will write.

6. Choosing Courses for Spring Term

After fall recess, you will meet again with your faculty adviser and select courses for the spring term. Either your adviser will reach out to you or you will contact your adviser to arrange a time to meet and have your schedule approved, and then on the specified day, log in to TigerHub to enroll. The following section provides guidance on that process. Keep in mind the list of questions from the start of this handbook and see if you have found answers to them.

Courseload

B.S.E. students are expected to take five courses in the spring term of the first year and finish the year with nine completed courses. Remember that general B.S.E. math-science-computing requirements may not be taken Pass-D-Fail.

Math

You will continue in the next math course that follows the one you are taking in the fall. If you are in 103, you'll take 104; if you are in 104, you'll take 201; if you are in 201, you'll take 202. If you took EGR 152, you'll take 154. If you took Math 215 this fall, then you still must take multivariable calculus and linear algebra, so take one of those courses in the spring (e.g. 217, 203, or 204, etc.; if in doubt, consult with the Math department about the appropriate next course.) Do not break the sequence of math courses. The sooner you finish your math requirements, the better background you will have for your sophomore and junior courses.

Physics

If you are taking 103 this fall, then you'll continue with Physics 104. If you want to take 106 after 103, then the Physics department will tell you what to do. If you are taking 105 in the fall, then you can take either 106 or 104 in the spring. EGR 151 is followed by EGR 153. Occasionally students with 2 units of AP in physics (based on the Physics department's Requirement Fulfillment Test) who took 103 anyway but found it repetitive prefer to take an advanced technical course in place of 104. If you're in this position, contact Dean Bogucki.

Chemistry

The B.S.E. general chemistry requirement is a one-semester requirement. If you took 201 or 207 this fall or have one or two units of placement you have satisfied the requirement. The open space in your schedule is generally occupied by COS 126. The only reason to take more chemistry in the spring is if you are interested in majoring in CBE or are premed, and either took 201 or 207 or have just 1 unit of placement. If you need a second term of chemistry to follow 201 or 207, then you should take 202 this spring. If you have one unit of placement in chemistry, you should take CHM 215 if you need a second chemistry prerequisite for CBE or premed. Otherwise you satisfied the B.S.E. requirement with AP credit.

Computer Science

The B.S.E. computing requirement is satisfied with 126 (or 217/226 if you persuade the CS department that you are prepared for them.) If you took 126 (or ECE 115) this fall and are interested in Computer

Science for a major, then you may take 217 or 226 in the spring, although these are often taken in sophomore year. Most students in this situation tend to take 226 first, leaving 217 to the fall of sophomore year. If you are taking Chem 202 or 215 in the spring, then you might consider leaving 126 to the fall of sophomore year, unless you plan to major in Computer Science.

Writing Seminar

If you didn't take the writing seminar in the fall, then you have to take it in the spring.

Humanities and Social Sciences

We hope you'll have some space in your schedule to take at least one humanities/social science course this spring. Consider fields of study that you haven't taken before, like philosophy or art history. Many B.S.E. students take freshman seminars.

Other Considerations

Students interested in ORFE might consider taking Econ 100. Although most ORFE majors take 245 in the fall of sophomore year, if you have space in your schedule to take it this spring, you might have some more flexibility later on. 500-level graduate courses are not open to first-year students.

Starting to Think about a Major

B.S.E. students officially choose a department in late April, after choosing courses for the fall. Almost all are able to make an informed decision by that point. There are a number of sources of information, including:

- Explore Engineering, the SEAS majors fair, in November.
- Engineering Departmental Open Houses in late March (watch for advertising!)
- Talking with your adviser, departmental faculty, your Interactors, other upperclass students.
- Several engineering student organizations usually organize study breaks with advice on departments from juniors and seniors.
- Departmental websites and undergraduate handbooks (all online). Some have videos of their students talking about their experiences. Watch them!
- Information in this guide, below.

Summer Courses

B.S.E. students may count up to four preapproved summer courses at other schools toward the 36 required for the B.S.E. degree. In practice, very few use all four, but occasionally some will take one or two. You will be sent an e-mail with a link to an information page about criteria and policies for summer courses and how to obtain pre-approval.

7. Choosing a Major

B.S.E. students choose a department at the end of the spring term of their first year. They do so when they select their courses for the fall of sophomore year by meeting with an adviser in their intended department, then confirming this choice when requested to do so by the Registrar in late April.

Due to the vertical integration of the engineering program of study (one of its key strengths), we ask B.S.E. students to join a department earlier than in the A.B. program. This pays off eventually in a strong foundation in engineering principles, the quality of independent work, opportunities to take advanced courses, and interactions with faculty members.

The School of Engineering and Applied Science has six departments: Chemical and Biological Engineering, Civil and Environmental Engineering, Computer Science, Electrical and Computer Engineering, Mechanical and Aerospace Engineering, and Operations Research and Financial Engineering. Each has its own methods and principles and forms a distinct community of students and faculty, although there is also overlap among them in topics such as materials, bioengineering, energy, and robotics.

You should choose a department in which you will have the most rewarding undergraduate experience. You will have many options after graduation, and with a few exceptions (discussed below) you will probably find that the actual consequences of your choice of department may fade over time and be eclipsed by the simple fact of your graduation from Princeton with a B.S.E. degree. Whatever your major, you will be well-served by having a technically-rigorous liberal education wherever life takes you.

Information about completing the rising sophomore academic planning form, meeting with a departmental adviser, choosing courses for the fall term, and declaring a major will be sent to you after spring recess.

Sources of Information

It is important that you become informed about the B.S.E. departments that interest you. Some students are absolutely certain of their choice already, while others are trying to decide among several possibilities. Here are some ways to obtain the information you need to make an informed decision:

Attend the Engineering Open Houses in late March. You will receive several e-mails about this event, and you should clear your schedule to attend. Each department has an informational program that is repeated several times during the evening, usually including demonstrations of independent work and tours of department facilities. The information presented at these open houses is invaluable in helping you learn about the departments you are considering.

Talk with juniors and seniors who are majoring in engineering. You already know at least one: your engineering Interactor. There are also B.S.E. students who serve as RCAs and peer academic advisers in your residential college. Get involved with engineering student organizations!

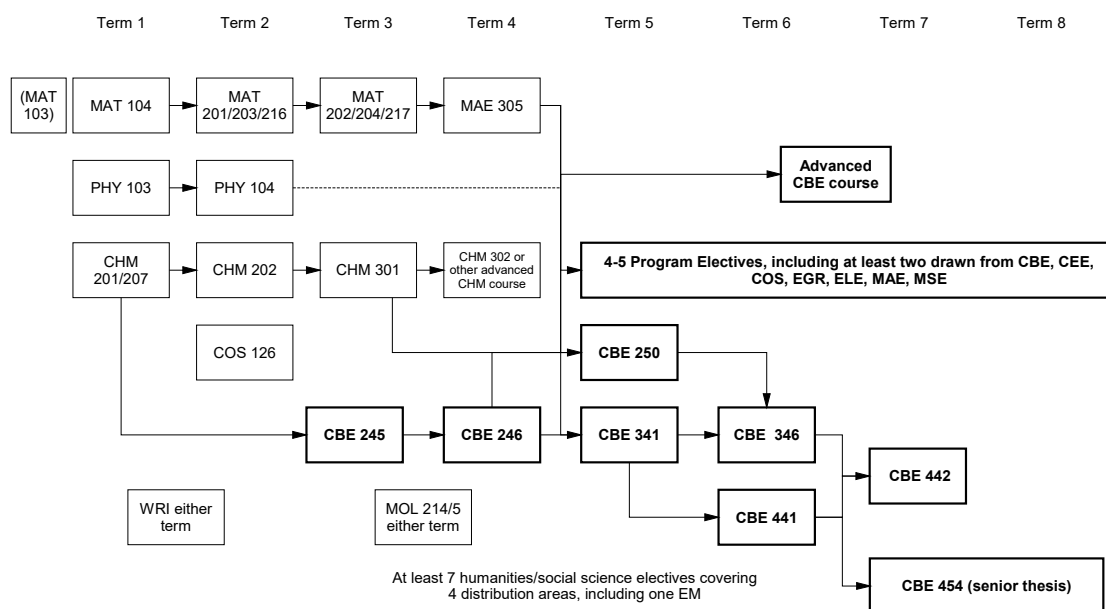
Look closely at the Undergraduate Handbooks and Independent Work Guides on the various departmental websites, which you can find by following links to “undergraduate” and “handbook” or “guide”. In particular, look at what students have done recently for independent work. Do any of these topics intrigue you, even if you do not yet understand the technical jargon?

Approach faculty members. Each department has a faculty member called the “director of undergraduate studies” who is the head adviser. They will have extended office hours or other opportunities to talk with students interested in their department. You will meet the director of undergraduate studies at the Open Houses in late March, and they will surely be willing to answer your questions.

Major Maps

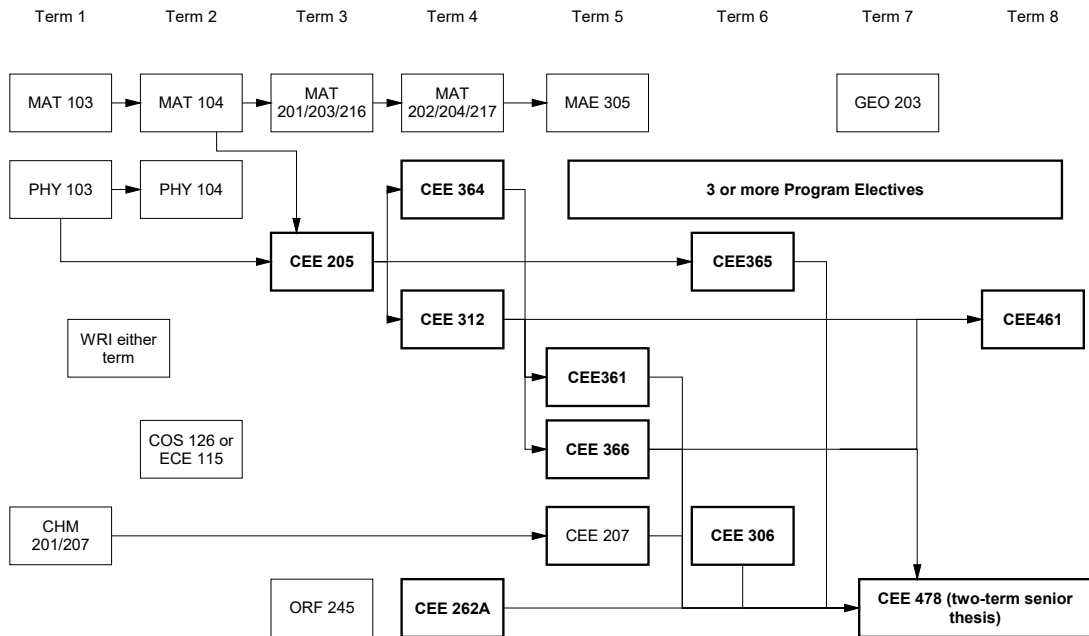
The diagrams below provide a schematic picture of the course sequence in each engineering department. Information in each department’s undergraduate handbook or guide takes precedence over these charts. Courses outlined in bold represent departmental core courses and technical electives. Course schedule changes from one year to the next may cause variation in these maps, but they provide a general idea of the key courses.

Chemical and Biological Engineering



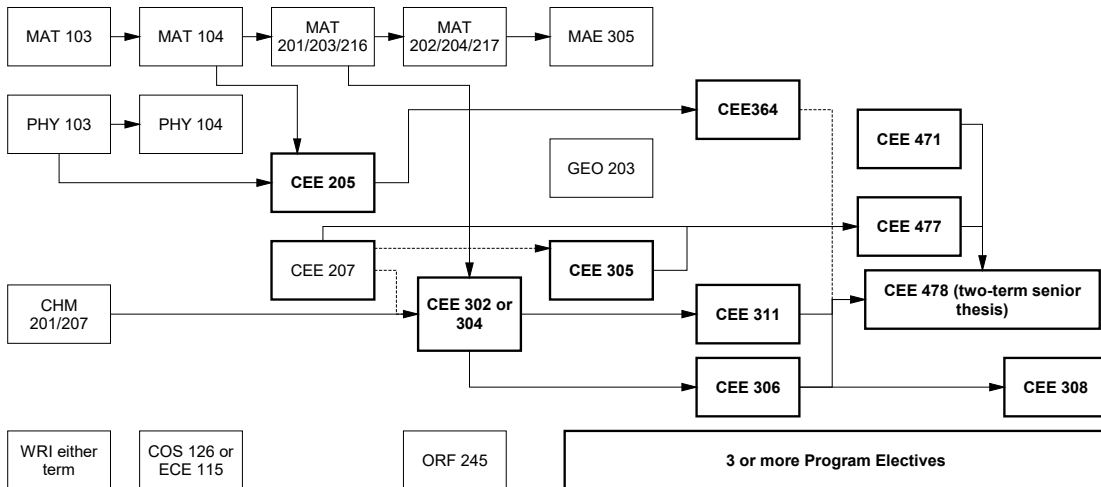
Civil and Environmental Engineering

Course sequences for the Structural and Environmental tracks in CEE are below. Architectural and Geological tracks are similar; consult the departmental undergraduate guide. The Engineering and Liberal Arts track permits a flexible program of study.



Structural

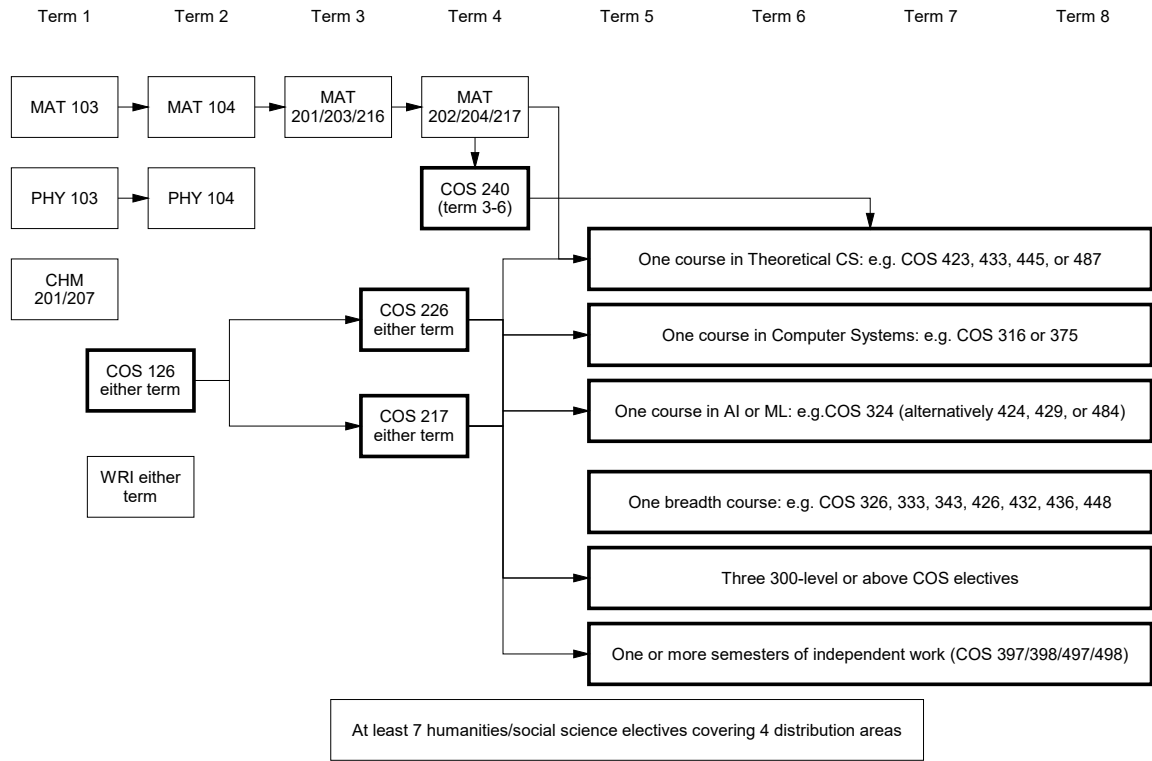
At least 7 humanities/social science electives covering 4 distribution areas, including one EM



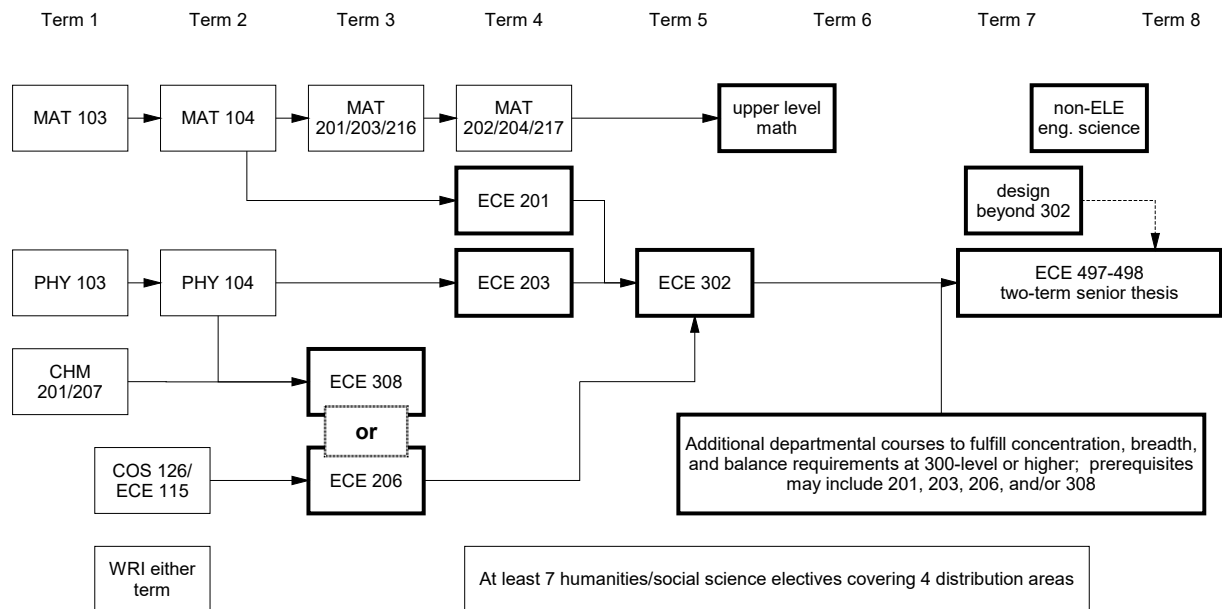
Environmental

At least 7 humanities/social science electives covering 4 distribution areas, including one EM

Computer Science BSE

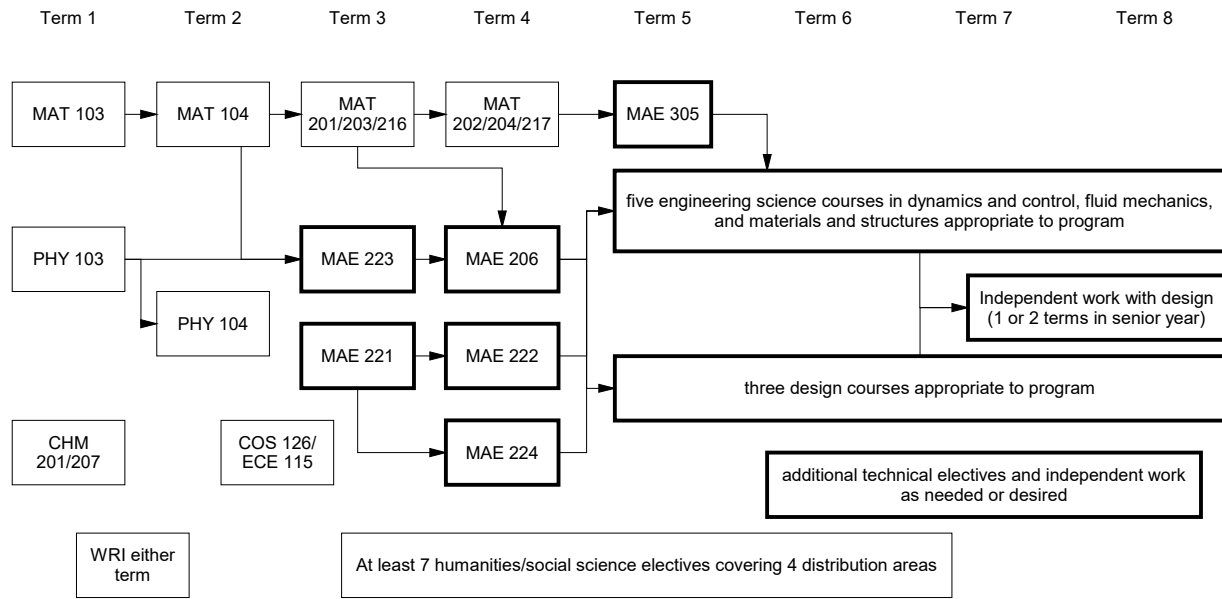


Electrical and Computer Engineering

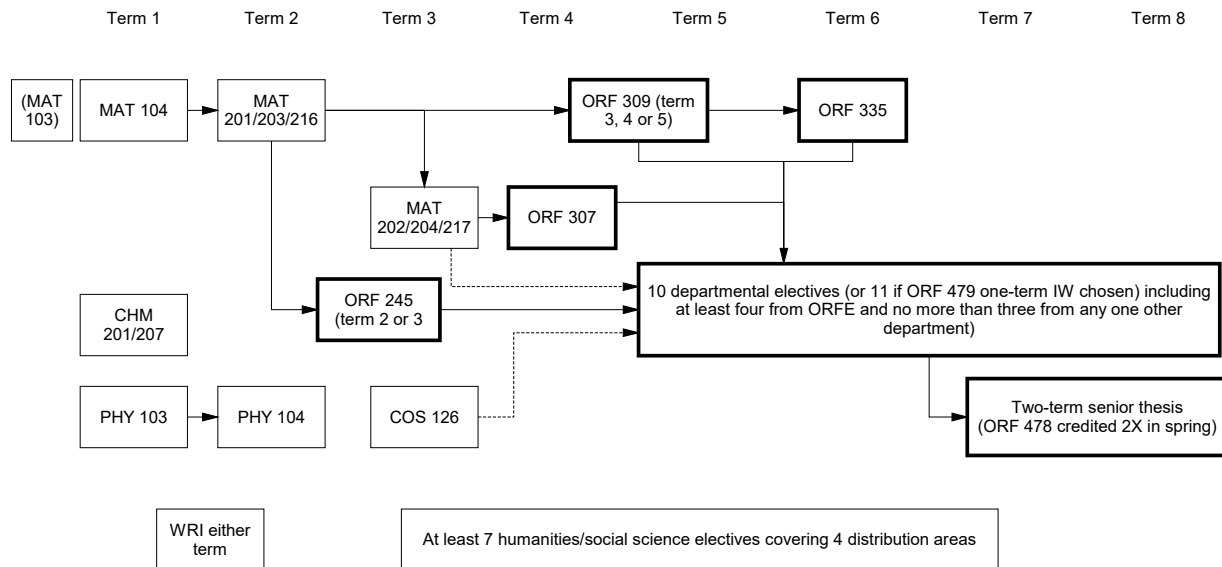


Mechanical and Aerospace Engineering

Students in MAE may choose to pursue either the Aerospace Engineering or Mechanical Engineering tracks or they may pursue both. For detailed information, please consult the MAE undergraduate handbook.



Operations Research and Financial Engineering



Certificate programs/minors and interdisciplinary work

Many B.S.E. students find that certificate programs and minors provide opportunities to explore interests outside their majors. Many certificate programs are now being renamed minors, and new minors are being created. Almost all non-engineering minors and certificates are also open to B.S.E. students. You may find that even without doing a minor or certificate program you will have opportunities to take courses outside your major for breadth in another engineering field. Finally, it may be possible to do independent work that spans different departments and for it to be advised jointly by faculty members from each one. For example, Electrical and Computer Engineering majors have done independent work with faculty in Neuroscience.

Changing majors

Some students have second thoughts over the summer and decide that they prefer to major in a different engineering department. At the start of the fall term, changing is simple. It involves getting a form from the Undergraduate Affairs Office (Ms. Traci Miller) and following the steps on it. As sophomore year goes on, it is more difficult, and some changes are easier than others (e.g. from ORFE to COS), but it is often possible to work out changes by the beginning of the spring term of sophomore year or even later.

Planning for Studying Abroad

The spring of your first year is a good time to start planning for studying abroad. The usual time to study abroad is the spring of junior year (except for CBE, when it's spring of sophomore year) but other terms may be possible. Early planning is key. First, think about where you might want to study. Princeton has exchanges with several top engineering programs abroad, but more destinations are available outside exchanges. Visit the Study Abroad Program in the Simpson International Building and look at student reviews of destinations. Attend information sessions on Study Abroad for B.S.E. students that take place every semester, as well as information sessions on specific programs.

Dean Bogucki is always happy to discuss studying abroad and how it works with different majors. Please go away!

8. Useful Contacts

SEAS Directors of Undergraduate Studies

If you have specific questions about a department, don't hesitate to contact the appropriate director of undergraduate studies. For 2023-24, the directors of undergraduate studies are:

Chemical and Biological Engineering

| | | | |
|-------------------|------|----------|-----------------------|
| Prof. José Avalos | 9881 | 101 Hoyt | javalos@princeton.edu |
|-------------------|------|----------|-----------------------|

Civil and Environmental Engineering

| | | | |
|---------------------------|------|-------------|------------------------|
| Prof. Sigrid Adriaenssens | 4661 | E332 E-Quad | sadriaen@princeton.edu |
|---------------------------|------|-------------|------------------------|

Computer Science

| | | | |
|-----------------------|------|-----------------|----------------------|
| Prof. Brian Kernighan | 2089 | 311 CS Building | bwk@cs.princeton.edu |
|-----------------------|------|-----------------|----------------------|

(Prof. Kernighan is the departmental rep for COS pre-majors, non-majors, and study abroad.)

Electrical and Computer Engineering

| | | | |
|-----------------------------|------|-------------|-------------------------|
| Prof. Gerard Wysocki (fall) | 8187 | B324 E-Quad | gwyssocki@princeton.edu |
|-----------------------------|------|-------------|-------------------------|

Mechanical and Aerospace Engineering

| | | | |
|-----------------------|------|--------------|------------------------|
| Prof. Michael Littman | 5198 | D202A E-Quad | mlittman@princeton.edu |
|-----------------------|------|--------------|------------------------|

Operations Research and Financial Engineering

| | | | |
|------------------------|------|--------------|----------------------|
| Prof. Alain Kornhauser | 4657 | 229 Sherrerd | alaink@princeton.edu |
|------------------------|------|--------------|----------------------|

Certificate Program/Minor Directors

Besides the six SEAS departments, there are a number of interdisciplinary certificate programs and minors⁵ which may be of interest to B.S.E. students. Advisees with questions about these minors and programs should contact the directors listed below.

Computer Science minor

| | | | |
|-----------------|------|------------|---------------------|
| Dr. Kevin Wayne | 4455 | 040 Corwin | wayne@princeton.edu |
|-----------------|------|------------|---------------------|

Applied and Computational Mathematics certificate

| | | | |
|------------------------|------|----------|--------------------|
| Prof. Ramon van Handel | 0973 | 207 Fine | rvan@princeton.edu |
|------------------------|------|----------|--------------------|

Architecture and Engineering certificate

| | | | |
|-----------------------|------|------------------|------------------------|
| Prof. Maria Garlock | 2728 | E307 E-Quad | mgarlock@princeton.edu |
| Prof. Forrest Meggers | 7831 | S03 Architecture | fmeggers@princeton.edu |

⁵ Most certificates will eventually be recast as minors.

| | | | |
|--|------|----------------------|--|
| Bioengineering minor | | | |
| Prof. Jared Toettcher | 8466 | 140 Thomas Lab | toettcher@princeton.edu |
| Engineering Physics minor | | | |
| Prof. Waseem Bakr | 4494 | 234 Jadwin Hall | wbakr@princeton.edu |
| Geological Engineering certificate | | | |
| Prof. Catherine Peters | 5645 | E417A E-Quad | cap@princeton.edu |
| Materials Science & Engineering minor | | | |
| Prof. Alejandro Rodriguez | 8962 | B318 E-Quad | arod@princeton.edu |
| Optimization and Quantitative Decision Science certificate | | | |
| Prof. Amir Ali Ahmadi | 6416 | 329 Sherrerd | aaa@princeton.edu |
| Robotics and Intelligent Systems minor | | | |
| Prof. Szymon Rusinkiewicz | 7479 | 222 Computer Science | smr@princeton.edu |
| Statistics and Machine Learning minor | | | |
| Professor Peter Ramadge | 4645 | B222 E-Quad | ramadge@princeton.edu |
| Sustainable Energy certificate | | | |
| Prof. Egemen Kolemen | 9209 | D302D E-Quad | ekolemen@princeton.edu |
| Technology and Society certificate | | | |
| <i>Interested students should first consult:</i> | | | |
| Dr. Victoria Dorman | 8676 | ACE-24 E-Quad | vdorman@princeton.edu |
| Also of interest to B.S.E. students: | | | |
| Environmental Studies minor | | | |
| Contact Ms. Amber Lee | 4998 | 127 Guyot | amberlee@princeton.edu |
| Language and Culture minors and certificates | | | |
| Consult director of undergraduate studies in appropriate language department | | | |
| Teacher Preparation certificate | | | |
| Dr. Todd Kent | 3336 | 41 William Street | twkent@princeton.edu |

Other Important Offices and People

SEAS Undergraduate Affairs Office

| | | | |
|--------------------|---------------|------|-----------------------|
| Dean Peter Bogucki | C-207, E-Quad | 4554 | bogucki@princeton.edu |
| Ms. Traci Miller | C-209, E-Quad | 4554 | traci@princeton.edu |

The SEAS Undergraduate Affairs Office is your main point of contact for all your matters regarding the undergraduate program of study in engineering. Send general questions to BSEprogram@princeton.edu.

Residential Colleges

BUTLER COLLEGE:

| | | | |
|-----------------|----------------------|------|------------------------|
| Dean: | Dr. Rashidah Andrews | 4954 | rashidah@princeton.edu |
| Assistant Dean: | Dr. Matthew Lazen | 7140 | mlazen@princeton.edu |

FORBES COLLEGE:

| | | | |
|-----------------|---------------------|------|-----------------------|
| Dean: | Dr. Patrick Caddeau | 5229 | caddeau@princeton.edu |
| Assistant Dean: | Dr. Fang Du | 7193 | fangdu@princeton.edu |

MATHEY COLLEGE:

| | | | |
|-----------------|-----------------------------|------|------------------------|
| Dean: | Dr. Michael Olin | 3317 | molin@princeton.edu |
| Assistant Dean: | Dr. Natalia Córdova-Sánchez | 7223 | ncordova@princeton.edu |

NEW COLLEGE WEST:

| | | | |
|-----------------|--------------------------|------|------------------------|
| Dean: | Dr. Johanna Rossi Wagner | 1929 | jrwagner@princeton.edu |
| Assistant Dean: | Dr. Xin Liu | 3629 | xl5774@princeton.edu |

ROCKEFELLER COLLEGE:

| | | | |
|-----------------|--------------------------|------|------------------------|
| Dean: | Dr. Justine Levine | 7245 | justinel@princeton.edu |
| Assistant Dean: | Dr. Nicholas Tippenhauer | 5313 | nrt@princeton.edu |

WHITMAN COLLEGE

| | | | |
|----------------|--------------------|------|---------------------------|
| Dean: | Dr. Jaclyn Schwalm | 8525 | jschwalm@princeton.edu |
| Assistant Dean | Dr. Matthew Newman | 8093 | matt.newman@princeton.edu |

YEH COLLEGE

| | | | |
|----------------|-------------------|------|-----------------------|
| Dean: | Dr. Alexis Andres | 2248 | aandres@princeton.edu |
| Assistant Dean | Dr. Junhow Wei | 2257 | junhow@princeton.edu |

Placement Officers

| | | | | |
|------------------|-------------------------|------|---------------|------------------------|
| Chemistry | Dr. Rob L'Esperance | 1307 | A87 Frick | rpl@princeton.edu |
| Computer Science | Dr. Christopher Moretti | 5388 | 036 Corwin | cmoretti@princeton.edu |
| Mathematics | Dr. Ana Menezes | 4230 | 510 Fine Hall | amenezes@Princeton.edu |
| Physics | Dr. Katerina Visnjic | 2313 | 219 Jadwin | visnjic@princeton.edu |

Other Important People and Offices

Academic-Athletic Advising

Dean Alec Dun 9310 408 Morrison jamesdun@princeton.edu

Health Professions Advising

Ms. Kate Fukawa-Connelly 0900 233 36 Univ. Pl. hpa@princeton.edu

Study Abroad Program

Dr. Gisella Gisolo 1010 A55A Simpson ggisolo@princeton.edu

Counseling and Psychological Services (CPS)

McCosh Health Center 3141 McCosh Health Center, 3rd floor

Princeton Writing Program

Dr. Amanda Irwin Wilkins 2703 205 New South awilkins@princeton.edu
writing@princeton.edu

Director of Davis International Center for international student matters

Mr. Albert Rivera 9403 A53 Simpson Bldg. intlctr@princeton.edu

Career Advising for Engineering Students

Mr. David Belson 8755 209 36 Univ. Place db1114@princeton.edu
Mr. Ryan Herbert *19 9577 220 36 Univ. Place ryanph@princeton.edu

9. How do I ...?

In this section, many of the most common questions asked by first-year B.S.E. students are answered.

... choose my courses?

After becoming familiar with the requirements for your program of study from all the information you have received (including this *Guide*) you should go online through TigerHub and prepare your Academic Planning Form. Then meet with your adviser, who will approve your course selections.

... change a course?

Dropping and adding a course is done through TigerHub after consultation with your adviser during the first two weeks of classes. After that, you may drop a fifth course (for a fee) until the end of the ninth week of classes. You normally can't add a course after the second week of classes. Dropping a fourth course should be done only for extreme damage control and must be discussed with Dean Bogucki.

... get an extension?

See your residential college assistant dean before Dean's Date. Extensions are given only for work that is due on Dean's Date, not work that should have been completed earlier in the semester.

... study abroad?

Start planning early. Attend the Study Abroad for B.S.E. Students information sessions offered at the start of the Fall and Spring terms. Determine which term works best for your intended major and possible destinations. Visit the Study Abroad office in the Simpson Building and meet with the counselor responsible for the place you want to go. Read reviews by students who have been abroad. Dean Bogucki is always happy to talk about studying abroad. Eventually, you need approval for your program of study from your department as part of the application process. A 3.0 GPA in the academic year prior to departure is required for studying abroad.

... choose my major?

During your first year in the B.S.E. program, you will familiarize yourself with the six engineering departments by attending the Explore Engineering majors fair in the fall, all sorts of departmental programs, visiting the departments' websites and looking at their undergraduate handbooks, and eventually attending the Departmental Open Houses in spring. You will then meet with a faculty adviser in your intended department (not your first-year adviser) and choose courses for the fall.

... declare my major?

In late April, you will receive an e-mail from the Registrar asking you to confirm your choice of major by selecting it from a drop-down menu.

... change my major (sophomores, within B.S.E.)?

Inform yourself about the program in your new intended major by reading the undergraduate guide at the department's website. Note requirements you have missed and devise a plan to make up. Pick up

a sophomore-change-of-department from the SEAS Undergraduate Affairs Office, C-209 Engineering Quad. Follow the steps on the form and meet with the director of undergraduate studies of the department you wish to join. Return the form to us and the change will be made with the Registrar and your college.

... change my degree (B.S.E. to A.B., A.B. to B.S.E.)?

You need to see Dean Bogucki for a conversation. If you wish to switch to B.S.E., discuss how you plan to fulfill the general engineering requirements. If you wish to switch to AB, have a good reason.

... find my adviser?

Ideally you remember your adviser's last name, and you can go to the Princeton University Homepage and search on it. Along with contact information, your adviser's office address will be listed. If you are lost, please stop by the Undergraduate Affairs Office in C-209 E-Quad and we will direct you.

... find my interactor???

You can also find contact information for your interactor by searching the Princeton directory on the homepage. If in doubt, please contact the Undergraduate Affairs Office, and we will direct you.

... change sections within a course?

Normally, this should be something that you can handle within the course itself. Large courses will have a teaching assistant who serves as course administrator and that is the person with whom to speak. In Math, you will have to visit the Math Undergraduate Office in Fine Hall to arrange to switch sections. If in doubt, ask the instructor.

... change a course to PDF?

Check *Course Offerings* whether the course is allowed to be taken PDF. You can make a change in TigerHub between the beginning of the seventh week and the end of the ninth week of classes. B.S.E. students may take up to four courses out of the 36 on a PDF basis. Only one course can be elected PDF in any given term. Courses that are offered PDF-only do not count against these limits. **Remember that B.S.E. general math-physics-chemistry-computing requirements may not be taken on a PDF basis.**

... find out about certificate programs/minors?

All certificates and minors have websites. Here is a good link: <https://advising.princeton.edu/degree-planning/minors-certificates> and follow links. Choosing a major takes priority over certificates. Don't worry too much about minors or certificates right now.

... get premed advice?

Get your premed advice exclusively from the Health Professions Advising Office, 36 University Place, Suite 230. Contact them at hpa@princeton.edu or visit <https://hpa.princeton.edu/>.

... get career advice?

It's not too early to become familiar with the Center for Career Development. Visit their website at <https://careerdevelopment.princeton.edu/>. Make an appointment for individual career advising with Mr. David Belson or Mr. Ryan Herbert *19 by visiting <https://princeton.joinhandshake.com>. Attend the Science and Technology Job Fair in the fall and other events through the year.

... take Advanced Standing?

Make sure you're eligible. For a year of Advanced Standing, you need 8 units of AP credit, including 2 in physics (exemption from 103-104 by departmental test), placement out of Math 103-104 (by completion of Math 201), and 1 in chemistry. For a semester of Advanced Standing, you need 4 units of AP credit, including 2 in physics, 1 in math, and 1 in chemistry. If you don't have AP in physics, math, or chemistry, you're not eligible as a B.S.E. student. If you are interested in a full year of Advanced Standing, then you need to take a sophomore program of study from the beginning; otherwise Advanced Standing isn't feasible. See Chapter 7 above for the right 200-level departmental courses. In November, a letter from your college's assistant dean for studies will inform you of eligibility. Discuss with your advisers, Dean Bogucki, and your assistant dean whether Advanced Standing is for you. If you're not interested in spending fewer than 4 years at Princeton, you don't have to do anything. If you are, an application originates with your assistant dean for studies. If you take Advanced Standing and find things are moving too fast, you can revert to your original class.

... take a summer course?

B.S.E. students may take up to four pre-approved summer courses at other four-year accredited institutions. See <https://engineering.princeton.edu/undergraduate-studies/sophomore-senior-advising/summer-course-information> for information on current policies and procedures. The deadline for preapproval is Dean's Date of the spring term.

... find a summer job?

Start early, by December or January. All experience is useful. Earning money is good. Are there family members or friends who can employ you? Talk with faculty members about summer research. Watch e-mail from Dean Bogucki. Explore the National Science Foundation's Research Experiences for Undergraduates (REU) program. Attend the Science and Technology Job Fair and events run by Career Development. Search the HandShake system (<https://careerdevelopment.princeton.edu/internships-jobs/handshake>). Investigate the International Internship Program. Be alert and resourceful!

... take a leave of absence (don't call it a "gap year"!)?

If you want to take a break in your Princeton education and you are in good academic standing, that's known as "taking a leave of absence." A "gap year" is between high school and college. Please don't say "I want to take a gap year." You should discuss your reasons and plans for taking a leave of absence with your college dean. Have a plan for what you'll do while you're away to make the most of the opportunity. When you return, you usually pick up where you left off. For example, if you take a leave of absence after finishing the fall term, then you'll come back for the next available spring term.

... get academic help?

Talk with your instructor. Go to office hours! If you did poorly on a test, bring it to discuss. If office hours seem intimidating, go with a friend in the course. If the course has teaching assistants, meet with them, too. Look into services offered by the McGraw Center for Teaching and Learning like study halls (group tutoring) and learning consultations to get more from your courses. The Writing Center offers help with papers. Talk with your college's assistant dean about whether individual tutoring is appropriate. But always start with the course instructors!

... find my instructors' office hours?

These should be listed on the syllabus or on the instructors' own websites. Posted office hours are not the only times an instructor is available. If you have a conflict with the scheduled office hours, speak with the instructor after class and usually another time to meet can be easily found.

... drop a course?

Why? Discuss with your adviser. Are you having difficulty? What have you done to succeed in the course? Talk with your instructor. Often you'll find you're doing better than you thought. Is it a course you need for your degree (e.g. Physics 103)? In that case, see Dean Bogucki. If it's a fifth course, and you don't need it to stay on track for the B.S.E. degree, then you can drop it in TigerHub. If it's a fourth course, that's a problem. See Dean Bogucki.

... get a transcript?

Your transcript is the official documentation of your Princeton academic record. You can request your official transcript from the Registrar at <https://registrar.princeton.edu/student-and-alumni-services>.

... obtain accommodation for a disability?

See the Office of Disability Services after reviewing their website: <https://ods.princeton.edu/>.

... change my name or home address?

See if you can do it in TigerHub (<https://registrar.princeton.edu/tigerhub>) or visit the Registrar's Office.

... review my Degree Progress?

"Degree Progress" in TigerHub enables you to see how you are fulfilling requirements toward graduation. You're responsible for making sure you're on track. Check your degree progress every semester and after you change courses. Notify Dean Bogucki if anything isn't calculating correctly.

... get verification of enrollment?

You may need a document verifying your enrollment at Princeton for a job or scholarship application. The Registrar's Office provides verification of enrollment free of charge. Visit <https://registrar.princeton.edu/student-and-alumni-services>, click on "Transcript and enrollment verification".

...get a letter of recommendation?

Do you know a Princeton faculty member or administrator? They are often asked to write recommendations and with advance notice, they usually do not mind doing it. Tell them what you're applying for and why it interests you. Provide the name and address to whom they should write. You know at least one Princeton faculty member: your academic adviser. So get to know your adviser!

... find Dean Bogucki?

Dean Bogucki's office is in room C-207 of the Engineering Quad, next to the E-Quad Café.

... find Traci Miller?

Ms. Miller's office is right next to Dean Bogucki's, C-209 of the Engineering Quad.

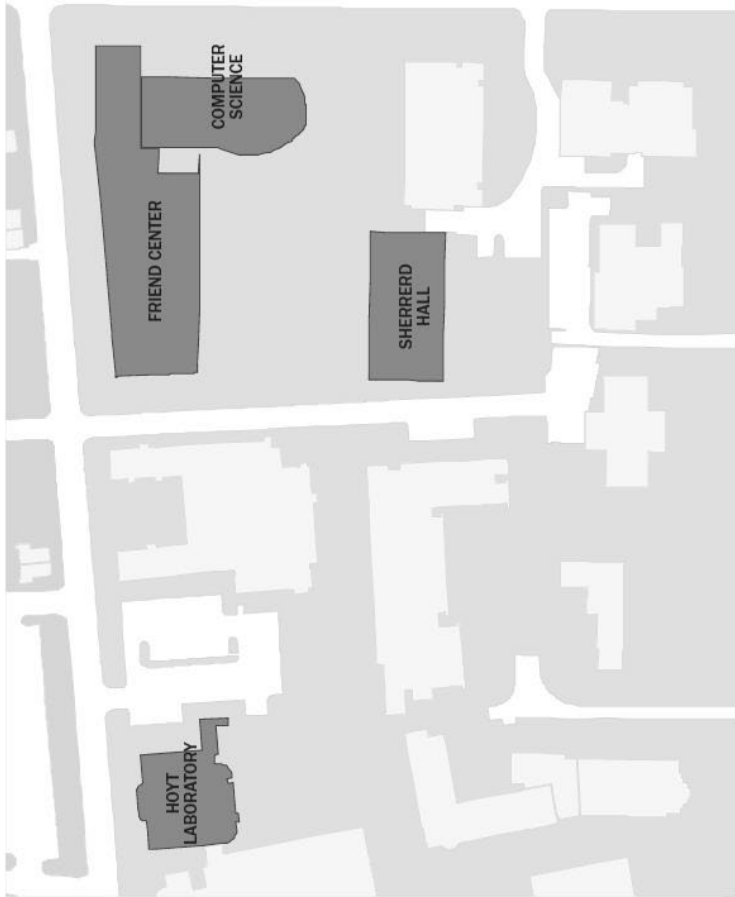
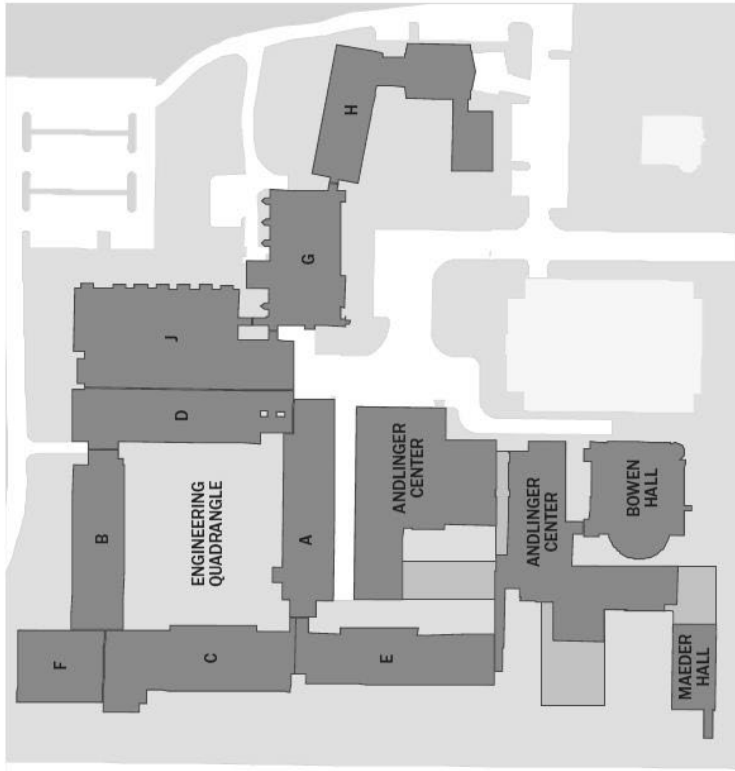
... see Dean Bogucki?

Please send Traci Miller e-mail at BSEprogram@princeton.edu to make an appointment. Please don't e-mail Dean Bogucki directly to ask when is a good time, since he will just forward your e-mail to Ms. Miller to make an appointment.

... say Dean Bogucki's name?

Dean Bogucki's grandparents were born in Poland, and he uses the Polish pronunciation of his name. Try saying *Bow-good-ski* (accent on the *good*) or if you want to get a little closer to the right sound, you can try *Boh-goot-zki*. Pro-tip: "Bogucki" does not rhyme with "Kentucky"!

If your question is not answered here, please contact the SEAS Undergraduate Affairs Office at BSEprogram@princeton.edu. Dean Bogucki or Traci Miller have years of experience at Princeton and can direct you to the proper person or office.



| Department / Center | Main Office | Department / Center | Main Office | Department / Center | Main Office |
|---|----------------------|------------------------------|-------------------|---|----------------------|
| Chemical & Biological Engineering | A217 E-Quad | Dean's Office | C232 E-Quad | Andlinger Center | 113 Andlinger Center |
| Civil & Environmental Engineering | E209 E-Quad | Graduate Affairs Office | C211 E-Quad | Center for Information Technology Policy | 303 Sherrerd Hall |
| Computer Science | 220 Computer Science | Undergraduate Office / Tours | C205 E-Quad | Princeton Institute for the Science & Technology of Materials | 321 Bowen Hall |
| Electrical Engineering | B210 E-Quad | Library | Friend Center | | |
| Mechanical & Aerospace Engineering | D212 E-Quad | Convocation Room | 113 Friend Center | | |
| Operations Research & Financial Engineering | 105 Sherrerd Hall | Keller Center | ACE21 E-Quad | | |

