

Introductory Sciences at The Department of Natural Sciences

An Informal Advising/Orientation Guide

2024-2025

If you are considering becoming a science or pre-health major, please talk with a Natural Sciences faculty member before enrolling in your first-semester courses. Science faculty can help ensure that you are enrolled in classes appropriate to your previous experience and can assist with the advanced planning that is often necessary to navigate through the prerequisites required for many upper-division courses.

For the majors listed below, these faculty indicated are available for consultation:

- Biology— Professor Patrick Ferree (pferree@scrippscollege.edu)
- Chemistry— Professor Anna Wenzel (awenzel@scrippscollege.edu)
- Environment, Economics, Politics – Professor Diane Thomson (dthomson@scrippscollege.edu)
- Physics— Professor Adam Landsberg (alandsberg@scrippscollege.edu)
- Biochemistry— Professor Aaron Leconte (aleconte@scrippscollege.edu)
- Biophysics— Professor Adam Landsberg (alandsberg@scrippscollege.edu)
- Environmental Analysis— Professor Colin Robins (crobins@scrippscollege.edu)
- Human Biology— Professor Sarah Budischak (sbudischak@scrippscollege.edu)
- Management-Engineering— Professor Kevin Setter (ksetter@scrippscollege.edu)
- Molecular Biology— Professors Findley Finseth (ffinseth@scrippscollege.edu) (Fall); Pete Chandrangsu (pchandrangsu@scrippscollege.edu) (Spring)
- Neuroscience— Professor Jenna Monroy (jmonroy@scrippscollege.edu)
- Organismal Biology— Professor Sarah Gilman (sgilman@scrippscollege.edu)
- Science Management— Professor Anna Wenzel (awenzel@scrippscollege.edu)

Pre-Health

The *minimal* science requirements for students planning careers in the health professions include: “Basic Principles of Chemistry” (014L and 015L), “Organic Chemistry” (116L and 117L), “Introductory Biology” (043L and 044L), and “General Physics for the Life Sciences” (030L and 031L) or “Principles of Physics” (033L and 034L). Please see the Natural Sciences Pre-Health website (<https://www.kecksci.claremont.edu/student-resources/pre-health-advising/>) for additional information on required and recommended courses for pre-health students. Susie Fang, the department’s Director of Pre-Health Advising, may also be reached at sfang@scrippscollege.edu.

Below is some informal course-specific advice we provide to help determine your first year of courses.

Chemistry

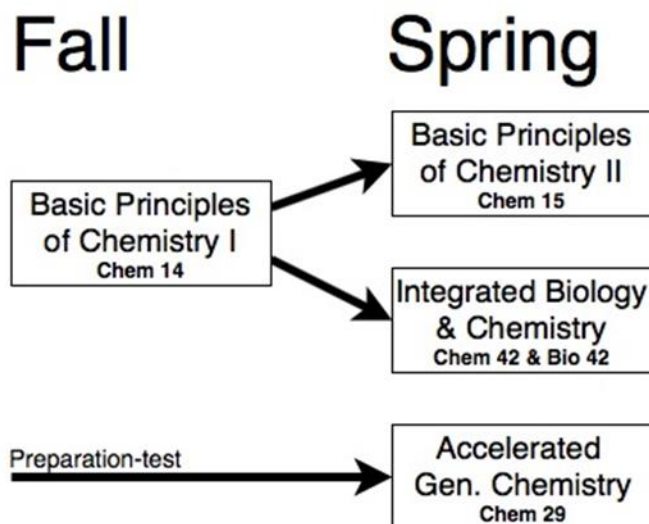
We generally advise potential Chemistry, Biology and pre-health-intended majors to take introductory Chemistry the first year. This allows them to take organic chemistry the following year if needed, which frees up the possibility of studying abroad during the junior year. There are several paths to taking introductory Chemistry at The Natural Sciences Department (see Figure 1).

The traditional path is Chem 014 in the Fall and Chem 015 in the Spring. These courses are to be taken in order, and each semester there are multiple lectures/professors with associated weekly laboratory sessions. For those with weaker mathematics preparation there is a section of Chem 014 with additional time dedicated to problem-solving, please contact Professor Amy Babbes (ababbes@scrippscollege.edu) for more details on this section.

An interdisciplinary path is to take Chem 014 in the Fall, and Chem/Bio 042 in the Spring. Chem/Bio 042 is an Integrated Biology and Chemistry course that is co-taught by Biology and Chemistry professors. It is not an accelerated course - it has largely the same content as the second semester of introductory chemistry (Chem 015), and of introduction to biology (Bio 043), but is taught with an additional emphasis on interdisciplinary connections. There is only one section of it offered this Spring, and entry is via regular pre-registration in the late-Fall (there is no admission-test, and the only prerequisite is Chem 014). For those deciding whether to take Bio 043 in the Fall vs. Integrated Biology and Chemistry in the Spring, please email Professor Erin Jones (ejones@scrippscollege.edu).

CHEM 029, *Accelerated General Chemistry*, provides an alternative to the mainline version of general chemistry, *Basic Principles of Chemistry (CHEM 014 and CHEM 015)*. CHEM 029 is taught ONLY in the spring semester and requires the CHEM 029 placement diagnostic and permission of the instructor to enroll. While there are no additional formal requirements, students who place into CHEM 029 generally have two (2) years of high school chemistry preparation.

The CHEM 029 placement diagnostic will be available **starting on August 14, 2024**, and will continue to be available until the class is filled. Students will need to register for the placement exam by emailing Professor Anna Wenzel (awenzel@scrippscollege.edu). Professor Wenzel will provide further instructions for taking the online placement diagnostic. Following completion of the placement diagnostic, Professor Wenzel will email each student about placement in CHEM 029 or CHEM 014 within 72 hours and will be available for consultation with the student and/or their academic advisor.



Biology

Biology majors or any student wishing to take upper division courses in biology are generally advised to complete the two course Introductory Biology series (Bio 043 and Bio 044) by the end of their second year. These courses serve as prerequisites for all upper division biology courses. The courses may be taken in either order, but Bio 043 is usually offered only in the Fall and Bio 044 usually only in the Spring. Note that a Bio 043 equivalent may be taken in the Spring through the Integrated Biological Chemistry (IBC) double course. Both Bio 043 and Bio 044 have a laboratory component that meets once each week for four hours.

There are several options for taking the introductory biology series. If a student has taken some Chemistry and Calculus in high school, then taking Bio 043 in the first semester (along with Chem 014) is a possibility. A popular option is to take Bio 044 in the second semester (Spring), and Bio 043 in the third semester (Fall semester of the second year). A student who wishes to have an integrated Biology-Chemistry experience may take IBC in Spring semester of their first year and Bio 044 in Spring semester of their second year. All of these options will allow a student to stay on track with their upper division coursework.

For students wishing to major in biology, it is strongly advised that they complete the introductory chemistry series in their first year. This means enrolling in Chem 014 in fall and Chem 015 (or IBC) in the spring of the first year.

Neuroscience

The neuroscience major requires both semesters of Intro Bio and Intro Chem, which should be taken during the first and second year. Foundations of Neuroscience (NEUR 095) is only offered in the Spring and should be taken during the first or second year. It is not advised that Foundations be taken at the same time as two other science courses as that requires taking 3 labs in one semester. It is highly recommended that students take Foundations prior to Neuro 1 or Neuro 2. The material covered in Neuro 1 and Neuro 2 are quite integrative and can be a little overwhelming for students with less science background.

Students decide on a 'sequence'; a set of 4 courses in a particular area. These are listed on the neuroscience website (<https://www.pitzer.edu/academics/field-groups/neuroscience/>).

For example, students interested in psychology-based neuroscience will take 4 psychology-related courses. The courses in the second ‘tier’ are based on the sequence. Students taking psychology-based courses should take Research Methods and Psych Stats (these usually have to be taken at their home institution), along with math or CS. The non-psychology students should take some combination of biostats, computer science, math, or physics (only one semester of physics counts).

Physics/Biophysics/Engineering

Students contemplating a *Physics major* should take Principles of Physics (Physics 033) in the Fall semester of their first year, followed by Physics 034 in the Spring. Waiting until sophomore year before taking intro physics is strongly discouraged, since it can produce a variety of scheduling challenges later (including with study abroad). Potential physics majors should also plan on finishing *at least* through second-semester college calculus by the end of their first year. (Math 031S at Pomona has a focus on *applied* calculus and might be an especially good choice for science majors who need second-semester calculus.)

Students contemplating a *Biophysics major* have the option of taking either the Principles of Physics (Physics 033-034) intro sequence or the General Physics for Life Science (Physics 030-031) intro sequence (see below), though we recommend starting with Physics 033. Ideally, biophysics majors should take intro physics starting in the fall semester of their first year, though it is possible for biophysics majors to wait until sophomore year.

Students with a potential interest in physics or biophysics should *always consult with a physics professor before making their course selections*; students with a definitive plan to major in physics or biophysics should switch to a physics professor as their academic advisor.

Students contemplating participating in our *Engineering program* should *immediately* consult with Professor Kevin Setter, ksetter@scrippscollege.edu.

The physics program has two distinct intro physics course sequences: Principles of Physics (Physics 033-034) and General Physics for the Life Sciences (Physics 030-031). Physics, Chemistry, and Engineering majors should take Physics 033-034, while life science majors often take the Physics 030-031 intro sequence; biophysics majors can do either sequence, though 033-034 is preferred. Although the two intro sequences are similar, the key differences are: (a) 033-034 is frequently taught in an integrated lecture-lab format, whereas 030-031 has separate lectures and labs; (b) while both sequences use calculus, 033-034 uses it more heavily; (c) 030-031 has more life science related examples; (d) 033-034 uses numerical software packages more; (e) 034 covers electromagnetism and waves, while 031 covers electromagnetism, waves, and some modern physics.

Environmental Analysis Science Track

The environmental analysis *science track* major requires a semester of Intro Bio (BIOL 044LKS) and Intro Chem (CHEM 014LKS), or equivalent, which should be taken during the first and second year. Majors must also take an introductory earth science course (e.g., EA 055LKS, GEOL 020 PO, or approved alternate). One core course, Introduction to Environmental Studies (EA 010PZ or PO) and either Nature, Culture and Society (EA 020PO) or Environmental Justice (EA 086PZ), or POLI 136PO, are not generally prerequisites for other courses, but are required for the major and are recommended to be taken within the first two years. Please check the

course catalog for further major requirements or make sure you consult with an EA-affiliated Natural Sciences faculty member.