

# STEM Advising Support for First Year Students (Fall 2021)

With fall 2021 registration approaching for first year students, chairs of STEM and STEM-associated departments and programs have offered their advice for students who are interested in these areas and may be considering pursuing a major therein.

Below you will find the chairs' advice and contact information if you have further questions.

## Biology

(Chair: Larissa Williams, [lwillia2@bates.edu](mailto:lwillia2@bates.edu)):

- **First-year** life science students of any kind (interested in pre-health, bio, neuro, biochem, or ES) should take BIO 195 either in the fall of 2021 or in the winter of 2022.
- **First-year** students interested in pre-health, bio, neuro, or biochem should take CHEM 107 in the fall of 2021 and CHEM 108 in the winter.
- Early-stage bio-interested students might also consider a 100-level elective - not necessary, but a way to explore biology further. We will offer one section of BIEA113 (Marine Science) in the fall of 2021 and one in the winter of 2022.

## Chemistry and Biochemistry

(Chair: Matt Côté: [mcote@bates.edu](mailto:mcote@bates.edu))

- Students considering majoring in chemistry or biochemistry typically complete CHEM 107 (fall), CHEM 108 (winter), CHEM 217 (fall), CHEM 218 (winter) by the end of their sophomore year.
- CHEM 212 or 215 are sometimes taken by sophomores but students can hold off until junior year.

## Digital and Computational Studies

(Chair: Barry Lawson: [blawson@bates.edu](mailto:blawson@bates.edu))

If you want to learn the fundamentals of computer science theory and programming, we recommend DCS 109: Introduction to Computing and Programming.

If you are interested in exploring what DCS is as a program in terms of blending critical digital studies with some programming and digital tools, you should consider a course like [DCS 105: Calling Bull in a Digital World](#). This course will be offered in Winter 2022.

Courses for Fall 2021 include:

- DCS 109: *Introduction to Computing & Programming*. Open to everyone.
- DCS 204: *Data Cultures*. Open to all class years. Prerequisite: one 100-level DCS course.
- DCS 210: *Programming for Data Analysis and Visualization*. Prerequisite: one DCS course, or permission of the instructor.
- DCNS 240: *Neural Networks*. Open to everyone
- DCS 229: *Data Structures & Algorithms*. Prerequisite: DCS 109 (or similar introductory computer science and programming background -- contact Prof. Barry Lawson if you have questions).
- DCHI 301C: *Public Digital History*. Open to everyone.
- DCS 304: *Community Organizing for a Digital World*. Community Engaged Learning critical digital studies course. Open to everyone.

## Earth and Climate Sciences (formerly Geology)

(Chair: Bev Johnson, [bjohnso3@bates.edu](mailto:bjohnso3@bates.edu))

See [Major Requirements](#) for different class years.

### **What courses of interest to first- and second-year students (i.e. undeclared students) are being offered?**

If a student is interested in exploring the field for the first time, they should join any of the EACS 100-levels (such as EACS 104, 103, 107, 109) or EA/PH 119 or BI/EA 113.

If students have had a 100-level EACS course, they should begin to take the 200-level courses (EACS 210, EACS 223, EACS 230, EACS 240, or EA/PH 220). Four out of five of these 200-level courses are required for the major. Additionally, students in the class of 2024 or beyond can take a second 100-level (see detailed [EACS Major Requirements](#)).

### **Fall, 2021**

*EACS 104: Plate Tectonics and Hazards*

*BI/EA 113: Marine Science*

*EACS 230: Earth Structure and Dynamics*

*EACS 240: Environmental Geochemistry*

*Additional courses currently under development and to be added to fall grid:*

*EACS 1xx: Introductory course in geology*

*EACS 2xx/3xx: Upper level course in Earth Surface Process*

*EACS 3xx: Upper level course in Earth Materials (currently under development)*

### **Winter, 2022**

*EACS 103: Earth Surface Environments and Environmental Change*

*EACS 109: Earth's Climate System*

*EACS 210: Sedimentary Processes and Environment/Lab*

*EACS 223: Earth Materials*

*EA/PH 220: Dynamical Climate*

*EACS 310: Glacial Geology*

*Additional course under development and to be added to winter grid:*

*EACS 2xx/3xx: Upper level course in Geology*

## **Environmental Studies**

(Chair: Joe Hall, [jhall2@bates.edu](mailto:jhall2@bates.edu))

### **What courses of interest to first- and second-year students (i.e. undeclared students) are being offered?**

ENVR 203: Scientific Approaches to Environmental Issues (winter 2022, no prerequisites)

ENVR 204: Environment and Society (fall 2021, winter 2022, no prerequisites)

ENVR 205: Lives in Place (fall 2021, winter 2022, no prerequisites)

ENVR 240: Water and Watersheds (fall 2021, for sophomores with experience in Excel who have taken an introductory natural science lab course)

Introductory science and math courses such as CHEM 108, PHYS 107, BIO 195, EACS 103, MATH 106, and the 200-level courses with environmental themes that build from those courses are all appropriate for students interested in environmental science.

Students interested in environmental science, in particular, should look to the Ecology and Earth Systems concentration within ES.

### **What should an undeclared sophomore thinking about your major know in order to be making satisfactory progress toward the major?**

From the College Catalog: *"It is recommended that students complete ENVR 204, 205 and either 203 or another introductory science course as early as possible, preferably within their first two years. These courses are not open to senior majors. In addition to ENVR 203, 204 and 205, the environmental studies committee recommends that all students interested in environmental studies take a related course in biology, chemistry, physics, earth and climate sciences, or environmental science during their first year."*

If there happen to be no seats remaining in the introductory core courses, students can still make progress in the major by consulting the course requirements for the concentration of their choice and registering for available electives.

Sophomores who are comfortable in Excel and have already taken the prerequisites necessary for ENVR 240, Water and Watersheds, are encouraged to enroll in that in the fall rather than waiting for ENVR 203 in the winter. If it looks full, please contact Holly Ewing ([hewing@bates.edu](mailto:hewing@bates.edu)) for either permission to enroll or advice on how to proceed.

In general, we recommend that students who are interested in an ES major contact the ES Program Chair, Joe Hall ([jhall2@bates.edu](mailto:jhall2@bates.edu)), or any of the concentration advisors. Holly Ewing ([hewing@bates.edu](mailto:hewing@bates.edu)) advises students interested in environmental science and is happy to talk with students at any stage. More information about the core, the concentrations, and the concentration advisors, can be found [here](#).

## Mathematics

(Chair: Chip Ross, [sross@bates.edu](mailto:sross@bates.edu))

**What courses of interest to first- and second-year students (i.e. undeclared students) are being offered?**

- Math 105 (Calculus I), Math 106 (Calculus II), Math 205 (Linear Algebra), and Math 206 (Multivariable Calculus) (our core courses)
- Math 221 (formerly known as math camp).

These courses are offered every semester.

**What should an undeclared sophomore thinking about your major know in order to be making satisfactory progress toward the major?** The five courses listed above should be taken in the first two years. Our major has changed recently to give more pathways to interested students (including adding a requirement of a "computational" or "applied" course and the reduction of requirements of "proof-heavy" courses). We also offer two options for senior capstone: thesis or seminar. Our major is pretty flexible and a good partner to other majors.

## Neuroscience

(Chair: Jason Castro, [jcastro@bates.edu](mailto:jcastro@bates.edu))

**What courses of interest to first- and second-year students (i.e. undeclared students) are being offered?**

- Introduction to Neuroscience (NS/PY160).
- Neuroscience, Ethics, and Society (NRSC 208) (open to first years, but has pre-reqs)

## What should an undeclared sophomore thinking about your major know in order to be making satisfactory progress toward the major?

There's a very chemistry and biology-heavy front-end to our curriculum. If BIO195 and CHEM107 & CHEM108 are not completed by the end of sophomore year it's much more difficult to find a viable path through the major.

Moreover, BIO202 and CHEM217 should also be completed by the end of sophomore year. It's still technically possible to complete the major taking BIO202 and CHEM217 junior year instead of sophomore year, but it makes completing the major difficult and the possibility of study abroad would be greatly diminished.

## Physics and Astronomy

(Chair: Travis Gould, [tgould@bates.edu](mailto:tgould@bates.edu))

### What courses of interest to first- and second-year students (i.e. undeclared students) are being offered?

[EA/PH 119. \*The Anthropocene\*](#) (general interest)

[PHYS 109. \*Energy, Matter, and Motion\*](#). This is the introductory physics course for students interested in the physical sciences. Its sequel course, [PHYS s31](#), is offered in Short Term. Offered every semester.

[PHYS 107. \*Introductory Physics of Living Systems I/Lab\*](#) Designed for students majoring in life science and/or interested in pre-health studies. Offered each **FALL**, normally taken by sophomores-seniors.

[PHYS 108. \*Introductory Physics of Living Systems II/Lab\*](#). A continuation of PHYS 107, designed for students majoring in life science and/or interested in pre-health studies, offered **WINTER**.

[PHYS 211. \*Newtonian Mechanics\*](#) (major course, typically taken as a sophomore)

[PHYS 231. \*Laboratory Physics\*](#) (major course, offered every semester)

[PHYS 216. \*Computational Physics\*](#) (major/minor elective)

[PHYS 230. \*Electronics\*](#) (major/minor elective)

[MA/PH 255E. \*Nonlinear Models and Chaos\*](#) (major/minor elective)

### What should an undeclared sophomore thinking about your major know in order to be making satisfactory progress toward the major?

They should be taking PHYS 211 in the Fall of their sophomore year, and PHYS 222 in the Winter of their sophomore year. PHYS 301 (required for the major, and a prereq for PHYS 308) is often taken in the Winter of the sophomore year. They should be aware that PHYS 308 (required for the major) is only offered in the Fall, and is typically (but not always) taken as a junior. They should be aiming to take PHYS s31 in Short Term next year.

## Engineering Combined Plan

(Advisor: Nathan Lundblad, [nlundbla@bates.edu](mailto:nlundbla@bates.edu))

Students interested in potentially pursuing the engineering combined plan (“3-2”) should consult the following web page and if necessary discuss with the engineering combined plan advisor.

<https://www.bates.edu/physics-astronomy/academics/engineering/>

Regardless of the somewhat variable prerequisite requirements of our partner institutions, students pursuing this path should be taking introductory physics ([PHYS 109](#) and [S31](#) under the new physics system in place) in their first or second year, a programming-centered DCS course in their first or second year, Chem 107 in their first or second year, and be making good progress on the Mathematics 105-106-205-206-219 sequence throughout. For further prerequisites please consult the combined plan advisor and the above website.

*Please note that need-based financial aid for the years spent at the partner institution is separately determined by that institution (e.g. Columbia), and is typically unavailable for international students.*

*Advising information gathered and arranged by:*

*Nathan Lundblad (Associate Professor of Physics and Astronomy and Natural Sciences and Mathematics Division Chair), April Hill (Wagener Family Professor of Equity and Inclusion in STEM), and Larissa Williams (Associate Professor of Biology)*