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All Gender Restroom: exit back doors, go RIGHT, through the glass door,
& down the hallway

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Alternative Format: New.Student.Orientation@Dartmouth.edu

More information: <http://dartgo.org/access>



Getting Started in Math, Engineering, and the Sciences

Some beginning advice...



DARTMOUTH

Presenter: Prof. Jon Kull

- **Department Representatives**

- Mathematics – Prof. Erik van Erp
- Biology – Prof. Lee Witters
- Earth Sciences – Prof. Leslie Sonder
- Chemistry – Prof. Mike Ragusa
- Neuroscience – Prof. Matt van der Meer
- Computer Science – Prof. Soroush Vosoughi
- Physics/Astronomy – Prof. Ryan Hickox
- Teaching Science Fellows – Prof. Lee Witters
 - Tanner Riley, '22
 - Christopher Huang, '22
 - Frankie Carr, '22
- Engineering – Prof. Petra Bonfert-Taylor and Prof. Sol Diamond



This Session

This session is designed to give you introductory information about beginning the college-level study of Math and the Sciences at Dartmouth College

Goals:

- To introduce you to the Math and Science Curricula at Dartmouth
- For you to assess high school preparation in Math and Science and to determine what that might mean for starting Math and Science course sequencing at Dartmouth
- For you to understand the best way to begin course work in individual disciplines (departments/majors)
- For you to understand the relationship between courses in different disciplines (departments/majors)



Overall info/advice

- Know where you're starting (i.e., placements in math, sciences, etc.,) and your strengths
- College courses are not the same as high school (in terms of pace, difficulty, and grade scale)
- Successful students use resources available to them!
- Your current comfort and mastery in math has implications for how you begin study in the sciences



Know where you're starting

This has implications for:

- How easy or difficult your transition to college-level science coursework will be
- What classes you take your first term
- What classes you take your first year
- Whether you take certain classes in combination
- Later flexibility for other opportunities (Foreign Study, Off term, etc.)



Is this you?

- Placement into MATH 1 (no calculus experience in High School)
- No AP courses in Math or Science
- Concern about Math/Science preparation
- Less than 700 on the SAT I Math Test



Or, is this you?

- Placement into MATH 3 (some calculus experience in High School)
- You took AP Science course in High School but did not get a 5 on the AP (or didn't take it)
- No "credit-on-entrance" in science courses on placement record



Or, is this you?

- Placement into MATH 8 or higher
- You got a 5 on one or more AP exams: Biology, Physics, Chemistry
- One or more “credit-on-entrance” in science on placement record
- Score of 22-30 on the Biology Placement/Advisory test
- Confidence/a strong background in science



Take a minute and decide

Little or no math and science background

- Placement into MATH 1 (no calculus experience in High School)
- No AP courses in Math or Science
- Concern about Math/Science preparation
- Less than 700 on the SAT I Math Test

Some math and science background

- Placement into MATH 3 (some calculus experience in High School)
- You took AP Science course in High School but did not get a 5 on the AP (or didn't take it)
- No advanced placement in science courses on placement record

A great deal of math and science background

- Placement into MATH 8 or higher
- You got a 5 on one or more AP exams: Biology, Physics, Chemistry
- One or more "credit-on-entrance" in science on placement record
- Score of 22-30 on the Biology Placement/Advisory Test
- Confidence/a strong background in science

Implications for little or no math and science background

- Avoid doubling up in the Sciences, Math, Physics, or Engineering classes in any term during your first year (there are exceptions to this, e.g. in Engineering sequences; consult with departments and your advisors)
- Two courses with labs in one term is always a heavy workload. Avoid taking two lab courses in the same term during your first year
- You will likely adjust to college level work at a pace that will allow for success in your first year
- You will have less flexibility in your D-Plan (i.e., schedule) particularly later years
- Off-campus programs (LSAs and FSPs) are possible but require careful early planning of your schedule
- You will have room for fewer electives
- If you are Pre-health, you can still complete the Pre-health curriculum before you leave Dartmouth. The norm at Dartmouth and nationwide is to take a year off between college and medical school. This enables you to plan a more flexible schedule for completing the Pre-health curriculum before you leave Dartmouth.
- You should limit your extracurricular activities during the first year (this includes internships and academic opportunities outside the classroom)

Implications for some math and science background

- Be cautious in doubling up Science, Math, or Engineering in the first term
- Avoid having your first lab course be during a term where you are taking two such courses
- Pay careful attention to your schedule as you go forward. You can do Foreign Study, etc., but it requires advance planning
- You should limit your extracurricular activities for the first year
- This allows you to apply to medical school in your final year at Dartmouth

A great deal of math and science background

- You will have more flexibility down the road (But don't squander this)
- It will be easier to fulfill a second major in addition to your science major (if you so choose)
- You should be able to fulfill the prerequisites for your science major in your first year
- It is probably fine to double up on Math and Science courses in the first term
- You may consider taking two courses with labs in the first term
- You may be taking intermediate level math/sciences courses in your first year

Some general advice (College is not the same as high school!)

- Course work will go faster than you anticipate (keep up with notes and problems; this will start in the first week).
- Schedule 3 hours of study and prep time out of class for every hour you spend in class (i.e., you will need a minimum of 30 hours a week outside of class to keep up).
- As you adjust to college work, you will need to learn how to study. This takes time.
- Don't be surprised if your first exam grade is less than 70%. This could very well be a respectable grade (depending on the curve/course etc.).
- Limit extracurricular activities. Especially until you have college academics under your belt.



Successful students use resources.

- Professors' Office Hours
- Math Department – drop-in tutorials
- Biology and Chemistry – use the Teaching Science Fellows
- Computer science - take advantage of section leaders and TAs in COSC 1 and COSC 10
- Academic Skills Center
 - 1:1 academic coaching, learning strategies online resources, E-Guide to academic success
 - Peer Tutoring Program—group tutoring for most introductory/foundational coursesVisit dartgo.org/asc for more details
- Form your own study group
- Engineering: Dartmouth Emerging Engineers (DEE). FREE study sessions five nights a week at Thayer to help with pre-requisites. Empathetic TA's, engineering faculty advising, a community of engineering students. <https://engineering.dartmouth.edu/dee/>

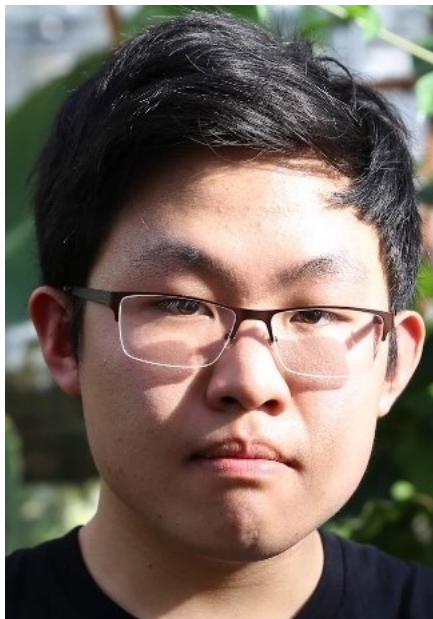
Teaching Science Fellows



Tanner Riley '22
Biology

Office: 123 Life Sciences Center

Fall term covering BIO 12 & 19
and CHEM 5, but available to any
science student



Christopher Huang '22
Chemistry

E-mail us for help/advice!

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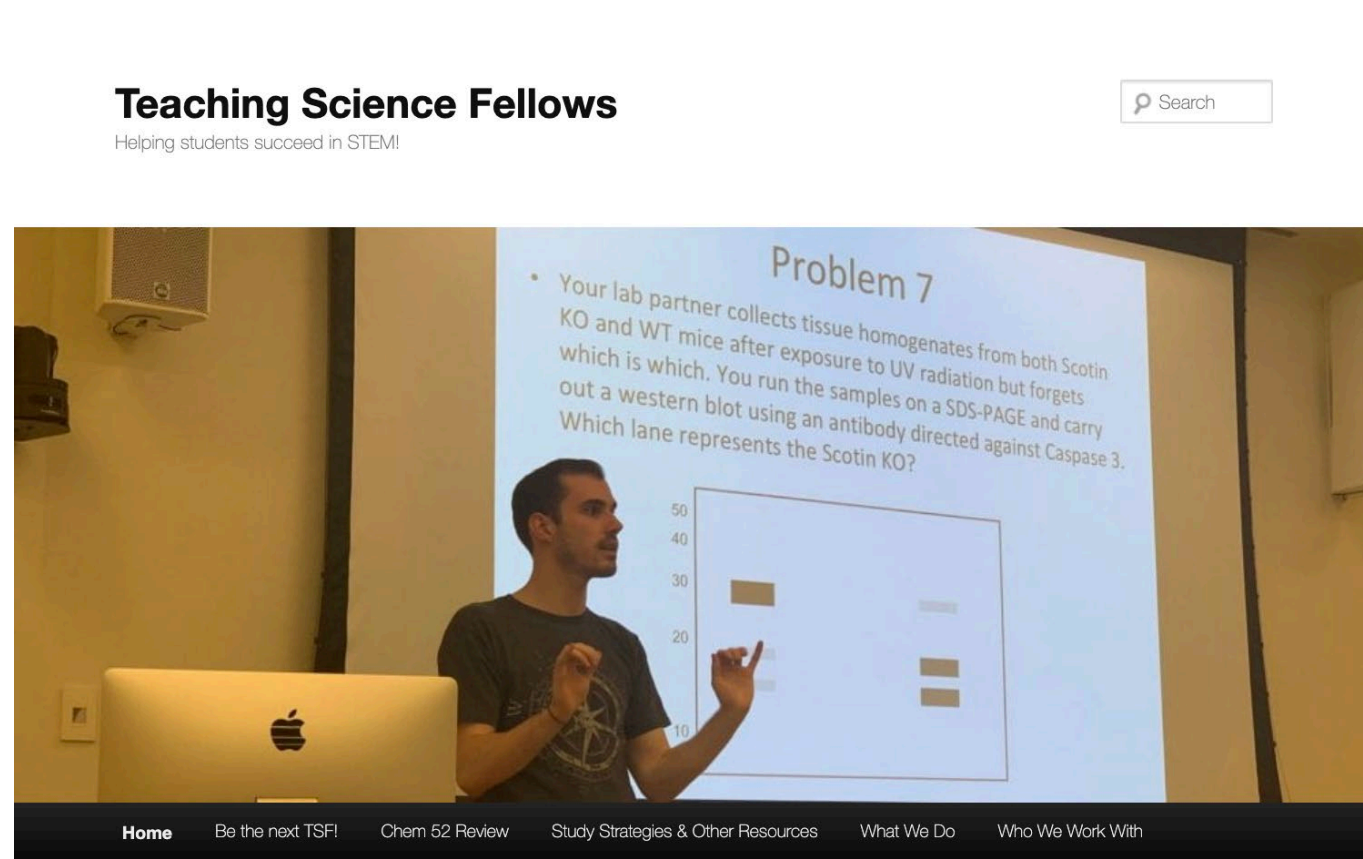


Frankie Carr '22
Biology & Chemistry
FYSEP Liaison

Link to our web site learning
resources & appointment calendars



Teaching Science Fellows Website



<http://sites.dartmouth.edu/teachingsciencefellows>

OR Google: Dartmouth Teaching Sciences Fellows

It's the first thing that pops up!

Check out our Study Strategies including videos of study tips!

Mathematics

Math is not only a major, but math classes are pre-requisites for STEM majors, so starting at the correct place is critical.

Little or no math and science background

- If you've never taken calculus, take MATH 1 this Fall and MATH 3 in the Winter

Some math and science background

- If you've taken some calculus but do not place out of MATH 3, take MATH 3 this Fall

A great deal of math and science background

- You are placed into MATH 8 or higher
- Depending on what you think you might want to major in, take more Math in the Fall or Winter
- If you are considering majoring in Math, take a Math class Fall term

Biology

Little or no math and science background

- If placed into MATH 1, take MATH 1 this Fall and MATH 3 in the Winter
- Consider taking BIO 11 in the Winter or Spring
- Consider taking BIO 2 (Human Biology) this Fall (last offering)

Some math and science background

- If placed into MATH 3, take MATH 3 this Fall
- Take BIO 11 sometime this year; consider a foundation course (BIO 12-16)
- Consider taking CHEM 5 in the Winter

A great deal of math and science background

- Take Biology 19 in the Fall or a foundation course (12-16) in the Fall or Winter (BIO 12-16); consider taking a second foundation course this year
- Consider taking CHEM 5 (Fall or Winter) and CHEM 6 (Spring) this year

Chemistry

Little or no math and science background

- If placed into MATH 1, take MATH 1 this Fall and MATH 3 in the Winter
- Take CHEM 5 in the Winter, CHEM 6 in the Spring

Some math and science background

- If placed into MATH 3, take MATH 3 this Fall
- Depending on your chemistry placement, either take CHEM 11 in the Fall or Spring (new offering), or take CHEM 5 in the Winter, CHEM 6 in the Spring. Both allow you to take organic chemistry sophomore year.
- Consider taking CHEM 5 in the Fall, if you have credit for MATH 3

A great deal of math and science background

- Take CHEM 11 in the Fall or Spring (new offering)
- If you have credit on entrance for CHEM 5 and CHEM 6, consider taking organic chemistry (in consultation with the Department)

Chem 5 prep site: <https://canvas.dartmouth.edu/courses/53399>

Computer Science

Students wishing to devote one course to the study of Computer Science should take COSC 1 offered in Fall, Winter, and Spring. No previous programming experience is required to take COSC 1 (over half of students taking COSC 1 have no computer programming experience). Students wishing to devote two or more courses to the study of Computer Science should begin with COSC 1 and COSC 10. Students wishing to take courses in Digital Arts should start by taking COSC 1 or COSC 2. ENGS 20 may substitute for COSC 1 in any program of study.

Little or no math and science background

- If placed into MATH 1, take MATH 1 this Fall and MATH 3 in the Winter

Some math and science background

- If placed into MATH 3, take MATH 3 this Fall

Please note:

- COSC 1 is a prerequisite for COSC 10

Earth Science

Prerequisites: Any one introductory Earth Science course (EARS 1-9 exclusive of EARS 7); EARS 40; CHEM 5 (or CHEM 10); and any one of the following courses taken at Dartmouth: MATH 3, MATH 8, MATH 9, MATH 11, MATH 12, MATH 13, MATH 14, MATH 23, or MATH 46.

Little or no math and science background

- If placed into MATH 1, take MATH 1 this Fall and MATH 3 in the Winter
- EARS 1 the Fall or Spring

Some math and science background

- If placed into MATH 3, take MATH 3 this Fall
- EARS 1 in Fall or Spring or EARS 18 in the Fall

A great deal of math and science background

- EARS 1 in Fall or Spring or EARS 18 in the Fall
- CHEM 5 in the Winter

Engineering

Little or no math and science background

- If placed into MATH 1, take MATH 1 this fall, MATH 3 - winter, MATH 8 - spring.
- First year: develop confidence in mathematics and work with a faculty advisor
- MATH 13, PHYS 13, PHYS 14, and ENGS 20 in the second year, begin engineering core courses during sophomore summer.

Some math and science background

- MATH 3 this fall, MATH 8 in the winter.
- PHYS 13 in the winter, PHYS 14 in the spring. MATH 13 or ENGS 20 or ENGS 21 in spring
- Plan to complete math and physics, plus ENGS 20 and 21, by the end of sophomore year, to begin taking engineering core courses during sophomore summer.
- CHEM 5 can wait until later.

A great deal of math and science background

- Take MATH 8 +13 or 11 in fall/winter, with PHYS 13 +14 in fall/winter or winter/spring.
- Take ENGS 20 or 21 in the Spring, the other during sophomore Fall. Talk to your engineering advisor about planning the second year.
- CHEM 5 can be taken first year, sophomore year, or wait until later

Biomedical Engineering and/or Pre-Health

- Follow math guidance above and consult with an engineering advisor
- Take CHEM 5/6 as soon as reasonable
- Begin Biology sequence (11/12) if schedule allows
- Take PHYS 13/14 in sophomore year

Physics and Astronomy

Little or no math and science background

- If placed into MATH 1, take MATH 1 this Fall and MATH 3 in the Winter (start with PHYS 13 Sophomore Fall)
 - Note: PHYS 3 & 4 are for non-majors (don't start here if you want to major)

Some math and science background

- If placed into MATH 3, take MATH 3 this Fall, AND take MATH 8 in the Winter
- Take PHYS 13 in the Winter, PHYS 14 in the Spring
- Students placing into MATH 11 or MATH 9 should consider MATH 9 or speak with a faculty member during the Math Open House.

A great deal of math and science background

- Take Physics 13, 14, 19 in the first year (or postpone 19 until Sophomore Fall)
OR
- Take 15/16/40 in the first year (the accelerated track)
 - Note: PHYS 15 is offered Fall/Winter and PHYS 16 is offered Winter/Spring; PHYS 40 offered Fall/Spring
 - Note: PHYS 15 requires that your high school physics used calculus and requires taking an on-line placement exam during orientation

Note for Premeds: PHYS 3 is now offered Summer/Fall/Winter and PHYS 4 Winter/Spring

Neuroscience

Prerequisites: PSYC 6, PSYC 10; two courses from among MATH 3, 4, 8, ENGS 20, COSC 1, 10; and two courses from among CHEM 5, 6, PHYS 3, 4

Little or no math and science background

- If placed into MATH 1, take MATH 1 this Fall and MATH 3 in the Winter
- Take PSYC 6 in Winter or next (sophomore) Fall

Some math and science background

- If placed into MATH 3, take MATH 3 this Fall
- If taking MATH 3 or another STEM course in Fall, take PSYC 6 in Winter or next (sophomore) Fall

A great deal of math and science background

- Take PSYC 6 Fall (if no other STEM courses) or Winter term

Neuroscience

Prerequisites: PSYC 6 & PSYC 10, plus four courses from the following: MATH 3, 4, 8; ENGS 20; COSC 1, 10, 31; CHEM 5, 6; PHYS 3, 4 (must have at least one CHEM/PHYS course; see [PBS website](#) for details)

Little or no math and science background

- If placed into MATH 1, take MATH 1 this Fall and MATH 3 in the Winter
- Take PSYC 6 (Intro to Neuroscience) in Winter or sophomore Fall

Some math and science background

- If placed into MATH 3, take MATH 3 this Fall
- If taking MATH 3 or another STEM course in Fall, take PSYC 6 in Winter or sophomore Fall

A great deal of math and science background

- Take PSYC 6 Fall (if no other STEM courses) or Winter term

Breakout Rooms

- Mathematics – Courtyard Café near the Hood Museum entrance
- Biology – Russo Atrium (Hood Museum of Art foyer)
- Earth Sciences – Bentley Lobby (outside Moore Theater)
- Chemistry – Moore Theater
- Neuroscience – Outside Courtyard Café
- Computer Science – Courtyard Café near Hinman
- Physics/Astronomy – Faculty Lounge (Top of the Hop, near Alumni Hall)
- Engineering – Top of the Hop

