GETTING STARTED IN MATH AND THE SCIENCES

Some beginning advice….

This Session

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

Goals:

- To introduce you to the Science Curricula at Dartmouth
- For you to assess High-School preparation in the Sciences and what that means for starting Science 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)

Interested in Pre-Health?

If you're considering beginning a Pre-health curriculum, the "Medicine & Health Fields Information Session" will be held on Friday morning, 8:30-9:30 AM, in Filene Auditorium (Moore Hall)

Who's here today
Departmental Representatives

- Mathematics – Scott Pauls, Professor and Chair
- Neuroscience – Catherine Cramer, Professor
- Engineering – Erland Schulson (session 1) Prof and Chair
  Eric Hansen (session 2) Professor
- Computer Science – Hany Farid, Professor and Chair
- Earth Sciences – Leslie Sonder, Professor
- Chemistry – Dean Wilcox, Professor and Chair
  - Teaching Science Fellow – Justin Halloran
- Physics – John Thorstensen, Professor and Chair
- Biology – Kathryn Cottingham, Professor and Chair
  - Teaching Science Fellow– Kevin Stanko

Overall info/advice

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

Know where you're starting

- Because, 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 AP courses in Math or Science
- Concern about Math/Science preparation
- Less than 700 on the SATI Math Test

Or, is this you?

- Placement into MATH 3
- 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 AP courses in Math or Science
- Concern about Math/Science preparation
- Less than 700 on the SATI Math Test

Some math and science background

- Placement into MATH 3
- 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

- Be cautious about doubling up in Science, Math, or Engineering classes in any particular term during your first year (There are exceptions, e.g. Engineering; consult with departments and your advisors)
- Two courses with labs in one term is always a large work load. Avoid 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 even 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
- Do not have 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

- There is no reason for you to take two courses with lab in the first term. It is probably a good idea to wait at least until Winter term.
- 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 choose to)
- You should be able to fulfill the prerequisites for your science major in your first year
- It is OK 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
(This 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 a 69. This could very well be a passing 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: Learning strategies
- Tutor Clearinghouse: peer tutors and study groups
    - Sign up early in the term
- Form your own study group
- Engineering organizes study sessions for potential engineering students taking the mathematics and physics prerequisites, focusing on how these classes relate to engineering.

Teaching Science Fellows

Kevin Stanko 16 (Biology)
and
Justin Halloran 16
(Chemistry)

Office: 123 Life Sciences Center

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

E-mail or drop by!

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 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

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 2 in the Fall, and/or BIO 11 in the Winter or Spring

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 a Biology foundation course in the Fall or Winter (BIO 12-16); consider taking a second foundation course this year
- Consider taking BIO 5/MATH 5 this Fall
- 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
- Take CHEM 5 in the Winter, CHEM 6 in the Spring (this allows 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 10 in the Fall (it is your only chance)
- If you have credit on entrance for CHEM 5 and CHEM 6, consider taking organic chemistry (in consultation with the Department)

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

A great deal of math and science background

- Consider taking MATH 8 or beyond (check COSC prerequisite requirements)

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 (or other intro) in the Winter

Some math and science background

- If placed into MATH 3, take MATH 3 this Fall
- EARS 1 (or other intro) in the Fall or Winter

A great deal of math and science background

- EARS 1 (or other intro) in the Fall or Winter

Engineering

Little or no math and science background

- If placed into MATH 1, take MATH 1 this fall, MATH 3 in the winter, MATH 8 in the spring. Use the first year to develop confidence in mathematics. Be sure to speak to a faculty advisor in Engineering about planning your program.
- Take MATH 13, PHYS 13, PHYS 14, and ENGS 20 in the second year, preparing to begin engineering core courses during sophomore summer.

Some math and science background

- If placed into MATH 3, take MATH 3 this fall, MATH 8 in the winter.
- Take PHYS 13 in the winter, PHYS 14 in the spring. Talk to your engineering advisor about taking MATH 13 or ENGS 20 or ENGS 21 in the 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 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 sophomore year or wait until later

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
- 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
- Take PHYS 13 in the Winter, PHYS 14 in the Spring

A great deal of math and science background

- Take PhyPHYSsics 13, 14, 19 in the first year (or postpone 19 until Sophomore fall)

OR,

- Take 15/16/24 in the first year (the accelerated track)

Note: PHYS 15 requires that your high school physics used calculus and requires taking an on-line placement exam during orientation

Neuroscience

Prerequisites: PSYC 6, PSYC 10; Four courses from among MATH 3, 4, 8, CHEM 5, 6, PHYS 3, 4, ENGS 20, COSC 1, 10, 31

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
- Take PSYC 6 Fall or Winter term

A great deal of math and science background

- Take PSYC 6 Fall or Winter term
- Consider taking PSYC 10

Web address

The Slides for this presentation can be found at:

http://www.dartmouth.edu/~ugar/premajor/

Or, Google the phrase

"PreMajor Dartmouth"