Learning Goals for Bio 71:

The schedule of class meetings and lecture topics are provided on a following page. On this page I would like to explain to you the learning goals of BIO 71 and how I intend to meet them.

The overriding goal this term will be to improve your ability to read, think about, understand the scientific basis of, and critically analyze and evaluate original research data presented to you in the form of papers published in the scientific literature. While accomplishing this, I hope also to expose you to a lot of interesting cell biology, some or most of which, perhaps, none of you have ever heard about before. During each class period, we will discuss facts and information with the goal of learning how to think about and interpret scientific data. I will ask you questions in class and expect you to take an active part in the discussion, both by answering questions posed of you, and asking questions of me when something is not clear to you.

There will be weekly reading assignments that will form the basis for these discussions, and the references for the reading assignments will be posted on Canvas several days before the assignment will be discussed. It is important that you read these assignments before class. This is essential in order not only to have an active and productive discussion of the topics and data covered during each class meeting but also for you to be successful in the class participation component that with help to determine your grade.
Topics for discussion (roughly) and homework assignment schedule
(Please see Canvas for papers to read for class discussions)

4 Jan Course overview; functions of motile cilia and flagella
6 Jan Details of the methods used to study cilia and flagella: immunology,
video DIC, fluorescence and TIRF microscopy, targeted gene knockouts
9 - 13 Jan Cilia and flagella basics: assembly, regeneration, and
intraflagellar transport (IFT)
16 Jan MLK Day, no class
18 - 20 Jan IFT motors (kinesin-2, OSM 3, dynein 1b), flagellar length control,
and post-translational modifications
acional
  18  Jan  Assignment #1 due by the start of class
23 - 27 Jan Additional functions of motile cilia: mating, adhesion,
gliding, and signaling
30 Jan - 3 Feb Non-motile (primary) cilia: olfaction, vision, and hearing

  1  Feb  Wed  Assignment #2 due by the start of class
6 - 10 Feb Signal transduction by primary cilia: polycystic kidney disease,
IFT88/Tg737
13 - 17 Feb Hedgehog signaling, Bardet-Biedl Syndrome, and the BBSome

  15  Feb  Assignment #3 due by the start of class
20 - 24 Feb Situs inversus, immotile cilia syndrome, left/right dynein,
and calcium signaling
27 Feb - 3 Mar Student led paper discussion

  1  Mar  Assignment #4 due by the start of class
6 Mar Student led paper discussion
8 Mar Student led paper discussion

  12  Mar  Sun  Final Homework Assignment Due 11:30 AM
Office Hours:

Tuesday and Thursday, 1 – 3 PM, or most any other time as well. Just check with me first to be sure I am available at the time you want to drop by. My office is 222 LSC.

Assignments and grades in Bio 71:

Grading will be based on four written assignments, plus class participation. Assignments will contain questions for you to answer about a paper (or papers) on a particular class topic.

<table>
<thead>
<tr>
<th>Assignment #1</th>
<th>Assignment #2</th>
<th>Assignment #3</th>
<th>Assignment #4</th>
<th>Final Assignment</th>
<th>Class participation</th>
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<tbody>
<tr>
<td>graded, but not recorded (i.e. a chance for you to “practice”)</td>
<td>15%</td>
<td>20%</td>
<td>20%</td>
<td>25%</td>
<td>20%</td>
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Here is how you are to approach these homework assignments. Pay attention, as the rules change for different assignments:

Assignment #1: You may discuss the questions and the possible answers with other people, and use any sort of resource available to you to aid you in answering the questions. However, when you prepare your assignment for submission, you must do it on your own. That is, you may not prepare a written answer or answers with another person and simply copy and paste the same answer into two different assignments, etc. To do so would be a violation of the Principle of Academic Honor. Everything you submit must be in your own words, written only by you, and referenced accordingly if you had assistance from another person or a printed resource (paper or electronic, etc).

Assignment #2: The same rules apply for assignment #2 except that you may not discuss the questions or the answers to the questions with anyone else at any time. You may, however, consult any other resources available to you (texts, reference books, web pages, etc.). Be sure to reference any sources.

Assignments #3 and #4: These are also to be completed independently of each other (other = other students in the class) and independently of any other form of human contact. You are also not allowed to use most forms of reference material. This means that during the writing of these assignments, you may only consult the data in the assigned research paper(s) or other relevant papers published in professional journals (the only web access you are allowed), and you must not discuss the assignments with each other, your friends, relatives, faculty, parents, acquaintances, supreme beings, etc. To do so would be a violation of the Principle of Academic Honor.

Final Assignment: This will be due at the time of the final exam for a period 2 class, or 11:30 AM, Sunday, 12 Mar 2017 (or any time before). It is to be completed by each student alone, without prior discussion with anyone and without reference to any materials such as research
articles, reference books, texts, friends, the web, etc. To do so would be a violation of the Principle of Academic Honor.

Class Participation:

Part 1: Because this is a discussion-based course, things only work well when everyone participates in the discussion. So, be sure that you take an active part in each class meeting either by trying to answer a question asked of you, or by asking a question yourself, etc.

To encourage participation by everyone, 20% of your grade will be derived from class participation. Therefore, to ensure that everyone has an equal opportunity to participate, class participation will be controlled in part by a deck of cards.

After the first class, I will assign specific cards from a standard, 52 card poker deck to each student. I will assign the jokers to myself. Class will begin with a shuffle and cut of the deck. When I pose a question to the class, I will turn over the top card, and that person will answer. Points will be awarded as follows:

- 3 pts for a correct answer
- 2 pts for a partially correct answer
- 1 pt for trying, but the answer is incorrect
- 0 pts for not trying at all

If an answer is anything less than totally correct, anyone in the class can volunteer an answer and earn some points. As the class proceeds, preference for doing so will be given to folks whose card has not turned up yet that day (or in a while).

If a joker turns up, I will answer the question myself, or someone can volunteer.

Part 2: During the last two weeks of the term (last five class meetings) each student will choose a paper relevant to the course, provide brief (10-15 min) background information, and then lead the class in a summary of the data, methods, conclusions, etc. Some possible topics from which you might choose include:

- anything that provides new or additional information on a topic we have already discussed in class
- obesity
- polydactyly
- retinitis pigmentosa
- anosmia (loss of the sense of smell)
- hydrocephaly
- the immune synapse
- evolution of cilia and flagella

Academic Honor Principle:

The Dartmouth College Student Handbook states "Fundamental to the principle of independent learning are the requirements of honesty and integrity in the performance of academic assignments, both in the classroom and outside. Dartmouth operates on the principle of academic honor, without proctoring of examinations. Students who submit work which is not their own or who commit other acts of academic dishonesty forfeit the opportunity to continue at Dartmouth."
In Bio 71, any written report submitted for grading must represent the original words and writing of the student submitting the work and must document any help received from other sources, as noted above on pp. 3-4. There can be no exceptions.

Thus, DO NOT share computer files of work (including text, graphs, tables, figures, charts, etc.) to be submitted for grading! The student misrepresenting the work of another as his or her own is in violation of the Academic Honor Principle. The Committee on Standards will very likely find the student providing the original file also to be in violation of the Honor Principle.

This is very important: Honesty and integrity form the foundation of the academic pursuit of knowledge. Without honesty and proper recognition of sources, there can be no true pursuit of new knowledge. In recognition of this, I will not overlook any violation of the Academic Honor Principle. Indeed, the Faculty Handbook of Dartmouth College states explicitly that faculty are obligated to report suspected violations of the Academic Honor Principle to the Dartmouth College Judicial Affairs Officer.

Note to Students with Physical or Learning Disabilities:

I encourage students with disabilities, including invisible disabilities such as chronic illnesses and learning disabilities, to arrange for accommodations that might be helpful. Please meet with me as soon as possible, preferably during the first week of class, to discuss possible accommodations. All discussions will be confidential, although the Academic Skills Center may be consulted to verify the documentation of the disability and to discuss appropriate accommodations.

Religious Observances:

Some students may wish to take part in religious observances that occur during the term. If you have a religious observance that conflicts with your participation in this course, please speak with me as soon as possible to discuss appropriate accommodations.