

Course 20 Restricted Electives: Student Feedback (Class of 2009 & **Class of 2010**)

Biomechanics & Biophysics

2.71 Optics (Prereq: 8.02; 18.03; 2.004)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
Yes	Very easy through first exam, harder through second (second comparable to 20.330 but the pssets are difficult, covering additional material not covered in class)

2.785J/3.97J/20.411J/HST.523J Cell-Matrix Mechanics (Prereq: 3.091 or 5.11 or 5.111 or 5.112; 2.005 or 5.60; 7.01x)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
Yes	Similar to 20.310

3.052 Nanomechanics of Materials and Biomaterials (Prereq: 3.032 or permission of instructor)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
Yes	Comparable but related writted pssets instead of problems

BioMEMS/Bioinstrumentation

2.674 Micro/Nano Engineering Laboratory (Prereq: 2.001; 3.091 or 5.111)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
Yes	Easier compared to Course 20 classes, but with a lot of work

Synthetic Biology & Macromolecular Design

6.002 Circuits and Electronics (Prereq: 18.03; 8.02; 8.022 or 6.01)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
Yes (18.02, 8.02)	About equal
Yes	Comparable, good TA's, tutorials, textbooks which allows to go into more depth, but better support and resources

20.902 Advanced Topics in Synthetic Biology (Prereq: permission of instructor)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
Yes	Completely different style of class from 20.310,20.320,20.330

Computational & Systems Biology

18.06 Linear Algebra (Prereq: 18.02)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
Yes (18.02)	About equal difficulty, maybe a bit easier
Yes	Easier (18.01,18.02,18.03,18.06 are all fairly straightforward)
Yes	Comparable
Yes	Comparable, well taught and organized
Yes	This is a good class for all engineers to take
Yes	Easier, more straightforward psets
Yes	I thought it was a relatively easy class

6.003 Signals & Systems (Prereq: 6.002 or 6.02)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
Yes, 20.309 will also help	Easy if you already completed 20.309, conversely taking this subject will help in 20.309
Yes	Comparable

6.041 Probabilistic Systems Analysis (Prereq: 18.02)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
N/A	Similar in difficulty to 20.330 (on average)
Yes	Comparable to 20.330 (math intensive)
Yes, could even take as a freshman	Easier than core Course 20 Classes, but extremely useful for courses like 20.390 that need a little background in probability and even for 20.320
Yes	Comparable to other core Course 20 classes
Yes, (would be able to take freshman yr)	1.2 times as hard, completely new material
Uncertain	So much harder

6.034 Artificial Intelligence (Prereq: 6.001 or 6.01)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
Yes	Easier than Course 20 classes (taken in the Fall), programming experience needed
Yes	Similar difficulty, yet completely different material
Yes (requires 6.01 but 6.00 was sufficient)	Focused on teaching big ideas & then expected implementation. No focus on technical programming skills - all of that is assumed.

6.047 Computational Biology: Genomes, Networks, Evolution (Prereqs: 6.006, 6.041, 7.01x)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
Almost, 6.001 was very helpful. 6.041 was necessary	Harder than any Course 20 classes
6.006 will help	Closest in workload was 20.309

20.390 Foundations of Computational and Systems Biology (Prereq: 7.05 or 5.07; or 7.01x and 6.001)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
Yes (6.034 isn't necessary but would be helpful)	More difficult than some - but manageable pace

Microbial and Ecological Systems**1.018/7.30J Ecology I: The Earth Systems (Prereq: none)**

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
Yes	It is not a hard class. I would have liked to take the more advanced classes within the microbial systems section

7.21 Microbial Physiology (Prereq: 7.03; 7.05 or 5.07)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
No, more biochemistry would probably make it easier to follow	I can't really comment on the difficulty because I was a listener
Yes	Pretty similar
Yes	Less difficult - a different approach since it's not as engineering-oriented.

Pharmacology and Toxicology**5.08J/7.08J Biological Chemistry (Prereq: 5.12; 5.07 or 7.05)**

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
Yes (5.07), I've heard 7.05 does not prepare you as well	Very similar to 7.06 (design/interpret experiments), Best taken right after 5.07
Yes (5.07)	Harder problems, but material was easier to understand

20.106J/1.084J Systems Microbiology (Prereq: 5.111; 5.112 or 3.091; 7.01x)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
Yes - but would help to take 7.03	About the same difficulty
Yes	Moderate
Yes	Loved this class - more like a bio class in exam style.

20.104J/1.081J/ESD.053J Environmental Risks for Common Disease (Prereq: Biology GIR, Chemistry GIR)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
Yes	It's a different class...

20.102 Macroepidemiology and Population Genetics (Prereq: 18.01)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
No - would help to take statistics	Less math, more writing (easier)
18.01 semi-useful, statistics would be a great pre-req.	The course was technically easier - not as much computation, but it relied heavily on independent research

9.15 Biochemistry and Pharmacology of Synaptic Transmission (Prereq: 9.01; 7.05)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
Yes	Easier compared to Course 20 classes

20.201 Mechanisms of Drug Actions (Prereq: permission of instructor)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
Should include 5.12, 5.07/7.05	Easier than 20.310 and 20.320 but the focus of the class is not as technical. Course is useful for 20.380
Yes	Had a workload comparable to 20.330
Somewhat, could use more chemistry	It is about the same in terms of difficulty -however need more in depth chemistry knowledge.
Yes	Much more straightforward. Material was less math oriented and therefore seemed easier to me.

7.37J/20.361J/10.441J Molecular and Engineering Aspects of Biotechnology (Prereq: 20.110/20.772J; 2.005; 3.012; or 5.60; 7.06)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?

Yes mostly - specific biology techniques I feel were lacking (in detail specifics)	Very different from core classes, similar to 20.440
Yes	Different style - lots of reading and analyzing papers. Definitely interesting and valuable
Mostly	More difficult - more material on efficient ways to extract information from papers

Cell & Tissue Engineering

20.441J/2.79J/3.96J/HST.522J Biomaterials-Tissue Interactions (Prereq: 3.091; 5.111 or 5.112; 2.005 or 5.60; 7.01x)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
Somewhat adequate, it's hard to find a pre-req for tissue interactions (maybe 7.06 and 20.310 would help)	The class was easier, but because it's a graduate level class the grading curves were much higher
Yes	Very easy, almost no work and the material was covered at an extremely broad level
Yes	Had a relatively light workload but was graded harshly (it was less work than 20.310,20.320,20.380)
Yes	Easier compared to Course 20 core classes
Yes	Quite easy - light workload, almost a "survey" course
Yes	Very easy relative to any Course 20 class. Probably 1/2 the work load of 20.310.
Yes	Didn't get much from this class, lots of qualitative description, ~0.8x as hard

7.37J/10.411J/20.361J Molecular and Engineering Aspects of Biotechnology (Prereq: 20.110/2.772; 2.005; 3.012, or 5.60; 7.06)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
Yes	Harder than 7.03 but easier than 7.06
Yes	High workload but not as difficult as the Course 20 core classes
Yes	It required a lot of reading but it was a great intro to analyzing primary literature

20.342 Molecular Structure of Biological Materials (Prereq: 5.07 or 7.05)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
Yes	Easier than average, so long as you take good notes. Lots of time required for midterm exam and final paper
Yes	Less difficult than Course 20 core classes. New topic, very interesting
Yes	Less difficult than 20.310
Yes	Easy, interesting and useful but not much work

20.451J/2.782J/3.961J/HST.524J Design of Medical Devices and Implants (Prereq: 2.79J or permission of instructor)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
Yes	Very easy, project not technical focused - talked about IP/business aspects as well

20.370/2.791J/6.021J Quantitative Physiology: Cells and Tissues (Prereq: Physics II GIR; 18.03; 2.005; 6.003; 6.071; 10.301)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
Yes - took after 9.01 and 6.022 which helped	About the same as 20.330 (repeats a lot of 20.330 concepts so may not be a good class for Course 20 students)

20.371J/2.792J/6.022J/HST.542J Quantitative Physiology: Organ Transport Systems (Prereq: 18.03; 8.02)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
Yes	Average difficulty, a lot of work in the class. Very interesting though and the labs were incredible.
Not quite- need physiology, fluid mechanics	Very difficult - labs, psets, and exams were very involved and technically advanced. Overall the class was pretty overwhelming
Yes	It was more memorization work than any Course 20 class, conceptual difficulty was equivalent to 20.320

7.20J/HST.540J Human Pshiology (Prereq: 7.05)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
Yes	Pretty similar
Yes (5.07,7.03,7.06)	On par with 20.320 and 20.330
7.06 and 7.03 helped prepare me for the class	More difficult than 20.320, the class required more knowledge of biology lab experiments.
Yes	Easier than core classes (if could do over would take 20.371)

7.23 General Immunology (Prereq: 7.03; 7.05; 7.06)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
Yes	It is somewhat hard to compare the difficulty compared to the core classes, Immunology is an important part of Bioengineering research.
	Not exactly difficult, but harder exams. Very descriptive & info-heavy so a lot of memorization,

Yes	which was boring/frustrating
Yes	Not as difficult

Human Pathophysiology

7.27 Principles of Human Disease (Prereq: 7.03, 7.05, 7.06)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
Yes	Similar, slightly less engineering focused than core Course 20 classes
Yes	Easier, good qualitative overview of different diseases but not very demanding
Yes	Less difficult

Neuroscience

9.07 Statistics for Brain & Cognitive Science (Prereq: 18.01; 18.02)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
Yes	About the same difficulty, very organized

9.29J/8.261J Introduction to Computational Neuroscience (Prereq: 18.03; 8.02)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
No - 18.06 would help (though it wasn't hard to learn on my own a few 18.06 concepts to catch up)	Fairly difficult. The programming was heavy and more involved than the core classes. Very well taught and interesting.

7.29J/9.09J Cellular Neurobiology (Prereq: 7.05)

Did the pre-requisites adequately prepare you for this class? If not, what other pre-requisites would be useful for this class?	How would you rate the difficulty of this class compared to other core Course 20 classes (20.110, 20.310, 20.320, etc.)?
No - 9.01 would help	Hard in a different way. Lots of memorization
Yes	Easier compared to Course 20 classes
Yes	It is less difficult