My intent in this class is to give you practical experience in molecular systems biology. You will learn a combination of computational methods and experimental methods surrounding biochemical states of eukaryotic cells with the intent of understanding how these molecules impact normal and diseased physiology of mammalian cells. We will focus on cancer, diabetes and inflammation as disease topics. Although we will cover a small subset of the methods possible, you will ideally have a solid foundation and be able, in the future, to easily learn new measurement modalities or computational methods. Coursework and lectures revolve around the following goals of learning:

1) To broaden your perspective on how mammalian cells are regulated and controlled at the biochemical level
2) To understand the measurement modalities for measuring molecules on a systems-level, including understanding the limitations, linearity and noise
3) To understand the breadth of computational tools available for deriving meaning from such biochemical data
4) To choose the best combination of measurements, experimental conditions, and computational methods to optimally answer a question of interest

In addition to practical skills, coursework is also designed with professional development in mind. These are the main goals considered regarding professional development:

1) Improve critical thinking regarding current literature
2) Gain experience in summarizing and presenting research ideas.

The attached schedule is a tentative plan for topics and assignments. Professor Naegle reserves the right to make changes to the schedule throughout the course as needed.

References (on reserve at Olin library, except where noted):
Lodish, “Molecular Cell Biology” 2004 or 2012 (Chemistry Library Permanent Reserve)
Find other references and tutorials in “Course Documents” on Blackboard

Grade
10% Participation
10% Literature presentation
40% Homework
20% Midterm
20% Final Exam

Participation
I expect every member of the class to participate equally in the process of learning. This process includes active discussion within the class and proper preparation for class discussions. Along with participation comes respect for your peers by offering them an equal opportunity to participate. There will be active discussion throughout the course
and it is important to recognize there may often be many possibly correct answers. I fully expect all class interactions to remain cordial and respectful. Acting consistently outside of any of these expectations will lead to a decrease in this portion of your grade.

**Homework**
Homework will often consist of implementations from primary literature. Hard copy results of the homeworks will be due by the end of class on the indicated due date (Never include printed Matlab code). Matlab code must be submitted via blackboard before the class begins. Code must be submitted as a zipped folder with all required dependencies directly in that folder. Name the script that produces the results as main.m and the folder name as LASTNAME_HW<X>.zip. Make sure this code works as a stand-alone before submitting it. Specific directions for code submission may vary by homework.

**Literature Presentation**
In the second week of the semester students will sign up for one of several primary research papers to present to the class. Likely 2 to 3 students will be responsible for introducing the paper, highlighting the key points, leading a discussion, and concluding the paper.

**Access to Readings**
All course readings are available on the course reserves section of Blackboard.

**Late Assignment Policy:**
Assignments should be turned in by the end of class on the date listed on the syllabus. Permission to turn in late assignments should be requested in advance of class on the date the assignment is due. It is the responsibility of the student to ensure that their request for permission to turn in late assignments has been approved before the start of class. Late assignments will be reduced by 1 letter grade for each day they are late and no late assignments shall be accepted after the assignment has been returned to other students.

**Regrade Policy**
If you wish to request a regrade you must submit your homework within one week after it has been handed back with a regrade request form describing the reason for the request, the possible points to be changed if you achieved full credit for the dispute under question and the impact the regrade will have on your overall grade. Regrades will be returned at the end of the semester and will only be performed if the change in your grade would have significant effects on the overall outcome of your grade.

**Independence and collaboration:**
As in most work areas of research and work, you will find collaboration enhances your own understanding and improves the final outcome of a homework. Homeworks are individual assignments and as such, are expected to represent your own work. However, collaboration regarding development of code and ideas is expected. There is a line that I hope you can easily decipher between generating important ideas and direct
copying of another person's work. If I see evidence of direct copying I will treat these incidents as plagiarism for both parties involved (see below).

**Plagiarism:**
Copying phrases or sentences from sources other than one's own writing without proper citation is plagiarism. This includes textbooks, classnotes and papers distributed for the course. Plagiarism is considered cheating. The first incident will result in a warning and loss of credit for the portion of the assignment where plagiarism is found, the second incident will result in zero points for the assignment. The third incident of plagiarism will result in notification of the School of Engineering Judicial Board and a failing grade in the course.