CHE353F Engineering Biology
Fall 2014

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Teaching assistants:

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<thead>
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<tbody>
<tr>
<td>Anne Hsieh</td>
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Lectures:

<table>
<thead>
<tr>
<th>Monday</th>
<th>2 pm</th>
<th>SF1105</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wednesday</td>
<td>2 pm</td>
<td>SF1105</td>
</tr>
<tr>
<td>Thursday</td>
<td>2 pm</td>
<td>TZ6</td>
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Tutorials (one of the following 4 possible times):

<table>
<thead>
<tr>
<th>TUT0101</th>
<th>Mon 10:00</th>
<th>11:00</th>
<th>BA2195</th>
<th>Elisa</th>
</tr>
</thead>
<tbody>
<tr>
<td>TUT0102</td>
<td>Tue 16:00</td>
<td>17:00</td>
<td>BA2195</td>
<td>Anne</td>
</tr>
<tr>
<td>TUT0103</td>
<td>Wed 11:00</td>
<td>12:00</td>
<td>BA2195</td>
<td>Elisa</td>
</tr>
<tr>
<td>TUT0104</td>
<td>Thu 13:00</td>
<td>14:00</td>
<td>HA410</td>
<td>Anne</td>
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Grades:

- Final Exam 60%
- Midterm exam 20% [Oct 23 at 7 pm, room TBA]
- Tutorials 20%

Course Description:

- Introduce basic concepts in cell and molecular biology and relate them to physiological phenomena or disease.
  - Cellular and molecular biology (DNA/RNA/proteins, membranes, receptors, signal transduction)
  - Introduce some aspects of developmental biology, inflammation and immunity
- Introduce how to translate (biological) descriptions and observations into engineering descriptions (or mathematical expressions).
- Focus on experimental methods and data interpretation and problem solving (in tutorials).
- Focus on biological mechanisms – how cells communicate and function; how complex organisms develop from a single cell; how the body resists infection, etc
**Learning Objectives:**

- An enhanced level of interest in biology.
- Learn how to extract critical information/principles from (a large amount of) textual information or detail (i.e. learn how to read)
- Develop an understanding of basic experimental methods and biology data interpretation (“how to read graphs”)
- Learn to meld qualitative and quantitative information
- Learn how to distinguish between a high level overview of a situation and when more precision is called for
- Appreciate the connections between molecular and mechanisms and physiology and pathology

**Tutorials:**

In addition to asking questions of the TA, the tutorials are intended to supplement the material of the course in a small group format. Most weeks, you will focus on a different experimental method (relevant to the [previous week’s] lecture material) with a set of questions to guide you through the method and a data set. Some weeks, you will be solving problems that involve a calculation.

You will work within a group of 5 students (groups will be arranged by the TA before or at the first class) to answer the questions (some internet searching will be helpful) – nothing to hand in. Instead tutorial marks will be based on attendance and in-tutorial participation. Students are expected to have read materials provided both in-lecture and in-tutorial and should be prepared to discuss the topic of the week during the tutorial. Exam questions, at least in part, will be drawn from or based on these homework assignments.

Attendance at the tutorial is mandatory. Failure to attend, without a petition, may lead to an incomplete. You are expected at the tutorial on time (i.e 10 minutes after the hour). Chronic latecomers will be penalised.

**Textbook:**

The required textbook is Volume 1 of Sadava et al, Life Science of Biology, 10th edition. This is part of a larger book, sections of which we will use from time to time. These other chapters will be handed out as needed via the course web-site.

This book is written at a level that you should not find difficult and I don’t expect you to have trouble keeping up with the reading. Nonetheless, I advise you not to leave the reading until the last minute, but rather discipline yourself to read the relevant chapters each week. If you wish a more challenging and more detailed treatment of the topics of the course, I recommend you use the Molecular and Cell Biology text by Lodish et al (e.g., the sixth edition). Lodish is the standard undergraduate text for students in the life sciences. The engineering science students who are learning similar topics in a separate
course, use “Cell and Molecular Biology” by Karp (7th ed I think) – this is easier to read than Lodish, but probably more advanced than we need for this course.

Course outline and lecture notes:

The course outline is available in the form of a detailed lecture schedule. The schedule is available on the website, indicating the topics for each class or tutorial and some deadlines. It will be updated periodically. The lecture notes (PowerPoint / PDF) will be available on blackboard. Additional materials relevant to the course, either as background or core, will be posted periodically to Blackboard. You are responsible for all material presented in lecture and tutorial. You should read the additional material that is provided separately but you are not expected to know it in detail. You should be prepared to tie in the lecture and tutorial material with the additional supplementary material.

Website:

We will use Blackboard for this course. All handouts will be available here. You will also be able to check your grades. Watch regularly for new or updated handouts and class announcements.

Schedule:

Please check the schedule regularly for changes and updates, especially with regard to deadlines.