**BISC 411- Cell Biology**

**Spring 2020**

This course will explore the current understanding of basic cellular processes. It is geared towards

advanced Biological sciences majors who have taken BISC 320. The course will be divided into two parts. In the first part of the course, Prof. Liman will examine transport across cell membranes, and cell

signaling. Where possible we will discuss how cellular processes are important at the level of the tissue and of the organism, both in normal physiology and in disease states. In the second part of the course, Prof. Arnold will concentrate on synthesis, processing and trafficking of proteins. A major component of the course will be the discussion of original research papers, each of which directly addresses a topic that is discussed in the lectures.

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| **Lecturers**: | Don Arnold [darnold@usc.edu](mailto:darnold@usc.edu) | RRI 204B | Ph: 821-1266 Fax: 821-1818  Office Hours: |
|  | Emily Liman [liman@usc.edu](mailto:liman@usc.edu) | HNB 301 | Ph: (213) 821-1454  Office Hours: TBD |

**Textbook**: Molecular Cell Biology, sixth edition; Lodish, Berk, Kaiser, Krieger, Ploegh, Amon, and

Martin; Freeman Publishing, 2016. Other readings will be distributed.

**Lecture**: 11:00-12:20 TTh. ZHS 360

**Teaching Assistant** None

**Grading**: This course will be graded on a curve depending on the total number of points earned. The maximum points for different components of evaluation are as follows. The final will cover only the material in the second half of the class (non-cumulative)

Class Participation 10 points

Midterm 45 points

Final Exam 45 points

Course Total 100 points

**General Policies**:

**Format of exams**: fill-in-the-blank, short answer, and essay style based on lecture material and papers.

**Class participation:** attendanceat class is required. Students are expected to read the papers prior to class and come prepared to discuss them. Class participation grades will be determined based on student’s contribution to the discussion and attendance.

**Midterm Makeup**. There is no makeup exam. If you need to miss the midterm, you must submit a doctor’s note within 1 business day of when the exam was scheduled. If a valid doctor’s note is submitted, you will have the opportunity to submit a paper on a topic related to the course, but selected by the instructor. The grade for this paper will be used in place of the midterm grade. The length will be between 4-5 pages.

**Use of Pencil on Exam**: Use of pencil on the exam is allowed. However, note that this may affect our ability to re-grade the exam in the event of a dispute.

**Re-grading of exams:** Correct answers will be discussed during the lecture following the exam and any concerns about grading should be raised at that time. The entire exam will be re-graded, and all decisions will be final.

**Disabilities.** Students requesting academic accommodations based on a disability are required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP when adequate documentation is filed. Please be sure the letter is delivered to Drs. Arnold or Liman as early in the semester as possible. DSP is open Monday-Friday, 8:30-5:00. The office is in Student Union 301 and their phone number is (213) 740-

0776.

**Academic Conduct**: Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Section 11, *Behavior Violating University Standards*[https://scampus.usc.edu/1100-behavior-violating-university- standards-and-appropriate-sanctions/](https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions/). Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct/>.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the *Office of Equity and Diversity*  <http://equity.usc.edu/>or to the *Department of Public Safety*  [http://capsnet.usc.edu/department/department-public- safety/online-forms/contact-us](http://capsnet.usc.edu/department/department-public-safety/online-forms/contact-us). This is important for the safety whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. *The Center for Women and Men*  <http://www.usc.edu/student-affairs/cwm/>provides 24/7 confidential support, and the sexual assault resource center webpage [sarc@usc.edu](mailto:sarc@usc.edu) describes reporting options and other resources.

**Support Systems:** A number of USC’s schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the *American Language Institute* <http://dornsife.usc.edu/ali>, which sponsors courses and workshops specifically for international graduate students. *The Office of Disability Services and Programs* <http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html>provides certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, *USC Emergency Information*

<http://emergency.usc.edu/>will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.

**Disclaimer**: It may be necessary to make some changes in the syllabus during the semester.

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| **BISC 411 Schedule of Lectures** | |  |
| **Date**  14-Jan  16-Jan  21-Jan  23-Jan  28-Jan  30-Jan  4-Feb  6-Feb  11-Feb  13-Feb  18-Feb  20-Feb  25-Feb  27-Feb  3-Mar  5-Mar  10-Mar  12-Mar  17-Mar  19-Mar  24-Mar  26-Mar  31-Mar  02-Apr  07-Apr  14-Apr  16-Apr  21-Apr  23-Apr  28-Apr  12-May | **Lecturer Topic Reading** |  |
| Liman Techniques for Studying Cells I Section 9.2 |
| Liman Membrane transport, pumps, symporters Chapter 11.1-11.6 |
| Liman Membrane potential, co-transporters and Chapter 11.1-11.6 epithelial transport |
| TBD Ion channels, structure function and diversity Chapter 23.2 |
| Liman Paper 1: Jentsch et ak (K+ channels and disease) |
| Liman The nerve impulse and synaptic transmission Chapter 23.3 |
| Liman Cell Signaling I Chapter 15 |
| Liman Sensory Signaling I Chapter 23.4 |
| Liman Paper 2: Caterina et al (capsaicin receptor) |
| Liman Sensory Signaling II Chapter 23.4 |
| Liman Paper 3: Chang et al (sour taste I) |
| Liman Paper 4: Tu et al (sour taste II) |
| Liman Review |
| Midterm Examination |
| Arnold Techniques for Studying Cells Chapter 9  Eukaryotic Cell II |
| Arnold Secretory Pathway Chapter 12 |
| Arnold Secretory Pathway II Chapter 12 |
| Arnold Paper 1 Presley et al. |
| Spring Recess |
| Spring Recess |
| Arnold Insertion of Proteins into the ER Chapter 12  Membrane/Nuclear Import/Export |
| Arnold Paper 2 Kalderon et al |
| Arnold Protein Modifications/ Trafficking Signals Chapter 10 targeting of proteins |
| Arnold Paper 3 Folsch et al. |
| Arnold Receptor-mediated Endocytosis Chapter 13 |
| Arnold Vesicular Traffic/Synaptic Vesicles Chapter 13 |
| Arnold Paper 4 Weber et al. |
| Arnold Actin and Microtubules Chapter 16 |
| Arnold Paper 5 Lewis et al. |
| Arnold Kinesin and Myosin Chapter 16 |
| Final Examination 11:00 AM |