

## BISC 480 – Biology of Development (Spring 2014)

### Instructors:

Sergey Nuzhdin, Ph.D. (course chair)  
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### TA:

Meeting times:

**Lec 13046R 2:00-3:20pm Tu:RRI 221 Th:RRI221**  
Dis 13048R 3:30-4:20 Th: RRI 221

### Overview and Course:

#### Content:

The aim of this course is to introduce students to the advanced aspects of developmental biology, from the molecular level to the level of the cells, tissues, and organs, including:

- \* Fundamentals of gene regulation in developmental context
- \* Methods of manipulating developmental processes
- \* Systems biology
- \* Cell populations

#### Prerequisite:

Biological Sciences 220/221

#### Recommended preparation:

Biological Sciences 120 or 121, Introduction to Biology I

Biological Sciences 311 -or- 320, Molecular Biology

Biological Sciences 325, Genetics

Week	Date	Topic	Reading	Instructor	Discussion
1	Jan 14 Jan 16	Class Intro	Chapter 1	SN	Intro to fly genetics, collect virgins, cross, predict phenotypes.
2	Jan 19 Jan 21	Early Development I	Chapter 2a	SS	Observe larval behavioral abnormalities, describe them in light of knowledge of mutant development genes.
3	Jan 26 Jan 28	Early Development II	Chapter 2b	SS	Observe expression patterns with GFP knock-ins.
4	Feb 2 Feb 4	Vertebrate I	Chapter 3	SN	Cut cadavers at Medical Campus, Mike Habib and Biran Patel.
5	Feb 9 Feb 11	Vertebrate II	Chapter 4	SN	Visit Museum of Natural History, variation in mammal body plans, Xiaoming Wang.
6	Feb 16 Feb 18	Plant Development	Chapter 7		<b>Exam style MIDTERM 1</b>
7	Feb 23 Feb 25	Morphogenesis	Chapter 8	SS	Guest lecture, Andy McMahon, iPS cells and differentiation; induce cells.
8	Mar 1 Mar 3	Cell differentiation	Chapter 10	SS	Observe and explain differences in cell types, how this variety plays role in organogenesis.

9	Mar 8 Mar 10	Organogenesis I	Chapter 11	SN	Crab organ dissections in Museum of Natural History, Regina Wetzer.
	Mar 15-17	<b>SPRING BREAK</b>			
10	Mar 22 Mar 24	Organogenesis II	Chapter 11	SN	ask Le?
11	Mar 29 Mar 31	Evolutionary Development I	Chapter 15	SS	<b>Presentation style MIDTERM 2:</b> describe ideas of potential group projects.
12	Apr 5 Apr 7	Evolutionary Development II	Chapter 15	SS	group project, week 1
13	Apr 12 Apr 14	Regeneration	Chapter 14	SS	group project, week 2
14	Apr 19 Apr 21	Nervous system I	Chapter 12	SN	group project, week 3
15	Apr 26 Apr 28	Nervous system II	Chapter 12	SN	group project, week 4
	May ?	<b>FINAL EXAM Project Reports</b>			

Permission of instructor can be requested if you have not met the prerequisites. Familiarity with basic chemistry and physics is assumed. Facility with algebra is recommended.

Text: *Principles of Development*, Lewis Wolpert, Cheryll Tickle

Web Site: Course materials and announcements will be posted to Blackboard. You are responsible for checking the website.

Course E-mails will be sent only to your official USC email address.

Course Credit:

Midterm Exam 1 30% (chapters 1, 2, 3, 4)

Midterm Exam 2 30% (chapters 7, 8, 10, 11)

Final Exam 40% (20% chapters 12, 14, 15; 20% cumulative – presentations on background and research projects)

Discussion sections will be led by Teaching Assistants and will supplement and complement lectures. Some lectures and discussion sessions will be implemented as practical hands on wet lab exercises.

The syllabus may change slightly during the semester. Exam dates are firm.

Course Policies:

1) Exam dates are firm. There are no makeup exams in the course. Performance on the final may be prorated to substitute for a missing midterm exam, if an excuse considered valid by faculty is presented in a timely fashion. An acceptable written excuse or documentation must be provided to the faculty. The final exam will be administered only on the date and time set by the University.

2) Midterm exams will be returned to students by the TAs during discussion section. The final examination will not be returned but will be retained for one semester by the faculty.

3) Regrades: If you think an answer you have provided was graded incorrectly or if there is an arithmetic error, you may seek a regrade. You must provide a written explanation of why you think your answer was graded incorrectly. Regrade requests are to be submitted to your TA. If a regrade is agreed upon, then the ENTIRE EXAMINATION may be subject to a regrade. Your grade may therefore go up, go down, or remain the same. Regrade requests must be received within one week of when the exam key is posted for midterms, or by the second week of classes the following semester for the final exam.

4) No special assignments for extra credit are permitted.

5) Academic integrity policies of the University will be strictly followed. Infractions can result in severe penalties. There may be assigned seating for exams. No student may be admitted to an exam after the first student has left the exam.

Statement on academic integrity: USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles. Scampus, the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A: <http://www.usc.edu/dept/publications/SCAMPUS/gov/>. Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at: <http://www.usc.edu/student-affairs/SJACS/>.

6) Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to one of the Professors as early in the semester as possible. DSP is located in STU 301 and is open 8:30 AM – 5:00 PM, Monday thru Friday, Phone number: 213-740-0776.

7) It may be necessary to make adjustments to the syllabus during the semester. Check the course web site or class announcements on Blackboard for updates. **Exam dates will not be changed.**

8) Any questions or concerns regarding these policies should be addressed to the faculty.