

## BIOL 4554/5524: DEVELOPMENTAL BIOLOGY - SPRING 2009

### SYLLABUS

**Lectures:** TR 9:30-10:50 AM; SCEN 613

**Instructor:** Dr. Michael Lehmann  
**Office:** SCEN 621  
**Email:** mlehmann@uark.edu (please enter **DevBiol** as a **subject** of the message)  
**Office Hours:** see me immediately after class or by appointment  
**Course web site:** <http://comp.uark.edu/~mlehmann/courses.html>  
**Textbook web site:** <http://8e.devbio.com/>

**Text:** The required text for this course is *Scott F. Gilbert: Developmental Biology, 8th edition, Sinauer Associates*. The textbook comes with the vade mecum<sup>2</sup> CD, an interactive guide that contains plenty of useful information for the class. The CD also contains a manual in PDF format that covers some of the practical work that we will be doing in the lab section of this course. In addition, you have the option to acquire the Fly Cycle<sup>2</sup> CD-ROM, which features a movie covering fruit fly development and biology. Textbook and CD are available at the University bookstore.

**Objectives:** This course provides an introduction to both classical and modern Developmental Biology. Using primarily model organisms as examples, we will look at basic developmental processes and their regulation on an organismal, cellular and molecular level. By the end of this course you should be able to:

- describe basic principles of embryonic development common to multicellular organisms
- explain differences in developmental strategies that have evolved together with different groups of organisms
- give examples and explain the importance of postembryonic development
- describe modern approaches used in developmental genetics to dissect the molecular control of development
- give examples of molecular regulatory hierarchies that control development and explain how they work

It is expected that students have a solid basic knowledge in Genetics and Cell Biology, and have successfully attended the corresponding classes (Prerequisite: BIOL 2533 and BIOL 2323 or graduate standing).

**Lectures and labs:** You are expected to attend the lectures, and **lab attendance is mandatory**.

**Schedules** of both lectures and labs are **tentative**. In the lab we will depend on the timely availability of live material, and some flexibility will therefore be required. You may sometimes have to spend some extra time to finish an experiment or come in at odd times to exchange a solution, for instance. Changes in lecture topics, dates of exams, or specific reading assignments will be announced during class hours. Readings for each class period should be done prior to coming to class. The lectures are intended (1) to lead you through the vast amount of material covered in the textbook and to clarify the basic concepts presented therein, (2) focus your study time outside of class by providing specific learning objectives for selected topics, (3) provide a forum for student presentations, questions and class discussions.

**Student presentations:** Each graduate student is expected to give a 40-50 minute presentation based on an original research paper and be prepared to discuss the implications of the article and of related papers with the class. The presenting student will submit their presentation in writing according to the instructions given for minipapers (see below). Maximal extra credit for the presentation will be 10 points. Deductions may be made according to the criteria explained for minipapers.

**Minipapers (optional):** Each undergraduate student is free to turn in one minipaper for extra credit. Minipapers review and evaluate data from at least one original scientific publication from the field of Developmental Biology. In contrast to a review, an original publication contains the first description of experimen-

tal work that provides novel insight into an important biological process. If you are not sure that the publication(s) that you have chosen for your seminar fulfill this criterion, double-check with your instructor. Literature can be chosen from the references at the end of the textbook chapters. If you would like to review a paper not cited in the textbook, please consult your instructor first. The minipaper must have a length of at least two pages, but must not exceed 5 pages (references excluded, Arial, 11 point, single-spaced). It should include at least two references. The second reference can be a review or the textbook chapter(s) that you consulted to get additional background information about the topic addressed in the original paper. The outline should be similar to that of a scientific publication:

- Introduction (scientific background of the work and specific questions addressed in the paper)
- Principal method(s) used
- Main results
- Conclusions drawn by the author(s)
- Your evaluation (for instance, whether you think the data presented justify the conclusions drawn by the authors; whether you found reviewing the article rewarding, and why etc.)
- References (for proper format, see references in the textbook)

Ten **extra points** for the minipaper **will only be credited if form and content of the paper is satisfactory!** Points will be deducted for lack of factual accuracy or insufficient understanding of the topic, and also for an excess of orthographic mistakes and typos. Plagiarism/copying from sources will result in 0 points and may have more serious consequences (see Academic Honesty below). Please note that minipapers are only considered when submitted before the **deadline on Friday, May 1, 2009 (Dead Day)**.

**Exams:** There will be two non-comprehensive midterm exams (50 points each) and one final comprehensive exam (100 points). The second non-comprehensive exam may also include material covered prior to the first exam. The scheduled exams will be mixtures of short essay and multiple-choice questions. **Make-up exams** for midterm or the final exam will be given **only if you bring a physician's statement or equivalent document** explaining why you were unable to participate in the scheduled exam. Such make-ups will usually be oral. Final grades will be submitted to the Registrar's Office within 48 hours after posting on the course website. After that, final grades are final unless a clerical error has occurred.

**Lab credit:** You will get a maximum of 60 points for your performance in the lab, primarily based on your conduct in the lab, your laboratory notebook, and the Formal Laboratory Report that you are required to turn in (see Laboratory Program). Points may also be given for special assignments that will be announced during lab time.

**Grading:** The **final grade** will be determined as follows. Points earned in the three exams and the lab will be added up, and the average of the top three cumulative scores will be used as the 100% benchmark for grading. A normalized score of 90-100% will translate into a grade of A, 80-89% into B, 70-79% into C, 60-69% into D, and <60% into F. Extra credit will be added after this normalization procedure. Theoretically, this grading procedure makes it possible for every student in the class to receive an "A"!

#### **Academic Honesty:**

You are expected to familiarize yourself with the University of Arkansas' Academic Honesty Policy, published in the Catalog of Studies (Academic Regulations). Be aware that students who violate University standards of academic integrity are subject to disciplinary sanctions, including failure in the course and suspension from the University. Since dishonesty in any form harms the individual, other students and the University, policies concerning academic dishonesty will be strictly enforced!

**Disclaimer:** The information contained in this syllabus does not constitute a contractual agreement. Exam dates, format, course content and grading policy may be changed at the discretion of the instructor. Any changes will be announced during class period.