Developmental Biology
BIOL 4350(6350), Section A (4 credit hours)
Fall Semester 2012

Lecture (BC 2202): **M & W 3:30 pm – 4:45 pm**

Laboratory (BC 2071): **M 12:00 pm – 2:50 pm**

Instructor: Dr. Cristina Calestani
Office: BC 2085
Phone: (229) 333-7175
Email: ccalestani@valdosta.edu

Office hours:
Tuesday 10 am-12:15 pm
Wednesday 4:45 pm- 5:30 pm
Or by appointment (please send me an email to my valdosta.edu account with "appointment" in the subject line).

Pre-Requisites: BIOL 1107, BIOL 1108, and BIOL 3200 with a grade of C or better or permission of instructor.

Course Description: Study of gametogenesis and embryo development with an emphasis on the molecular, cellular and genetic mechanisms of selected model organisms. The course will include medical aspects of developmental biology and developmental mechanisms of evolutionary change.

Course Objectives

The students will be able to:
1) Describe the developmental anatomy of selected invertebrate and vertebrate embryos of model organisms
2) Comprehend the basic molecular and cellular mechanisms of fertilization and embryo development
3) Compare and contrast development of different model organisms
4) Understand experimental approaches used to answer specific questions in developmental biology
5) Develop and test a hypothesis using experimental embryology techniques learned in the laboratory
6) Analyze and interpret experimental data in developmental biology
7) Communicate scientific results and evaluate their significance in the context of current knowledge in developmental biology
8) Discuss ethical implications and societal impacts of advances in developmental biology research

Textbook
Scott F. Gilbert. 2010. *Developmental Biology* 9th ed. Sinauer Associate, Inc., Massachusetts USA.

Laboratory Manual
Mary S. Tyler & Ronal N. Kozlowski. 2010. *DevBio Laboratory: vade mecum 3*. An Interactive Guide to Developmental Biology (online access). To download the manual register at: http://labs.devbio.com using the code printed inside the cover of the textbook.

Additional material for the lab will be posted on Blazeview.

ASSESSMENTS

Lecture
The lecture assessments will consist of four exams. The fourth exam will be a comprehensive final.
Exams will be taken during class time and must be turned in by the scheduled end of class.

Photo identification is required for all exams.

Exams grades will be posted on Blazeview.

- All exams are based on lecture material and assigned readings.
  If you do not attend class on a regular basis you will be at a significant disadvantage.

- Exams questions are multiple choice, true/false, matching and some short written answers.

- If you fail to attend one of the exams for any reason, you must provide documented evidence (e.g. from doctor, police, etc.) that circumstances beyond your control prevented you from taking the exam. Failure to provide reasonable evidence will result in a grade of 0 for the exam. Makeup exams will be administered at any time during the semester at the discretion of the instructor.

- If you arrive late for an exam you will be allowed to take the exam. However, you must turn in the exam paper at the regular scheduled end of the class. You will not be allowed extra time unless a documentable emergency has occurred.

- The final exam grade (exam 4) can replace the lowest grade of exams 1, 2 or 3. This applies only to exam 4; no other exam can replace the lowest grade. If exam 4 is used to replace a lower grade in tests 1, 2, or 3, the grade for exam 4 will count twice in the final grade calculation. Exam 4 cannot be used to replace a missed test.

- Exam 4 will always count in calculating the final grade.

- After each exam, students are strongly encouraged to review it. You can review an exam during office hours. Exams papers will not be returned to students.

- **Any student attempting to copy, take pictures or steal a hard-copy of a test, at any time during the semester, will receive an automatic F for the entire course and face disciplinary action for student misconduct.**

Laboratory

The laboratory assessments consist of two practical exams and 3 powerpoint presentations of inquiry-based experiments. Students are required to maintain a laboratory notebook.

The practical exams questions may include microscope slides, whole specimens and a written component.

The inquiry-based experiments will be performed in groups of approximately four students. Time outside of the assigned laboratory hours is required for the inquiry-based experiments. Your final grade for the presentations will be influenced by peer evaluation of your relative level of contribution; *i.e.* your group partners will grade your contribution on a scale of 0-100%. For example, if your group lab presentation receives a grade of 100% by the instructor and your partners estimate your effort to be 60% (as compared to other members of the group) your lab presentation grade will be 60% of 10 points. An average taken from all members of the group will be used to calculate the percent effort for each person. Peer assessment will be anonymous.

There are no make-up labs. Attendance for the laboratory is mandatory. Attendance will be recorded at the beginning of each laboratory. Students arriving after the first 30 minutes of the laboratory will be considered absent. Any student missing 3 laboratories or more, with or without documented excuse, cannot receive a lab grade above a "D" (60%).

Extra-credit up to a maximum of 10 points will be offered. These points will be added to the student total points for the course before calculating the percentage grade. Extra-credit points can be earned with in-class activities during the lecture or the laboratory, or with take-home assignments.

Grade Calculation*		
Assessment		**Max. Points**
Lecture	Exam 1	100
	Exam 2	100
	Exam 3	100
	Final Exam	100
Laboratory	Practical 1	50
	Practical 2	50
	Oral presentation 1	10
	Oral presentation 2	10
	Oral presentation 3	10
Total Max. Points		**530**
Extra-credit max. Points		**10**

Grade Distribution	
Letter	**Percentage**
A	90 -100%
B	80 - 89%
C	70 - 79%
D	60 - 69%
F	≤ 60%

***Final grade calculation: (Lecture exams + Lab practicals + Lab presentations + extra-credits)/530**

NOTE: Graduate students enrolled in BIOL 6350 will have additional assignments and adjusted grading scale in a supplementary syllabus.

Classroom Accommodations
Students requesting classroom accommodations or modifications due to a documented disability must contact the Access Office for Students with Disabilities located in Farber Hall. The phone numbers are 245-2498 (V/VP) and 219-1348 (TTY). For VSU's Access Office please see http://www.valdosta.edu/access/facresources.shtml

Behavior in the Classroom
It is assumed that all students will act in a mature manner in the classroom, showing consideration for their peers and the instructor. Any student who consistently distracts other students or the instructor will be removed from the course. **All electronic devices must be turned off or set to silent mode in the classroom.**

Cheating or Plagiarism
Incidents of cheating or plagiarism will result in **an automatic F for the course and referral to The Office of Student Conduct for disciplinary action.** For VSU's Academic Integrity Code please see http://www.valdosta.edu/academic/AcademicHonestyPoliciesandProcedures.shtml.
For VSU's Academic Honesty please see http://www.valdosta.edu/academic/AcademicHonestyatVSU.shtml.

Learning Support
 The Student Success Center: The Student Success Center (SSC) provides free peer tutoring in core courses, the top four of which are math, writing, Spanish, and biology/chemistry. It also offers time management and study skills workshops as well as provides free professional academic advising and on-campus job information in one location: Langdale Residence Hall. Help is available to all VSU students. Call 333-7570 to make an appointment, or visit the website: www.valdosta.edu/ssc.
 Odum Library provides a variety of services to assist classroom instruction, including library instruction, course reserves, and interlibrary loan. Please see http://www.valdosta.edu/library/services/faculty.shtml for further information.

TENTATIVE LECTURE OUTLINE:

Lecture	Date	Topic	Text Reading
1	Aug 13	**Course Introduction**	Part I: pg. 1-4
2	Aug. 15	**Developmental Anatomy**	Chapter 1
3	Aug. 20	**Fertilization**	Chapter 4
4	Aug. 22	**Developmental Genetics I**	Chapter 2
5	Aug. 27	**Developmental Genetics II**	Chapter 2
6	Aug. 29	**Cell-Cell Communication I**	Chapter 3
--	Sept. 3	**LABOR DAY HOLIDAY**	
7	Sept. 5	**Cell-Cell Communication II**	Chapter 3
8	Sept. 10	**Introduction to Specification and early development**	Part II pp. 109-119
9	Sept. 12	**Early Development in Invertebrates**	Chapter 5
--	Sept. 17	**EXAM # 1**	**Lecture material 1-8**
10	Sept. 19	**Body Axis Specification**-Drosophila	Chapter 6
11	Sept. 24	**Vertebrate Early Development:** Birds	Chapter 8
12	Sept. 26	**Vertebrate Early Development:** Mammals	Chapter 8
13	Oct. 1	**Vertebrate Early Development:** Amphibians and Fish	Chapter 7
14	Oct. 3	**The Stem Cell Concept**	Part III: pg. 323-331
--	Oct. 4	**Midterm- last day to drop without penalty**	**--**
15	Oct 8	**Tissue Regeneration**	Chapter 15 pp. 560-571 Chapter 17 pp.649-655
16	Oct. 10	**Late Development-Organogenesis I** Central Nervous System	Chapter 9
--	Oct. 15	**FALL BREAK**	--
17	Oct. 17	**EXAM #2**	**Lecture material 9-15**
18	Oct. 22	**Late Development-Organogenesis II** Derivatives of the Neural Crest Cells	Chapter 10
--	Oct. 24	**CANCELLED**	
19	Oct. 29	**Late Development-Organogenesis III** Derivatives of the Paraxial & Intermediate Mesoderm	Chapter 11
20	Oct. 31	**Late Development-Organogenesis IV** Derivatives of the Lateral Plate Mesoderm and the Endoderm	Chapter 12
21	Nov. 05	**Sex Determination**	Chapter 14
22	Nov. 07	**The Germ Line I**	Chapter 16
23	Nov. 12	**The Germ Line II**	Chapter 16
24	Nov. 14	**TEST # 3**	**Lecture material 18-23**
--	Nov. 19	**Medical Aspects I**	Chapter 17 pp.625-646
--	Nov. 21	**THANKSGIVING HOLIDAY**	--
25	Nov. 26	**Medical Aspects II**	Chapter 17 pp.625-646
26	Nov. 28	**Developmental Mechanisms of Evolution**	Chapter 19
	Dec. 03	**Review**	
	Dec. 05	**FINAL EXAM**	**Cumulative (1-26)**

TENTATIVE LABORATORY EXERCISES:

Lab	Day:	Topic:	Text / Other
1	Aug 13	Laboratory Introduction	--
2	Aug. 20	Amphibian Development	Chapter 14
3	Aug. 27	Sea Urchin Fertilization	Chapter 6
--	Sept. 3	**LABOR DAY HOLIDAY**	
4	Sept. 10	Effects of UV radiation (inquiry-based experiment)	Chapter 7
5	Sept. 17	Early Chicken Development	Chapter 9
6	Sept. 24	**Oral presentation 1** (Effects of UV)	
--	Oct. 1	**Practical Exam 1**	
--	Oct. 4	**Midterm- last day to drop without penalty**	
8	Oct 8	Mid Chicken Development (33 hrs p.f.)	Chapter 10
--	Oct. 15	**FALL BREAK**	
9	Oct. 22	Regeneration in Planaria (inquiry-based experiment)	Chapter 13
10	Oct. 29	Teratogens effects in Salamander (inquiry-based experiment)	Handout
11	Nov. 05	Gametogenesis	Chapter 5
12	Nov. 12	**Oral presentation 2** (Regeneration)	
13	Nov. 19	**Oral presentation 3** (Teratogens)	--
--	Nov. 26	**Practical Exam 2**	--
--	Dec 03	Review for Final (in BC 2202)	--