Moravian College
Department of Biological Sciences
DEVELOPMENTAL BIOLOGY --- Biology 390
Spring 2012

Instructor: Dr. Fran Irish **Office Phone**: 610-861-1427
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Office hours: Monday and Friday 9:50 a.m. – 11:30 a.m.,
Monday 1:00 pm - 2:30 pm

Instructor: Dr. Christopher Jones **Office Phone:** 610-861-1614
e-mail: cjones@moravian.edu **Office:** CHOS 310
Office hours: Thursday 11:00 am - noon

Required textbook: *Developmental Biology, 9th. edition,* by Scott F. Gilbert

Course description: *Development* is the process by which multicellular organisms increase in complexity as they grow from single cell to adult. By considering classical embryology and recent advances in cellular and molecular biology, we will take up the most interesting questions of developmental biology, including how individual cells "know" where they are in the developing animal, similarities and differences in developmental processes, how an organism self-corrects developmental mistakes, and the role of development in evolution. Topics include fertilization, regulatory genetic cascades, cell-fate determination, emergence of complex organ systems, and handedness in organisms from slime molds to vertebrates. Prerequisites: Biology 112 and 210

Course objectives:
By the end of the course, you should:

1. Be familiar with the vocabulary of modern developmental biology and be confident in your own use of it.
2. Be introduced to and experienced with many of the methods used by developmental biologists.
3. Know the sequence of developmental events from fertilization through organogenesis in a variety of animal groups.
4. Be familiar with our current understanding of the genetic mechanisms driving this sequence of events.

Blackboard: All information associated with this course will be posted on Blackboard. You must register yourself (preferably soon)---your opportunity to register will expire on Monday, January 23rd.. If you don't already know how, see the following link:
http://home.moravian.edu/public/cit/_help/blackboard/bbstudent.asp
The course ID is BIOL390.SP12 and there is no enrollment code. If you have difficulty with this, PLEASE E-MAIL ONE OF US IMMEDIATELY!

Policy on electronic devices: Cell phones must be turned off during lecture (this means you cannot text your friends). We do not encourage the use of laptops in class, as the

temptation to play games, converse with friends, etc., appears to be irresistible, and is disruptive for those around you. If you feel it is vital to bring a laptop to take notes, you must: 1. Convince us it is necessary. 2. Sit in the front of the class. 3. Take notes.

Lecture attendance: Strongly advised. Prof. Irish's lectures will generally be in the form of PowerPoint presentations, which will be posted on Blackboard after class. Please note that the power point slides are really an outline of what will be said in lecture—you will still need to attend the lectures and take notes if you are to learn the material.

Prof. Jones hasn't tended to use PowerPoint as much, though that may change with this course. Regardless, class time is the best time to get questions answered, and if you're not there, well, that whole question-answering thing sort of goes out the proverbial window, doesn't it?

Reading assignments: You have a well-written, up-to-date textbook; unfortunately, we will not have time to discuss everything in it. The pages that are relevant to each lecture are indicated on the lecture syllabus. We expect you to scan the relevant pages BEFORE each lecture to get a feel for the material that will be covered. After class, read the sections covered in the lecture more carefully, and amplify your lecture notes in areas you don't understand. There is an excellent snap-shot summary at the end of each chapter. Though not included in the reading assignments, we suggest that you take advantage of them. The textbook also provides access to a wide array of online resources, including movies, a glossary, study questions, etc. If you purchased your textbook, you should have an access code for these materials.

Presentations and paper: Working in pairs, you will be required to give one 15-minute presentation on an article of your choice from the primary literature of developmental biology. Each student will also write a 5-page paper, due on the last day of class. The paper can be on the same topic as the presentation (or not), but should be a synthesis of information drawn from more than one article and should not focus on the same article as the presentation. (Although you and your partner will be using the same articles for your presentation, you should ***NOT*** each use the same article for your papers.)

Grading: Your grade will be more or less evenly divided between the labs and the lectures. Your scores for all assignments and exams will be posted on Blackboard, so you can see how you are doing at any time (check the percentage in the "total points" column). There will be no extra credit options, so please focus your energy on what we are doing in class and lab.

3 short lecture exams (½-hour) — 50 points each
Final exam — 200 points
Lab write-ups — 50 to 100 points each, depending on format
Presentation — 100 points
Paper — 100 points

There may be a few miscellaneous assignments as well over the course of the semester; if so, we will announce the specifics about them then.

Policy on honesty: Students are expected to abide by the college policy on intellectual honesty (see Student Handbook < http://www.moravian.edu/studentlife/handbook/academic/academic2.html>).

Disability support: Students who wish to request accommodations in this class for a disability should contact Mr. Joe Kempfer, Assistant Director of Learning Services for Disability Support, 1307 Main Street (extension 1510). Accommodations cannot be provided until authorization is received from the office of Learning Services.

BIO390 (Development) Spring 2012

Lecture: TR 8:55 – 10:05 am Profs. Irish & Jones

Laboratory: W 1:15 – 4:15 pm

date	topic	reading	other items
Tues., Jan. 17	course overview, developmental anatomy I		
Thurs., Jan. 19	developmental anatomy II	chapter 1	
Tues., Jan. 24	gene structure & transcription	ch. 2, pp. 31-52	
Thurs., Jan. 26	RNA processing & translational control	ch. 2, pp. 53-66	
Tues., Jan. 31	cell adhesion, migration, & signalling	ch. 3, pp. 69-84	
Thurs., Feb. 2	paracrine, juxtacrine, & extracellular matrix	ch. 3, pp. 84-105	
Tues., Feb. 7	specification	pp. 109-119	exam 1
Thurs., Feb. 9	fertilization	chapter 4	
Tues., Feb. 14	Drosophila development	chapter 6	
Thurs., Feb. 16	invertebrate development	chapter 5	
Tues., Feb. 21	amphibian development	ch. 7, pp. 241-272	
Thurs., Feb. 23	fish & bird development	ch. 7, pp. 273-283; ch. 8, pp. 287-300	deadline for article choice
Tues., Feb. 28	mammalian development	ch. 8, pp. 300-321	
Thurs., Mar. 1	stem cells	pp. 323-331	exam 2
Tues., Mar. 6	SPRING BREAK		
Thurs., Mar. 8	SPRING BREAK		
Tues., Mar. 13	CNS, brain, & eye development	ch. 9, pp. 333-365	faculty article presentation
Thurs., Mar. 15	the neural crest	ch. 10, pp. 373-392	
Tues., Mar. 20	epidermis, neuronal specification, & axonal specificity	ch. 9, pp. 365-370; ch. 10, pp. 392-409	student article presentation

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Laboratory Syllabus

date	topic
Wed., Jan. 18	Introduction, toolmaking
Wed., Jan. 25	Microscopy, gametogenesis
Wed., Feb. 1	*Dictyostelium discoidium*
Wed., Feb. 8	*Drosophila melanogaster* development I
Wed., Feb. 15	*Drosophila melanogaster* development II
Wed., Feb. 22	*Drosophila melanogaster* development III
Wed., Feb. 29	*Gallus domesticus* development I
Wed., Mar. 7	SPRING BREAK
Wed., Mar. 14	*Gallus domesticus* development II
Wed., Mar. 21	*Gallus domesticus* development III
Wed., Mar. 28	Amphibian development
Wed., Apr. 4	Planaria regeneration
Wed., Apr. 11	*Danio rerio* development I
Wed., Apr. 18	*Danio rerio* development II
Wed., Apr. 25	