Vertebrate Embryology – ZOOL 320

Instructor: Victoria Livingston
Office Hours: M & W 11-12; 3-4
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Waggoner 327. 298-2771

*~* I am also available by appointment, or if my door is open! Stop and check!! *~*

Location: Lecture – MW 9:00 – 9:50 am Rm 202
Labs – Th 8-9:50 am Rm 324
Th 10-11:50 am

Catalog Description: Development of the vertebrate body and its organs. Provides a basis for understanding adult anatomy.

Expanded Description: This course focuses on vertebrate evolutionary development (EvoDevo in modern usage). We examine the evolutionary relationships of vertebrates by comparing and contrasting their embryonic development. We touch on issues related to stem cell research and cloning, and perform IACUC (Institutional Animal Care and Use Committee) approved experiments on vertebrate embryos. These experiments investigate reproduction and the impact of environmental factors on vertebrate development. Human medical embryology and birth defects are briefly considered, but this is not a course on human development.

Prerequisites: Two of the following: BOT 200, MICR 200, ZOOL 200

Required Materials:
Text

CD-ROM
Tyler, M. S., and Kozlowski, R. N. 2010. DevBio Lab: Vade Mecum³. http://labs.devbio.com/ The lab manual is included in at this site Adobe Acrobat format. You will purchase an access code that will allow you to use the animations, movies, study guides, and lab manual at this site.

Course Objectives
On completion of this course, the student shall be able to:
1. Think like a developmental biologist.
2. Describe and explain the embryonic origins of major adult structures in vertebrates.
3. Describe and explain the genetic and cellular underpinnings of vertebrate development.
4. Understand the universalities of vertebrate development and its implications for evolution.
5. Understand the practical ramifications of vertebrate development for humans and society.
Student Responsibilities
1. Reading and taking responsibility for all assignments, policies, and expectations presented in this syllabus.
2. All material covered in lecture and lab, including additional material not covered in your text or in on-line goals.
3. Reading all assigned text and laboratory assignments prior to lecture or lab.
4. Attending lab and actively participating in laboratory work and assignments.
5. Being prepared for class and lab discussion.
6. Having access to university computers for WesternOnline, downloading lecture goals, course information, and using the DevBio Vade Mecum³ site (http://labs.devbio.com/) which contains your lab manual and animations required for viewing.
7. Taking exams on the day they are given.
8. Completing assignments by their due dates.
10. Asking the professor for help and utilizing the professor’s office hours for assistance.

Materials You Will Need For This Course
1. You must purchase a package of note cards for vocabulary quizzes.
2. A loose-leaf laboratory notebook – it needs to be loose-leaf because I will collect laboratory notes from you throughout the course for grading.
3. Colored pencils – the colors blue, red, yellow, and green will be most important for our purposes. These should be used during lecture and lab to color code embryonic development. You will want these as soon as possible.
4. Closed-toed shoes – after the first lab, no one will be allowed into lab without closed-toed shoes. This rule is to protect your feet from chemical spills, broken glass, etc.

Attendance
Attending lecture and lab in a course such as this is necessary to understand complex anatomical material and concepts. You are all adults and I will not directly track your attendance (but see participation and discussion grades below). However, your performance in this course will be adversely affected if you do not show up regularly. Students with poor attendance always and without exception do very poorly in this course.

I do not supply notes to students who missed class.

Calendar of Readings & Labs Posted On-line
The Calendar of Readings & Labs which includes exam dates is available on-line at Western Online which requires you to access it by password and be registered for the course (see below).

I will attempt to follow the schedule posted in the on-line calendar to the best of my ability, but this is not always possible. Sometimes we go slower or faster in our coverage of material depending on student needs or unforeseen events and class cancellations. The Calendar of Readings & Labs is therefore tentative and subject to change as I see fit – all changes will be announced on-line and in class, and posted accordingly.

It is expected that you come to lecture and labs prepared, having read the assigned readings or watched the outside viewings for that day in advance.
I do not tolerate excuses related to not knowing what is scheduled for a particular class or lab period. It is your responsibility to keep up to date on the assigned readings, labs, and outside viewings of podcasts.

**WesternOnline**
The exams and copies of handouts in this course are available on-line via WesternOnline. You must become familiar with the WesternOnline site. If you have questions or problems regarding the functions of WesternOnline, contact one of the Academic Computing Resource Centers on Campus. These are located in the student union and Stipes 126. Directions for accessing course material on WesternOnline are published at: [http://westernonline.wiu.edu/](http://westernonline.wiu.edu/)

It is not acceptable to remain ignorant of WesternOnline – you are required to use it and I will not tolerate excuses related to not being familiar with, or having problems with, WesternOnline. Keep up with the current postings and timeframe on WesternOnline. Once something closes, I’m not going to open it again. If something happens to your personal computer, you would be well advised to get to the library and finish your work. If your computer has problems with WesternOnline, I strongly suggest you use the library or a staffed computer lab, so if there is a major problem, you have a 3rd party to verify and fix it.

**Using the DevBio Labs Vade Mecum³ Website**
The Vade Mecum³ website a wonderful tool for understanding embryo development in three dimensions. There are many excellent pictures and movies of embryo development, and your lab manual is also included in Adobe Acrobat format. You are expected to have access to university computers to view the appropriate pictures and animations, and to read and/or print out relevant lab materials (see the calendar of readings and labs at the end of the syllabus).

I expect that prior to every lab you will have viewed the appropriate Vade Mecum³ visuals – these will be extremely helpful in understanding the lab and details included in the animations are fair game for quiz and exam questions. Because the Vade Mecum³ site uses sound, please be respectful of others if you use this in a public lab – use headphones or turn off the sound.

**Academic Dishonesty**
At Western Illinois University, cheating is a violation of official university policy. Cheating, plagiarism, and other forms of academic dishonesty will not be tolerated in this course. Should you have any doubt as to what constitutes academic dishonesty, please consult the Official University Policy ([http://www.wiu.edu/policies/acintegrity.php](http://www.wiu.edu/policies/acintegrity.php)). Ignorance of university policies on academic dishonesty does not exempt a student from the penalties. Students will be held to Official University Policy ([http://www.wiu.edu/policies/acintegrity.php](http://www.wiu.edu/policies/acintegrity.php)) in relation to these matters, and are responsible for understanding and following it. If the need for a grade appeal arises, we will follow university procedure: [http://www.wiu.edu/policies/gradeapp.php](http://www.wiu.edu/policies/gradeapp.php)

**Statement on Cheating**
Cheating will not be tolerated in this course. Copying another student’s quiz or exam, or collaborating with one or more students to cheat on quizzes or exams, will result in the following penalties:

1. First offense: zero for the quiz or exam.
2. Second offense: failure of the course and academic dishonesty related discipline.

*This includes those individuals who allow others to copy from their work! Anyone involved will be subject to these penalties.*


**Course Grading**

**Lecture Examinations**  350 Points
All students will take three (3) lecture examinations worth 100 points each, and a semi-cumulative final exam worth 150 points (100 points from new material, 50 points review material). The lowest of the first three exam scores will be dropped. Therefore, your score for the first three exams will correspond to the best two of three. The final exam is required of all students.

Each exam will consist of a combination of multiple-choice and matching questions that are based on text reading assignments, discussions in lab, and material presented in lectures. This includes presented material not available in the book, supplemental readings, or in the on-line goals! It is every student’s responsibility to be prepared for these exams by attending every lecture. It is also every student’s responsibility to find out what they missed during lectures for which they were absent (but see attendance policy above).

**Exam Procedures**
All lecture exams, including the final, will be given through the WesternOnline site for our course. Each exam will be posted to WesternOnline for 48 hours at times specified by me throughout the semester. The questions are randomized and each student will receive a randomly selected set of questions. The exams are open book and open note, but you will only have 90 minutes to complete them. When you submit your exam, it will be graded and returned to you via WesternOnline – please allow at least one week for grading and results to be posted. Everyone has to take the exam, and some questions will need to be reviewed by me before I can get them back to you. You’ll get them back as soon as I am able.

Find out now if there are any scheduling conflicts with the Final Exam and come see me ASAP if there are. Without appropriate documentation, I cannot let you take the final at another time. The university sets the final exam date: **December 11, 2013 at 8 am** (ours will run for 48 hours on-line from that date – it will turn off Friday December 14th at 8 am).

**Lab Practical**  200 Points – September 16, and October 7, 2013
Two major lab practicals will be given during the course of the semester. The lab practical is fill-in-the-blank format, and will consist of 50 questions and 2 or more bonus questions. The purpose of the lab practical is to hone the embryological identification and anatomical skills of students both for better understanding the course material and in preparation for the zebrafish labs.

The lab practical is required of all students. Students cannot skip or miss this exam for any reason except extended hospital stay (two or more days in the hospital) or death in the immediate family. Appropriate documentation is required for an excuse to be valid, and a different exam must be taken by the student within one week of the lab practical.

It is every student’s responsibility to be prepared for the lab practical by attending all labs (see attendance policy above).

**Missed Exams Policy**
The first three exams cannot be made up for any reason. This is because you can drop your lowest exam grade for the first three.

If you miss the final exam, you will fail this course. Unless extreme circumstances exist (death in the immediate family or hospitalization that lasts two or more days), a missed final exam cannot be re-taken or
made-up. An alternative make-up final exam will be available to students with excused absences. Make-up final exams must be completed within one week of the original exam. If the missed exam is not completed in this time period, the student will fail the course. The make-up final will be essay.

**Participation**

All students are expected to participate actively in this course by engaging themselves in the lecture and lab material, and by contributing constructively to discussions led by the instructor. The participation grade is based on the following activities:

**Vocabulary-of-the-Day Quizzes** 100 Points

Approximately thirty (30) Vocabulary-of-the-Day quizzes will be given throughout the course of the semester worth 5 points each. Each quiz will be given at the beginning of most class meetings – students will write an embryology word from the day’s assigned reading with correct spelling and write a short statement about its anatomical importance. Points are assigned based on spelling (2) and content (3). The top 20 vocabulary quiz scores at the end of the semester will be added for the final quiz score (20 X 5 = 100). The remaining quizzes will be dropped. Missed quizzes cannot be made up for any reason.

**In-lab Exercises & Lab Questions** 100 Points

Throughout the semester (where indicated in the readings calendar) you will be required to watch certain Vade Mecum videos / sequences prior to lab, and/or read over pertinent information in the on-line lab manual. These outside viewings will form the basis of graded exercises in various labs. I will provide more details in class for each of these exercises.

**In-lab Zebrafish Exercises** 150 Points

During the last half of the semester, there will be in-lab exercises involving the observation of normal and experimental zebrafish embryos. Part of the grade for these in-lab exercises will consist of a written portion as well as oral discussion. Lab notes taken during these exercises will also be collected and graded. More information will be provided in separate handouts for these times.

**Oral Report of Results** 100 points

At the end of the semester, all students will give brief oral reports on their zebrafish experiments. More information will be provided in separate handouts for these times.

**How Grades Are Determined**

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
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<tbody>
<tr>
<td>3 Lecture Exams (Best 2 of 3)</td>
<td>200</td>
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<tr>
<td>1 Final Exam</td>
<td>150</td>
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<tr>
<td>Quizzes (Best 20)</td>
<td>100</td>
</tr>
<tr>
<td>2 Lab Practicals</td>
<td>200</td>
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<tr>
<td>In-lab Exercises &amp; Lab Questions</td>
<td>100</td>
</tr>
<tr>
<td>Zebrafish Exercises</td>
<td>150</td>
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<tr>
<td>Zebrafish Oral Report</td>
<td>100</td>
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<tr>
<td>Total Points</td>
<td>1000</td>
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Grading Scale:

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<tr>
<th>Score Range</th>
<th>Letter Grade</th>
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<tbody>
<tr>
<td>94-100</td>
<td>A</td>
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<tr>
<td>90-93</td>
<td>A-</td>
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<td>87-89</td>
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<td>70-73</td>
<td>C-</td>
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67-69 = D+ 64-66 = D 60-63 = D-
Anything below 60 is failing.

I do round at .5  Grades will be made available to you prior to midterms and the final exam. You are welcome to contact me about your grade at any point throughout the semester.

I don’t like late work. You get 1 week with a reasonable excuse for not handing it in, unless circumstances are such that I am willing to give you more time. Work will lose 10% of the grade if turned in late. If past 1 week, it will not be accepted and receive a zero.

Extra Credit
You have the opportunity to earn 1000 points in this course from a wide variety of activities (exams, quizzes, lab reports) spread over the semester. Therefore, I will not offer extra credit assignments – the grade you earn corresponds to the points you accumulate. Please do not ask for extra credit assignments – none will be given.

Students with Disabilities
“In accordance with University policy and the Americans with Disabilities Act (ADA), academic accommodations may be made for any student who notifies the instructor of the need for an accommodation. It is imperative that you take the initiative to bring such needs to the instructor’s attention, as he/she is not legally permitted to inquire about such particular needs of students. Students who may require special assistance in emergency evacuations (i.e., fire, tornado, etc.) should contact the instructor as to the most appropriate procedures to follow in such an emergency. Contact Disability Support Services at 298-2512 for additional services.” See also: http://dss.wiu.edu/

Misc. Details
1. Email is the best way to get in touch with me, and I check both my regular WIU email as well as Western Online frequently. If you can’t email, you can call me or leave a message with the Biology office.
2. Electronics – you don’t need them. We’re not here that long.
3. Food & drink – Please make it something with a lid. If you can be clean, I don’t mind the stuff in the room. For lab, do NOT expect to eat or drink in that room. Drinks may be left outside the room, and you can excuse yourself if you need one. Consider all the nasty things that get set on that lab bench, and then think about putting it in your mouth. Don’t do it.
4. Gum – Same as food and drink – Lecture it’s okay, as long as I’m not hearing you chew. Lab – No.
This syllabus is a written contract between you and the professor. By signing this sheet from the last page of your syllabus, you agree to abide by the policies presented herein. Failure to sign and turn in this sheet to your professor will result in a grade of “Incomplete” until it is received.

I, _______________________________________________, have read this syllabus and agree to follow its policies. I also agree to be held accountable to the university policies on academic dishonesty and student conduct. I realize that ignorance of the policies outlined in this syllabus and/or those of the university do not exempt me from disciplinary action if I should violate them. My signature below indicates that I understand and will follow these policies.

______________________________________________________________________________

Student Signature

___________________________
Date received by Mrs. Livingston