

BIOL 4464: DEVELOPMENTAL BIOLOGY

FALL 2008

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TEACHING ASSISTANT: Charlotte Wiest
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TIME AND LOCATION: MWF 11:05 TO 11:55 AM, ES&T, L1205

TEXT: *Developmental Biology*, 8th Edition
By: Scott F. Gilbert, Sinauer Associates, Inc.
Lectures (PowerPoint) and PDF files of journal articles are available on *t-square*.

OFFICE HOURS: No regular office hours are scheduled; however students are STRONGLY encouraged to meet with the instructor and/or TA when needed by arranging a time via email.

COURSE DESCRIPTION: The goal of this course is to introduce you to the very broad field of developmental biology. A particular emphasis is on the connection between mechanisms of normal development and disease etiology, which will be a theme throughout the course. Additional emphasis is the intimate connection between developmental biology and evolution. Both invertebrate and vertebrate model organisms will be covered, including *Drosophila*, *C. elegans*, *Xenopus*, chick, zebrafish, and mice. Another emphasis of the course is to teach you how to experimentally approach the topics of development. Students will become familiar with cutting edge molecular, genetic and imaging techniques that are applicable to analysis of many aspects of development. The course will be divided into multiple topics, each of which will be covered by lectures and discussion of research papers. Groups of students will be responsible for leading discussion of research papers. Instruction on how to structure these discussions will be given.

IMPORTANT DATES:

Mon	AUG 18 th	CLASSES BEGIN
Mon	SEP 1 st	OFFICIAL SCHOOL HOLIDAY
Mon-Tue	OCT 13-14 th	FALL BREAK
Fri	OCT 10 th	Last day to WITHDRAW from course with a "W"
Sun	OCT 26 th	Last day to WITHDRAW from school with "W" grades
Wed-Tue	OCT 29 th -NOV 11 th	Phase I Registration for Spring Term 2008
Thu-Fri	NOV 27-28 th	OFFICIAL SCHOOL HOLIDAY
Fri	DEC 5 th	LAST DAY OF CLASSES
Mon-Fri	DEC 8-12 th	FINALS WEEK
Fri	DEC 12 th	FINAL EXAM (2:50 - 5:40)

Sat

DEC 13th

FALL COMMENCEMENT

EVALUATION CRITERIA:

Exams: 60%

There will be THREE lecture exams and a CUMULATIVE FINAL exam. All lecture exams will consist of short-answer questions and the lowest exam grade will be dropped. **NO Make-up exams will be given.**

Group Presentations: 20%

Groups of 5 - 6 students will give an oral PowerPoint presentation on a journal article related to development. The presentations should address the following areas:

- introduction to topic/what prompted research
- experimental approaches - why techniques used/limitations/advantages
- results
- conclusions
- future research directions
- therapeutic implications
- summary
- critique of data & conclusions

Quizzes: 20%

Unannounced in-class quizzes will be given on information covered in lectures.

HONOR CODE:

All students are required to adhere to the Georgia Tech Academic Honor Code (www.honor.gatech.edu). This includes, but is not limited to, the following issues that pertain to the oral presentations, written critiques, and exams. Unless specifically identified as "group work"; quizzes, tests, take-home-tests, homework, etc. are to be completed alone. Cheating off of another person's exam or quiz is unacceptable, in direct violation of the GT Academic Honor Code, and will be dealt with accordingly. Plagiarism (to steal and pass off the ideas or words of another as one's own or use another's production without crediting the source) is **not** allowed. For group oral presentations, students may collaborate in all aspects of the work. It is expected that all will contribute equally to the final product and that they will share the single grade that is awarded for the PowerPoint presentation. Students may use copyrighted figures, etc. from publications in the presentation if appropriate citations are given because they will only be posted on the access restricted *t-square* website. Students are encouraged to collaborate in some aspects of the preparation of written critiques, such as the early stages where you are achieving an understanding of the assigned papers; however, the final critiques must be written alone. **For any questions involving these or any other Academic Honor Code issues, please consult Dr Sewer, Charlotte Wiest (teaching assistant), or www.honor.gatech.edu.**

LECTURE SCHEDULE

<u>DAY</u>	<u>DATE</u>	<u>TOPIC</u>	<u>READING</u>
MON	AUG 18	Overview of Model Organisms & Regulatory Mechanisms	CH 1
WED	AUG 20	Fertilization	CH 7
FRI	AUG 22	Fertilization	CH 7
MON	AUG 25	Fertilization	CH 7
WED	AUG 27	Early development in sea urchins	CH 8
FRI	AUG 29	Early development in <i>C. elegans</i>	CH 8
MON	SEP 1	OFFICIAL SCHOOL HOLIDAY	
WED	SEP 3	Early development in <i>C. elegans</i>	CH 8
FRI	SEP 5	<i>Drosophila</i> cleavage & gastrulation	CH 9
MON	SEP 8	<i>Drosophila</i> A-P polarity	CH 9
WED	SEP 10	<i>Drosophila</i> D-V polarity	CH 9
FRI	SEP 12	<i>Dictyostelium</i> , cAMP signaling	CH 2: 36-39 Nature Rev MCB 5:531-541
MON	SEP 15	<i>Dictyostelium</i> , cAMP signaling	CH 2: 36-39 Nature Rev MCB 5:531-541
WED	SEP 17	Amphibian cleavage & gastrulation	CH 2: 25-31, CH 10
FRI	SEP 19	EXAM 1	
MON	SEP 22	Axis formation in amphibians	CH 10
WED	SEP 24	Cleavage & gastrulation in the chick	CH 11
FRI	SEP 26	Mammalian cleavage & gastrulation	CH 11
MON	SEP 29	CNS & epidermal development	CH 12, CH 6: 139-158
WED	OCT 1	CNS & epidermal development	CH 12, CH 6: 139-158
FRI	OCT 3	Group Presentations	
MON	OCT 6	Neural crest	CH 13
WED	OCT 8	Myogenesis	CH 14
FRI	OCT 10	Osteogenesis & urogenesis	CH 14
MON	OCT 13	MID-TERM BREAK	
WED	OCT 15	EXAM 2	
FRI	OCT 17	Heart development	CH 15
MON	OCT 20	Heart development	CH 15
WED	OCT 22	Limb bud formation	CH 16, CH 6: 147-160
FRI	OCT 24	Limb development	CH 16, CH 6: 147-160
MON	OCT 27	Group Presentations	
WED	OCT 29	Limb development	CH 16, CH 6: 147-160
FRI	OCT 31	Sex determination	CH 17
MON	NOV 3	Sex determination	CH 17
WED	NOV 5	X chromosome silencing	CH 5

FRI	NOV 7	Metamorphosis	CH 18
MON	NOV 10	Group Presentations	
WED	NOV 12	Aging	CH 18
FRI	NOV 14	<i>Drosophila</i> oogenesis	CH 19
MON	NOV 17	Germ cell determination in <i>C. elegans</i>	CH 19
WED	NOV 19	Germ cell determination in <i>C. elegans</i>	CH 19
FRI	NOV 21	Group Presentations	
MON	NOV 24	Mammalian gametogenesis	CH 19
WED	NOV 26	EXAM 3	
FRI	NOV 28	OFFICIAL SCHOOL HOLIDAY	
MON	DEC 1	Teratogenesis	CH 21
WED	DEC 3	Teratogenesis	CH 21
FRI	DEC 5	Developmental Therapies	CH 21
WED	DEC 15	FINAL EXAM (2:50-5:40)	