



UNIVERSITY OF CALGARY
 FACULTY OF SCIENCE
 DEPARTMENT OF BIOLOGICAL SCIENCES
 COURSE OUTLINE

1. **Course: CMMB 505 – ADVANCED DEVELOPMENTAL BIOLOGY**

Seminar Section: L01 TR 11:00-12:15 SA 109 WINTER 2018

Course Coordinator: Dr. J. Cobb

Instructor: **Dr. J. COBB** **BI 286D** **220-3554** **jacobb@ucalgary.ca**

Desire 2 Learn (D2L) course name: CMMB 505 L01-(Winter 2018)-Advanced Developmental Biology
 Biological Sciences Department BI 186; (403) 220-3140; biosci@ucalgary.ca

2. **PREREQUISITE(S):** CMMB 403
 See section 3.5.C in the Faculty of Science section of the online Calendar
<http://www.ucalgary.ca/pubs/calendar/current/sc-3-5.html>

3. **Grading:** The University policy on grading and related matters is described sections [F.1](#) and [F.2](#) of the online University Calendar. In determining the overall grade in the course the following weights will be used:

2 paper reviews (take home, 14 day time allowance)	20 + 30% =	50%
Class participation		20%
Class presentation		10%
Take home exam (12 day time allowance)		20%

(There will not be a final examination scheduled by the Registrar.)

Participation in this course requires acceptance of this grading structure. Each piece of work (paper reviews, exams) submitted by the student will be assigned a percentage score. The student's average percentage score for the various components listed above will be combined with the indicated weights to produce an overall percentage for the course, which will be used to determine the course letter grade.

Letter Grade	A+	A	A-	B+	B	B-	C+	C	C-	D+	D
Min. Percent Required	93	83	80	77	73	70	67	63	60	57	50

Class Participation

Students are expected to perform all required readings prior to attending each class. Students are expected to participate in discussions, and if called upon, to be able to answer questions on either assigned readings or lecture content. As noted above 20% of the grade is based on class participation. Students that only attend but do not actively participate will therefore score very poorly (i.e, 0%) in this component.

4. **Missed Components of Term Work:** The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar in [Section 3.6](#). It is the student's responsibility to familiarize himself/herself with these regulations. See also [Section E.6](#) of the University Calendar

5. **Scheduled out-of-class activities:** N/A

6. **Course Materials:** Course Text: There is no course text book. All material will be from the scientific literature. PDFs of the assigned paper will be distributed via the D2L website for each class, or a link to the pdf will be provided. Scott Gilbert's "Developmental Biology" 10th Ed. is highly recommended as a reference.

A second text for cell biology/signal transduction is Alberts et al. Molecular Biology of the Cell (MBoC) <http://www.ncbi.nlm.nih.gov/80/books/>

7. **Examination Policy:** All exams and assignments are prepared outside of class. These must be performed independently by each student—no group work. The only exception is the student presentation, which is a group effort. Students should also read the Calendar, Section G, on Examinations.

8. **Writing across the curriculum statement:** In this course, the quality of the student's writing will be a factor in the evaluation of the student's performance.. See also [Section E.2](#) of the University Calendar.

9. **Human studies statement:** indicating whether students in the course may be expected to participate as subjects or researchers. See also [Section E.5](#) of the University Calendar.

ETHICS IN THE BIOLOGICAL SCIENCES

Studies in the Biological Sciences involve the use of living and dead organisms. Students taking laboratory- and field-based courses in these disciplines can expect involvement with and experimentation on such materials. Students perform dissections on dead or preserved organisms in some courses. In particular courses, students experiment on living organisms, their tissues, cells, or molecules. Sometimes field work requires students to collect a variety of living materials by many methods, including humane trapping.

All work on humans and other animals conforms to the Helsinki Declaration and to the regulations of the Canadian Council on Animal Care. The Department strives for the highest ethical standards consistent with stewardship of the environment for organisms whose use is not governed by statutory authority. Individuals contemplating taking courses or majoring in one of the fields of study offered by the Department of Biological Sciences should ensure that they have fully considered these issues before enrolling. Students are advised to discuss any concern they might have with the Undergraduate Program Director of the Department.

10. OTHER IMPORTANT INFORMATION FOR STUDENTS:

- (a) **Misconduct:** Academic misconduct (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under [Section K](#). Student Misconduct to inform yourself of definitions, processes and penalties.
- (b) **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on [assembly points](#).
- (c) **Student Accommodations:** Students needing an Accommodation because of a Disability or medical condition should contact Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities available at http://www.ucalgary.ca/policies/files/policies/procedure-for-accommodations-for-students-with-disabilities_0.pdf.
- Students needing an Accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, preferably in writing, to the Associate Head of Biological Sciences, Dr. H. Addy by email addy@ucalgary.ca or phone 403 220-3140.
- (d) **Safewalk:** Campus Security will escort individuals day or night (<http://www.ucalgary.ca/security/safewalk/>). Call 220-5333 for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.
- (e) **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPPA). As one consequence, students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information see also <http://www.ucalgary.ca/secretariat/privacy>.
- (f) **Student Union Information:** VP Academic Phone: 403 220-3911 Email: suvpaca@ucalgary.ca
SU Faculty Rep. Phone: 403 220-3913 Email: science1@su.ucalgary.ca, science2@su.ucalgary.ca and science3@su.ucalgary.ca;
Student Ombuds Office: 403 220-6420 Email: ombuds@ucalgary.ca; <http://ucalgary.ca/provost/students/ombuds>
- (f) **Internet and Electronic Device Information:** You can assume that in all classes that you attend, your cell phone should be turned off unless instructed otherwise. Also, communication with other individuals, via laptop computers, Blackberries or other devices connectable to the Internet is not allowed in class time unless specifically permitted by the instructor. If you violate this policy you may be asked to leave the classroom. Repeated abuse may result in a charge of misconduct.
- (g) **U.S.R.I.:** At the University of Calgary, feedback provided by students through the Universal Student Ratings of Instruction (USRI) survey provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses (www.ucalgary.ca/usri). Your responses make a difference - please participate in USRI Surveys.

Department Approval _____ ORIGINAL SIGNED _____ Date _____

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The Use of World Wide Web Material in Term Papers, Lab Reports and Assignments

As with other more traditional sources of material, information obtained from the Web must be fully and accurately cited. As with all other sources, students must take full responsibility for the quality, accuracy and verifiability of material that they cite. Because Web sites may be transient, the following must be done if Web sites are cited:

- *A full Website address must be provided, and the date on which it was accessed.*
- *A print-out of the home page of the Web site and the page on which the particular information begins must be included as appendix material for the term paper or assignment. See Academic Misconduct statement on previous page.*

LEARNING OUTCOMES

At the end of CMMB 505, students who give a diligent effort will be able to

- Explain the experiments that led to critical discoveries in our understanding of the development of animals.
- Describe the important molecular techniques used in developmental biology.
- Outline the discoveries that established that molecular homologies underlie the common developmental pathways in all animals.
- Critique and extract information from the primary, current literature of developmental biology at an advanced level.
- Interpret and critique experimental results from the primary developmental biology literature.
- Prepare and deliver oral presentations in which they describe and critique developmental biology studies from the primary literature.
- Formulate theoretical experimental approaches to address problems in developmental biology.
- Debate the pros and cons of recent controversial methods used in developmental biology and related areas of medicine.

2018 Course Schedule and Topics

Schedule	Lecturer	Preliminary Title
Jan 9	John Cobb	Orientation, observing embryos with worksheet
Jan 11	John Cobb	Lecture and discussion on techniques and historical background
Jan 16	John Cobb	Mouse techniques—CRISPR and other new techniques
Jan 18	John Cobb	Dissecting a paper Part 1, example using pathogenic disruptions of chromatin domains
Jan 23	John Cobb	Dissecting a paper Part 2, example using pathogenic disruptions of chromatin domains
Jan 25	John Cobb	Historical background 1-Discovery of the homeobox
Jan 30	John Cobb	Historical background 2-Discovery of <i>Hox</i> gene colinearity (First paper assigned)
Feb 1	John Cobb	Discovery of <i>Dmrt1</i>
Feb 6	John Cobb	Discovery of the Sonic hedgehog limb enhancer
Feb 8	John Cobb	Human specific enhancers
Feb 13	John Cobb	Sex maintenance: DMRT1 and female reprogramming
Feb 15	John Cobb	DMRT3 function in horses
Feb 20	John Cobb	READING WEEK NO CLASS
Feb 22	John Cobb	READING WEEK NO CLASS
Feb 27	John Cobb	Induced pluripotent stem cells 1 (First paper due)
Mar 1	John Cobb	Induced pluripotent stem cells 2
Mar 6	Jessica Rosin	Function of microglia in central nervous system development (2nd paper assigned)
Mar 8	Ramya Singh	<i>C. elegans</i> germline stem cells
Mar 13	Isabella Skuplik	Pigeon feet and butterfly wing spots
Mar 15	Student talks	9 groups of 3 students, 1 group per class
Mar 20	Student talks	" (2nd paper due)
Mar 22	Student talks	"
Mar 27	Student talks	"
Mar 29	Student talks	"
Apr 3	Student talks.	"
Apr 5	Student talks	"
Apr 10	Student talks	"
Apr 12	Student talks	Take home final given out
Apr 25		Take home final due