



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      EDC 280      WINTER 2019

Course Coordinator:      Dr. J. Cobb

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

Office Hours: Open door policy or by appointment

Desire 2 Learn (D2L) course name: CMMB 505 L01-(Winter 2018)-Advanced Developmental Biology

NOTE: Students must use their UofC account for all course correspondence.

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:

<b>2 paper reviews (take home, 16-day time allowance)</b>	<b>20 + 30% =</b>	<b>50%</b>
<b>Class participation</b>		<b>20%</b>
<b>Class presentation</b>		<b>10%</b>
<b>Take home exam (14-day time allowance)</b>		<b>20%</b>

**(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	94	85	82	79	75	72	69	65	62	59	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 in laboratory reports will be a factor in the evaluation of those reports. See also [Section E.2](#) of the University Calendar.

**9. Human & living organism studies statements:**

Students will not participate as subjects or researchers in human studies. See also Section E.5 of the University Calendar.

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. Reappraisal of grades:**

A student wishing a reappraisal, should first attempt to review the graded work with the Course coordinator/instructor or department offering the course. Students with sufficient academic grounds may request a reappraisal. Non-academic grounds are not relevant for grade reappraisals. Students should be aware that the grade being reappraised may be raised, lowered or remain the same. See Section I.3 of the University Calendar.

a. **Term Work:** The student should present their rationale as effectively and as fully as possible to the Course coordinator/instructor within **15 days** of either being notified about the mark, or of the item's return to the class. If the student is not satisfied with the outcome, the student shall immediately submit the Reappraisal of Graded Term work form to the department in which the course is offered. The department will arrange for a reassessment of the work if, and only if, the student has sufficient academic grounds. See sections I.1 and I.2 of the University Calendar

b. **Final Exam:** The student shall submit the request to Enrolment Services. See Section I.3 of the University Calendar.

**11. Other Important Information For Students:**

a. **Mental Health** The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the mental health resources available throughout the university community, such as counselling, self-help resources, peer support or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student Centre, Mental Health Services Website) and the Campus Mental Health Strategy website (Mental Health).

b. **SU Wellness Center:** The Students Union Wellness Centre provides health and wellness support for students including information and counselling on physical health, mental health and nutrition. For more information, see [www.ucalgary.ca/wellnesscentre](http://www.ucalgary.ca/wellnesscentre) or call 403-210-9355.

c. **Sexual Violence:** The University of Calgary is committed to fostering a safe, productive learning environment. The Sexual Violence Policy (<https://www.ucalgary.ca/policies/files/policies/sexual-violence-policy.pdf>) is a fundamental element in creating and sustaining a safer campus environment for all community members. We understand that sexual violence can undermine students' academic success and we encourage students who have experienced some form of sexual misconduct to talk to someone about their experience, so they can get the support they need. The Sexual Violence Support Advocate, Carla Bertsch, can provide confidential support and information regarding sexual violence to all members of the university community. Carla can be reached by email ([svsa@ucalgary.ca](mailto:svsa@ucalgary.ca)) or phone at 403-220-2208.

d. **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. Examples of academic misconduct may include: submitting or presenting work as if it were the student's own work when it is not; submitting or presenting work in one course which has also been submitted in another course without the instructor's permission; collaborating in whole or in part without prior agreement of the instructor; borrowing experimental values from others without the instructor's approval; falsification/fabrication of experimental values in a report. **These are only examples.**

e. **Assembly Points:** In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on assembly points.

f. **Academic Accommodation Policy:** 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 [procedure-for-accommodations-for-students-with-disabilities.pdf](#). Students needing an accommodation in relation to their coursework or to fulfill requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to the Associate Head, Undergraduate of the Department of Biological Sciences, Heather Addy by email [addy@ucalgary.ca](mailto:addy@ucalgary.ca) or phone 403 220-6979. Religious accommodation requests relating to class, test or exam scheduling or absences must be submitted no later than **14 days** prior to the date in question. See Section E.4 of the University Calendar.

g. **Safewalk:** Campus Security will escort individuals day or night (See the Campus Safewalk website). Call 403-220-5333 for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.

- h. **Freedom of Information and Privacy:** This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). 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 Legal Services website.
- i. **Student Union Information:** VP Academic, Phone: 403-220-3911 Email: suvpaca@ucalgary.ca. SU Faculty Rep., Phone: 403-220-3913 Email: sciencerep@su.ucalgary.ca. Student Ombudsman, Email: suvpaca@ucalgary.ca.
- j. **Internet and Electronic Device Information:** Unless instructed otherwise, cell phones should be turned off during class. All communication with other individuals via laptop, tablet, smart phone or other device is prohibited during class unless specifically permitted by the instructor. Students that violate this policy may be asked to leave the classroom. Repeated violations may result in a charge of misconduct.
- k. **Surveys:** At the University of Calgary, feedback through the Universal Student Ratings of Instruction (USRI) survey and the Faculty of Science Teaching Feedback form provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses. Your responses make a difference - please participate in these surveys.

Department Approval \_\_\_\_\_ ORIGINAL SIGNED \_\_\_\_\_ Date \_\_\_\_\_

Department Approval for  
NO Final Exam: \_\_\_\_\_ ORIGINAL SIGNED \_\_\_\_\_ Date \_\_\_\_\_  
M505 co W19; 1/3/2019 11:22 AM

## **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.

Academic dishonesty: No form of academic misconduct (cheating, plagiarism, or any other form) will be tolerated. All cases will be dealt with rigorously and may lead to disciplinary probation or suspension or expulsion. The Faculty of Science has a zero tolerance policy regarding dishonesty. For further information see the appropriate sections of the University calendar.

## **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.

## CMMB 505 2019 Tentative Course Schedule and Topics

<b>Date</b>	<b>Lecturer</b>	<b>Preliminary Title</b>
Jan 10	John Cobb	Observing embryos with worksheet
Jan 15	John Cobb	Intro to the course, techniques and background for first paper (Herberg et al.)
Jan 17	John Cobb	First paper! How to dissect a paper using Herberg et al., 2018 as an example.
Jan 22	John Cobb	Historical background #1: Discovery of the homeobox ( <b>Paper</b> )
Jan 24	John Cobb	Historical background #2: Discovery of <i>Dmrt1</i> ( <b>Paper</b> )
Jan 29	John Cobb	<i>Dmrt1</i> in Sex determination and sex maintenance ( <b>Paper</b> )
Jan 31	John Cobb	3D chromatin organization and the regulation of genes during development ( <b>Lecture</b> ) <b>(also First Assignment Posted)</b>
Feb 5	John Cobb	Pathogenic disruptions of chromatin domains ( <b>Paper</b> : Lupianez et al.)
Feb 7	John Cobb	Induced pluripotent stem cells 1 ( <b>Lecture</b> /background)
Feb 12	John Cobb	Induced pluripotent stem cells 2 ( <b>Paper</b> : Takahashi and Yamanaka)
Feb 14	John Cobb	Organoids (Lecture, begin <b>Paper</b> )
<b>Feb. 15 (Friday)</b>		<b>FIRST ASSIGNMENT DUE, 5 pm</b>
Feb 19		READING WEEK NO CLASS
Feb 21		READING WEEK NO CLASS
Feb 26	John Cobb	Organoids continued ( <b>Paper</b> )
Feb 28	John Cobb	Single-cell RNA-Seq in the study of Development ( <b>Paper</b> )
Mar 5	Student talks	<b>10 groups of 3 students, 1 group per class, papers are assigned</b> <b>(also 2<sup>nd</sup> paper assigned)</b>
Mar 7	Student talks	“
Mar 12	Student talks	“
Mar 14	Student talks	“
Mar 19	Student talks	“
Mar 21	Student talks	“
<b>March 22 (Friday)</b>		<b>2<sup>nd</sup> paper due, 5 pm</b>
Mar 26	Student talks	“
Mar 28	Student talks	“
Apr 2	Student talks.	“
Apr 4	Student talks	“
Apr 9	Student talks	“
Apr 11	Student talks	Take home final given out
Apr 25		Take home final due