

DEVELOPMENTAL BIOLOGY
BIOL 317, SPRING 2021

Instructor: Dr. Karin Bodensteiner
Office: Room 308 Chemistry Biology Building
Phone: (715) 346-3994
E-mail: kbodenst@uwsp.edu

Lecture: Synchronous online via Zoom; Monday, Wednesday, and Friday, 12:00-12:50 p.m.

URL: <https://uwsp.zoom.us/j/99353928472?pwd=M2JLRGs0L094aHB0MFBVdSs2b1J5QT09&from=addon>

Meeting ID: 993 5392 8472

Passcode: 312497

Laboratory: In-person cohorts, CBB 120, Wednesday 2:00 to 3:20 or 3:30 to 4:50 p.m.

Course Prerequisites: BIOL 210 or Instructor Consent

Textbook: Gilbert and Barresi (2016), *Developmental Biology*, 12th Edition. Sinauer Associates, Sunderland, MA. **Enhanced e-book:** ISBN 978-1-60-535823-9, (180-day access); **Loose Leaf:** ISBN 978-1-60-535824-6; or **Hardcover text:** ISBN 978-1-60-535822-2; **Student Resources:** https://learninglink.oup.com/access/barresi-12e-student-resources#tag_all-chapters. We will also be using Tyler and Kozlowski (2010) *Vade Mecum*³ for some of our laboratory exercises.

Virtual Office Hours: Tuesday and Thursday 12:00-1:30 p.m. via Zoom, or by appointment.

URL: <https://uwsp.zoom.us/j/93434963822?pwd=b0NsUGhRVWpidVlkTzE4N2xIZ0hFdz09&from=addon>

Meeting ID: 934 3496 3822

Passcode: 578333

Course Content and Additional Course Information: We will use Canvas for delivery of course material. Please visit the Canvas training site for help with using Canvas (<https://uwstp.instructure.com/enroll/36GKLY>). Material associated with each lecture and lab will be posted to Canvas as we go through the semester.

Zoom Support: <https://www.uwsp.edu/infotech/Pages/Tutorials/Zoom/Zoom.aspx>

System Requirements:

Because this is largely an on-line course, it is important that you have the appropriate tools to access course content. Your phone is not an adequate interface for some course components, so you will need a computer outfitted with Chrome (version 80 or higher) or Firefox. Other internet browsers can be extremely glitchy and do not work well with Canvas.

As some components of this course are synchronous (meetings on line that you attend at a specific time), you should have a stable internet connection that meets the following specifications:

- 800kbps/1.0Mbps (up/down) for high quality video
- For gallery view and/or 720p HD video: 1.5Mbps/1.5Mbps (up/down)
- Receiving 1080p HD video requires 2.5mbps (up/down)

If you are unsure of your internet specifications, please check with your internet provider.

If you need to access computers on campus, please consult this listing of availability:

<https://www.uwsp.edu/infotech/Pages/ComputerLabs/All-Labs.aspx>

Course Description:

Early developmental and physiological components of animal and plant species; gametogenesis, cell-cell interactions, induction effects, cell migration and organogenesis; how these processes influence developmental patterns. Common model systems (e.g. sea urchins, chick, planaria) will be used in the laboratory to gain a basic understanding of key developmental processes. This course will include lecture, laboratory, and student presentations. Regular student participation and open discussion are encouraged.

Student Learning Outcomes: (with diligent effort on their part, upon completing this course, students should be able to...)

1. Describe key developmental processes from gametogenesis through senescence and aging.
2. Compare and contrast patterns of development in a variety of model organisms.
3. Apply the scientific method and basic laboratory skills to the study of developmental processes.
4. Discuss environmental, social, and legal issues pertaining to developmental biology and explain the nature of beliefs surrounding these issues.

Lecture:

Our class will be held synchronously at the scheduled lecture time (M/W/F from 12:00 to 12:50 p.m.) in a regularly scheduled Zoom meeting. I am hopeful that these meetings will be similar to an in-person class, where you are free to ask questions, discuss material, and engage with your classmates, instructor, and course material. Although I will be posting recordings of these lectures on Canvas once they are completed, attendance is expected and will factor in to your professionalism grade at the end of the semester.

Laboratory:

There will be two cohorts of 8 students each for lab. Cohorts will be assigned one of two times and you are expected to attend in person at your assigned time every week. Developmental biology lab is not easily taught in an online/virtual format, and due to camera incompatibility, laboratory sessions will not be broadcast or provided via Zoom. Since there may not be online options for completion of laboratory exercises, if you cannot attend our lab meetings in-person, you must let me know in advance so we can discuss options. Please see the lab schedule at the end of this document for additional details.

Point Breakdown:

Lecture Exams	3 @ 100 pts
Laboratory Exercises (various)	125 pts
Outline and Bibliography	20 pts
Student Presentation	80 pts
<u>Professionalism</u>	<u>50 pts</u>
Total	575 pts

Grade Scale (out of 100% of Total):

A ≥ 93-100	C = 73-76
A- = 90-92	C- = 70-72
B+ = 87-89	D+ = 67-69
B = 83-86	D = 60-66
B- = 80-82	F < 60.0
C+ = 77-79	

Exams and Assignments:

There will be three exams: two during the course of the semester and one during finals week. Each lecture exam is worth 100 points. Exams will consist of multiple choice, problem sets, definitions, fill-ins, and short answer questions. In addition, application of information provided in lecture to an unknown problem may be required. Course material will build over the semester and it will be important for you to remember and apply basic information learned early on to material covered later in the course. Points will also be awarded in the laboratory. These points will come from lab-based worksheets, exercises, and assignments throughout the semester. You should expect some form of assignment almost every week in lab. All exams and assignments will count towards the final grade (i.e. no grades will be dropped).

Professionalism:

Attendance: You are expected to attend and/or complete (either virtually or in person) all lectures and labs. If you will miss a class due to a college-sanctioned event, you must notify your instructor in advance and complete any coursework before the next scheduled lab or class period. Exams must be taken at the assigned time and alterations to this schedule will only be made for emergencies. In such cases, evidence of some kind must be provided and you are expected to make arrangements within 48 hours of the exam to schedule a make-up. It is your responsibility to communicate concerns and get notes for any missed classes. As part of your professionalism grade, you will also be evaluated on course participation, including participation in virtual classes and on line discussions.

Behavior: Complete mutual respect and courtesy is expected and all students should come to class ready to be engaged and actively participate in the learning experience. Open, honest discussion is encouraged and will factor in to your professionalism grade.

Lecture materials and recordings for this course are protected intellectual property. Students in the course may use course materials and recordings for their personal use as related to participation in this class. Students may also take notes on course material. Students may not copy or share lecture materials outside of class, including posting on internet sites or selling to commercial entities. Students are also prohibited from selling their personal notes or being paid for taking notes without the instructor's express written permission. Unauthorized use of copyrighted materials (lecture notes, slides, and recordings) constitutes copyright infringement under university policy, and University of Wisconsin System Chapters 14 and 17, governing student academic and non-academic misconduct.

Honor Lock:

We will be using Honorlock to proctor your exams this semester. Honorlock is an online proctoring service that allows you to take your exam remotely. You DO NOT need to create an account, download software or schedule an appointment in advance. You will need a computer, a working webcam, a functional microphone, a stable Internet connection, and the Chrome browser. Before you get started, please review the Honorlock Student module in Canvas to familiarize yourself with Honorlock.

Face Coverings:

At all UW-Stevens Point campus locations, the wearing of face coverings is mandatory in all buildings, including classrooms, laboratories, studios, and other instructional spaces. Any student with a condition that impacts their use of a face covering should contact the [Disability and Assistive Technology Center](#) to discuss accommodations in classes. Please note that unless everyone is wearing a face covering, in-person classes cannot take place. This is university policy and not up to the discretion of individual instructors. Failure to adhere to this requirement could result in formal withdrawal from the course.

Other Guidance:

- Please monitor your own health each day using [this screening tool](#). If you are not feeling well or believe you have been exposed to COVID-19, do not come to class; email your instructor and contact Student Health Service (715-346-4646). As with any type of absence, students are expected to communicate their need to be absent and complete the course requirements as outlined in the syllabus.
- Maintain a minimum of 6 feet of physical distance from others whenever possible.
- Do not congregate in groups before or after class; stagger your arrival and departure from the classroom, lab, or meeting room.
- Wash your hands or use appropriate hand sanitizer regularly and avoid touching your face.
- Please maintain these same healthy practices outside the classroom.

Grade Discrepancies:

Grades will be posted on Canvas throughout the semester. If there are discrepancies on any assignments, quizzes, or exams, they can be addressed with the instructor, in person, up to one week after the grade is posted. After this time, the grade will stand with whatever was originally granted.

Academic Policies:

Academic misconduct (as outlined and defined by Chapter 14 in the Academic Handbook: <https://www.uwsp.edu/acadaff/Pages/handbook.aspx>) will not be tolerated. Cheating or plagiarism will result in a score of zero for a give assessment and/or additional disciplinary action.

Disability Services:

Any student who feels that they may need an accommodation based on the impact of a disability should contact the Disability and Assistive Technology Center (room 609 Albertson Hall, datctr@uwsp.edu). If you have already registered with this office and would like to discuss your class accommodations for the semester, please meet with me.

Emergency Response Guidance:

- In the event of a medical emergency call 9-1-1 and guide emergency responders to victim.
- In the event of a tornado warning, proceed to lowest level interior room without windows.
- In the event of a fire alarm, evacuate building in a calm manner, meet on sidewalk to east of building, near UWSP sign. Notify instructor or emergency command personnel of any missing individuals.
- Active Shooter/Code React – Run/Escapes, Hide, Fight. If trapped hide, lock doors, turn off lights, spread out and remain quiet. Call 9-1-1 when it is safe to do so. Follow instructions of emergency responders.
- See UW-Stevens Point Emergency Procedures at www.uwsp.edu/rmgt/Pages/em/procedures for details on all emergency response protocols at UW-Stevens Point.

General Course Outline*:

Relevant Chapter(s)

Unit 1: The Beginning

Introduction/Overview	1
Cellular Specification	2
Differential Gene Expression	3
Cell-cell communication	4
Sex Determination and Gametogenesis	6
Fertilization	7

Unit 2: Early Development of Animals

Invertebrate Developmental Patterns	8-10
Amphibians and Fish	11
Birds and Mammals	12
Neurogenesis	13 & 14
The Neural Crest	15
The Epidermis	16

Unit 3: Later Developmental Processes and Their Implications

Major Organogenesis	17-20
Metamorphosis	21
Regeneration	22
Aging and Senescence	23
Development in Health and Disease	24
Environmental Regulation of Development	25

*Please note: Course schedule and topics covered are subject to change.

Course Schedule:

Jan. 25	First Day of Classes
Jan. 27	Lab Introduction and Scientific Method Experiment
Feb. 3	Microscopy
Feb. 10	Gametogenesis
Feb. 17	Research Day; Presentation Topic and Annotated Bibliography Due
Feb. 24	Sea Urchin Development
Feb. 26	EXAM 1, 12:00 to 12:50 p.m. on Canvas
Mar. 3	Sea Urchin Experimental Design and Critique
Mar. 10	Sea Urchin Write-Up Due
Mar. 17	Early Chick Development
Mar. 19	Final Outline and Bibliography Due
Mar. 22-26	Spring Break
Mar. 31	Origami Embryos
Apr. 7	Later Chick Development
Apr. 9	EXAM 2, 12:00 to 12:50 p.m. on Canvas
Apr. 14	Planaria Regeneration Experimental Design and Critique
Apr. 21	Planaria Regeneration Experiment Implementation
Apr. 28	Student Presentations
May 5	Student Presentations
May 12	Laboratory Check Out and Planarian Write-Up Due
May 14	Last Day of Classes
May 20	EXAM 3, 8:00-10:00 a.m. on Canvas