

BIOLOGY 342-001: DEVELOPMENTAL BIOLOGY

INSTRUCTOR: Dr. Daphne Soares

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OFFICE HOURS: Mon. after class or By Appointment

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COURSE SCHEDULE: M, W: 10:00 – 11:20AM in CKB 106

COURSE WEBSITE: <https://canvas.njit.edu/>

COURSE SUMMARY: Descriptive and experimental approaches to molecular, cellular and organismal changes during embryonic development; mechanisms of cell differentiation, organogenesis, morphogenesis, and pattern formation.

RECOMMENDED TEXT: Developmental Biology 12th edition Michael J.F. Barresi, Scott F. Gilbert eISBN-13: 9781605358239. Be sure to have access to Canvas (<https://canvas.njit.edu/>, login with your NJIT UCID; and use NJIT email).

LEARNING GOALS: At the end of the course Students will be able...

- 1) Name, describe and order the main stages of development common to most multicellular organisms.
- 2) • Describe the main anatomical changes that occur during development.
- 3) • Identify the cellular behaviors that lead to morphological change during development.
- 4) • Describe the hierarchy of gene activation that occurs in early Drosophila development.
- 5) • Understand how gene activation plays a role in differentiation and development.
- 6) • Describe the unique characteristics of the Hox genes and explain how they act as master regulators of development in multicellular organisms.
- 7) • Describe the main signaling pathways that play important roles in development.
- 8) • Explain how embryonic stem cells and their alternatives can be used in medical treatments.

GRADING POLICY & SCALE: THERE IS NO EXTRA CREDIT

Assignment	Points
Exams (3) 10 points each	30
Final	20
TOTAL	50

Grading Scale	
A	90 - 100
B+	85 - 89
B	80 - 84
C+	75 - 79
C	70 - 74
D	60 - 69
F	0 - 59

IMPORTANT RULES AND POLICIES:

- [Academic Integrity Code](#) is strictly enforced. Please review & be prepared to sign a statement before each exam.
- There will be three exams during the semester and each will consist of multiple-choice questions along with some short-answer questions. The exams will cover mainly new material (since the last exam), although some concepts from earlier in the course will be revisited on the later exams. Exam questions will be based on the lecture material.
- The final exam will be comprehensive and will consist of multiple-choice and short answer questions. Approximately half of the final exam will count for the last section of the course with the remaining half devoted to the first three sections.
- If you miss an exam due to a valid medical excuse, you need to provide a doctor's note or other valid & verifiable documentation. The grade of exams missed for a valid reason will be determined on a case-by-case basis.
- Final exam conflict resolution rules: <http://www.njit.edu/registrar/exams/conflict.php>

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Course Repetition Policy: An NJIT student may take a single course no more than four times (counting NJIT and another institutions), including withdrawals. If an undergraduate course is repeated at NJIT or the course is transferred from another institution, only then the lowest of the grades is excluded in computation of the cumulative GPA. All grades are shown on the student's transcript.

SCHEDULE AND COURSE OUTLINE: Dates listed by week; class will meet twice every week, unless otherwise noted.

WEEK / DATES	Topic	BOOK CHAP
Week 1	9/2 , 9/4 <i>No Class – Labor Day</i> • Introduction	Chap 1
Week 2	9/9, 11 Specifying Identity • Differential Gene Expression <i>[Sept 13: Last day to Add/Drop a class]</i>	Chap 2, 3
Week 3	9/16, 18 Cell to cell communication • Stem Cells	Chap 4, 5
Week 4	9/23, 25 Gametogenesis and fertilization	Chap 6, 7
Week 5	9/30, 10/2 EXAM 1 (Sept 30) – Covers Lectures 1-7 • Early development in snails flowers and nematodes.	Chap 8
Week 6	10/7, 9 Sea urchins and tunicates • Amphibians and Fish	Chap 10, 11
Week 7	10/14, 16 Birds and mammals • Neural tube	Chap 12, 13
Week 8	10/21, 23 Brain development • EXAM 2 (Oct 23) – Covers Lecturs 8-13	Chap 14
Week 9	10/28, 30 Neural crest • Ectoderm	Chap 15, 16
Week 10	11/4, 6 Mesoderm • Mesoderm II	Chap 17,18 & 19
Week 11	11/11, 13 Endoderm • Metamorphosis	Chap 20, 21
Week 12	11/18, 20 Regeneration • EXAM 3 (Nov 20) – Covers Lectures 14-19	Chap 22
Week 13	11/25, 27 Health and disease • <i>Wednesday 11/27 is a Friday: NO CLASS!</i>	Chap 23
Week 14	12/2, 4 Symbiosis and development • Evodevo	Chap 24, 25
Week 15	12/9, 11 Evodevo II • Review	Chap 25
FINAL EXAM WEEK: DECEMBER 14-20. FINAL EXAM DATE: TBD		

If you can't access Canvas, you need to activate your NJIT UCID. Visit: <https://newacct.njit.edu/~accts/cgi-bin/new>