

# FLORIDA ATLANTIC UNIVERSITY™

UGPC	APPROVAL
UFS	APPROVAL
SCNS	SUBMITTAL
CONFIRMED _____	
BANNER _____	POSTED
CATALOG _____	

## Graduate Programs—NEW COURSE PROPOSAL <sup>1</sup>

DEPARTMENT: BIOLOGICAL SCIENCES

COLLEGE: CHARLES E. SCHMIDT COLLEGE OF SCIENCE

**RECOMMENDED COURSE IDENTIFICATION:**

PREFIX   BSC   COURSE NUMBER   6079   LAB CODE (L or C)       

(TO OBTAIN A COURSE NUMBER, CONTACT [MJENNING@FAU.EDU](mailto:MJENNING@FAU.EDU))

COMPLETE COURSE TITLE: GENES AND DEVELOPMENT

**EFFECTIVE DATE**

(first term course will be offered)

SPRING 2017

CREDITS <sup>2</sup>: 3

TEXTBOOK INFORMATION: ESSENTIAL DEVELOPMENTAL BIOLOGY – JONATHAN SLACK (3<sup>RD</sup> EDITION)

GRADING (SELECT ONLY ONE GRADING OPTION): REGULAR   R   SATISFACTORY/UNSATISFACTORY       

**COURSE DESCRIPTION, NO MORE THAN THREE LINES:**

Students will become familiarized with the cellular and molecular mechanisms that underlie organismal development, including differential gene regulation, intercellular communication, fertilization, pattern formation, organogenesis, animal stem cells and cloning, evolution and development, sex determination, and developmental disorders.

**PREREQUISITES\*:**

GRADUATE LEVEL OR PERMISSION OF INSTRUCTOR

**COREQUISITES\*:**

**REGISTRATION CONTROLS (MAJOR, COLLEGE, LEVEL)\*:**

GRADUATE LEVEL OR PERMISSION OF INSTRUCTOR

\* PREREQUISITES, COREQUISITES AND REGISTRATION CONTROLS WILL BE ENFORCED FOR ALL COURSE SECTIONS.

**MINIMUM QUALIFICATIONS NEEDED TO TEACH THIS COURSE: PH.D. DEGREE OR GRADUATE-LEVEL DEGREE IN A RELATED FIELD, WITH SPECIALIZATION IN PERTINENT FIELDS, CONTINGENT UPON DEPARTMENT APPROVAL.**

Faculty contact, email and complete phone number:

Catherine F. Trivigno  
[trivigno@fau.edu](mailto:trivigno@fau.edu)  
561-799-8514

Please consult and list departments that might be affected by the new course and attach

comments. <sup>3</sup>  
College of Medicine: Please see attached

**Approved by:**

Department Chair: 

College Curriculum Chair: 

College Dean: 

UGPC Chair: \_\_\_\_\_

Graduate College Dean: \_\_\_\_\_

UFS President: \_\_\_\_\_

Provost: \_\_\_\_\_

**Date:**

02.09.16

2-19-16

2-19-16

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1. Syllabus must be attached; see guidelines for requirements: [www.fau.edu/provost/files/course\\_syllabus.2011.pdf](http://www.fau.edu/provost/files/course_syllabus.2011.pdf)

2. Review Provost Memorandum: Definition of a Credit Hour [www.fau.edu/provost/files/Definition\\_Credit\\_Hour\\_Memo\\_2012.pdf](http://www.fau.edu/provost/files/Definition_Credit_Hour_Memo_2012.pdf)

3. Consent from affected departments (attach if necessary)



Charles E. Schmidt College of Science  
Department of Biological Sciences  
777 Glades Road  
Boca Raton, FL 33431  
tel: 561.297-3320  
fax: 561.297-2749

**TO:** University Graduate Programs Committee (UGPC)  
**FROM:** Rodney Murphey, Ph.D.   
Professor and Chair  
Department of Biological Sciences  
**DATE:** February 8th, 2016  
**RE:** New Course Proposal Consent

To Whom It May Concern:

This note constitutes acknowledgement and consent of the Department of Biological Sciences for the creation of a new course within the department: **BSC 6079:Genes and Development**

Best Regards,

Rodney Murphey, Ph.D.  
Chairman, Department of Biological Sciences  
Director, Life Science Initiative on the MacArthur Campus

Email this form and syllabus to [UGPC@fau.edu](mailto:UGPC@fau.edu) **one week before** the University Graduate Programs Committee meeting so that materials may be viewed on the UGPC website prior to the meeting.



Charles E. Schmidt College of Medicine  
777 Glades Road  
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(561) 297-0706  
Fax: (561) 297-2519

Thursday, October 30th, 2014

To: Charles E. Schmidt College of Science  
Biology Department

The Biomedical Science Department in the Charles E. Schmidt College of Medicine has reviewed the new Biology course proposals for **BSC 4029- Genes and Development (undergraduate course)** and **BSC 6079- Genes and Development (graduate course)**, and does not have any objections. The courses do not contain any material that could constitute a conflict with our Biomedical Science Graduate program curriculum.

Sincerely,

A handwritten signature in black ink that reads 'Marc Kantorow'.

Marc Kantorow, Ph.D.  
Professor and Director of Graduate Programs  
Charles E. Schmidt College of Medicine  
Florida Atlantic University  
777 Glades Rd.  
Boca Raton, FL 33431  
561-297-2910  
[mkantoro@fau.edu](mailto:mkantoro@fau.edu)

Genes and Development  
Spring Semester 2017  
Course Syllabus



<http://www.pdn.cam.ac.uk/staff/lewis>

[http://www.hawaii.edu/malamalama/2009\\_02/development-returns-to-evolution-theory/](http://www.hawaii.edu/malamalama/2009_02/development-returns-to-evolution-theory/)

### Course Information

Course Title: *Genes and Development* (3 credits)

Course Number: BSC 6079

Course Dates/Time: January 13–May 6, 9:30 – 10:50 AM Wednesdays and Fridays

Course Location: Boca Raton Campus, TBA

Instructor: Dr. Catherine Trivigno  
Sanson Science Building Main Office (room 136)  
Email: [trivigno@fau.edu](mailto:trivigno@fau.edu)  
Phone: (561) 799-8514  
Office hours: Wednesdays 8:20-9:20 AM and Fridays 11:00 AM- 12:00 or by appointment

Course Description: This lecture course is open to advanced undergraduates and graduate students. In this course students will become familiarized with the cellular and molecular mechanisms that underlie organismal development. This will include discussion of specific developmental pathways and topics including differential gene

regulation, intercellular communication, fertilization, pattern formation, organogenesis, animal stem cells and cloning, evo/devo (evolution and development), sex determination, and developmental disorders. A variety of invertebrate and vertebrate experimental model systems will be discussed, including *C. elegans*, *Drosophila*, *Xenopus*, zebrafish, chick and mice. We will discuss both conceptual and experimental advances in developmental biology and the different methodologies that are currently available to developmental biologists.

Course objectives/student learning outcomes: Students will gain facility with the issues, concepts, and experimental approaches of historical and modern developmental biology. They will be able to integrate this knowledge into a wider framework of understanding the diversity and complexity of living organisms.

Course prerequisites: Students must be a graduate student or have permission of instructor. It is helpful to have completed undergraduate courses in Genetics, Biochemistry, and/or Molecular and Cell Biology.

Course evaluation methods: There will be a quiz or exam each week in this course (except for week 1). Please see the section on attendance below. More than one unexcused absence will result in an "F". Students may not make up any quiz or exam missed due to an unexcused absence or to arriving late for class.

*Students taking the course for graduate credit must perform additional work in the form of a presentation to the class. They will be graded on their performance in the following areas.*

4 quizzes (out of 5, lowest quiz grade dropped) – 40% total

2 exams – 50% total

One oral presentation to the class (TBA) – 10% total

**Required Textbook:**

Essential Developmental Biology, Jonathan Slack

3rd edition 2012 Wiley-Blackwell Press

ISBN#: 978-1-1180-2286-3

**Tentative List of Topics (topics, timing, and order subject to change):**

- Week 1** Course Overview and Introduction -overview of developmental biology  
**Assignment-** Read Ch. 1-2, study Powerpoint slides on Blackboard
- Week2** Concepts in regulation of gene expression –transcription and translation, regulatory sequences, transcription factors, epigenetics  
**Assignment –** Read Ch. 3, study Powerpoint slides on Blackboard
- Week3** Developmental biology methodologies – microscopy, genetics, genomics/bioinformatics, comparative approaches  
**Assignment-**Read Ch. 4, study Powerpoint slides on Blackboard
- Week4** Classical and Experimental Embryology – worms vs. flies vs. frogs vs. chicks vs. mice  
**Assignment –** Read Ch. 5 & 6, study Powerpoint slides on Blackboard
- Week5** Transcription Regulation – The discovery of Hox genes  
**Assignment –** Read Ch. 7 & 8, study Powerpoint slides on Blackboard
- Week6** Signaling pathways–Notch, lateral inhibition, TGF-beta, etc  
**Assignment-**Read Appendix 1, study Powerpoint slides on Blackboard
- Week 7** Fertilization-gametogenesis and activation of the egg  
**Assignment –** Read Ch. 19, study Powerpoint slides on Blackboard  
  
Exam 1
- WeekS** Pattern Formation –segmentation in Drosophila; Dorsal/Ventral patterning of fly embryo; neural tube patterning  
**Assignment-**Read Ch. 11 & 13, study Powerpoint slides on Blackboard

**Week9** Nervous System Development-neural induction; neural stem cell formation; ASC genes, Notch pathway; neurons versus glia; axonogenesis; synaptogenesis

**Assignment** – Read Ch. 14, find and start reading a research article for your presentation, study Powerpoint slides on Blackboard

**Week 10** Muscle Development-mesoderm specification; myogenesis; muscle fiber formation and differentiation

**Assignment** – Read Ch. 15, work on research article, study Powerpoint slides on Blackboard

**Week 11** Evolution and Development – the making of the fittest; Sex determination – comparison of methods in various organisms

**Assignment** – Read Ch. 22, work on presentation, study Powerpoint slides on Blackboard

**Week 12** Stem Cells – embryonic, adult, induced

**Assignment** – Read Ch. 21, work on presentation, study Powerpoint slides on Blackboard

**Week 13** Regeneration/Aging/Cloning – developmental plasticity

**Assignment** – Read Ch. 20, study Powerpoint slides on Blackboard

**Week 14** Development and Medicine – genetic disorders of development; diagnoses and therapies

**Assignment** – Turn in evaluations of student talks, review for exam, study Powerpoint slides on Blackboard

Exam2



## Policy on absences, religious accommodations, makeup tests, and incompletes

Students may not make up any quiz or exam missed due to an unexcused absence or to arriving late for class. Absences for which a medical or court excuse is provided within 48 hours of the absence (professional letterhead required) will be considered excused absences, and the student will be allowed to take a make-up exam or quiz if appropriate. Taking a vacation is not considered an excused absence – it is not acceptable for students to plan vacations that interfere with a six-week course such as this one. Reasonable accommodation will also be made for students participating in a religious observance. Students will be given the opportunity to make up work missed only during excused Absences. An Incomplete (I) may be given to students who, at the end of the course, have not completed all of the required course work due to exceptional circumstances, but otherwise have passing grades.

## Students with Disabilities

*In compliance with the Americans with Disabilities Act (ADA), students who require reasonable accommodations due to a disability to properly execute coursework must register with the Office of Student Accessibility Services (SAS) and follow all SAS procedures. SAS has offices across three of FAU's campuses- Boca Raton, Davie, and Jupiter, however, disability services are available for students on all campuses.*

## Code of Academic Integrity policy

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see University Regulation 4.001. [http://www.fau.edu/ctl/4.001 Code of Academic Integrity.pdf](http://www.fau.edu/ctl/4.001%20Code%20of%20Academic%20Integrity.pdf)