# FLORIDA &TLANTIC UNIVERSITY

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CATALOG	

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Graduate Programs—N	EW COURSE PRO	POSAL <sup>1</sup>	BANNER POSTED CATALOG	
DEPARTMENT: BIOLOGICAL SCIENCES COLLEGE: CHARLES E. SCHMIDT COLLEGE OF SCIENCE				
RECOMMENDED COURSE IDENTIFICATION			EFFECTIVE DATE	
PREFIXBSC COURSE NUMBER6079 LAB CODE (L or C)		(first term course will be offered)		
(TO OBTAIN A COURSE NUMBER, CONTACT <u>MJENNING@FAU.EDU</u> )		SPRING 2017		
COMPLETE COURSE TITLE: GENES AND DEVELOPMENT				
CREDITS <sup>2</sup> : 3 TEXTBOOK INFORM	MATION: ESSENTIAL DEVELOPMEN	NTAL BIOLOGY – JONATHA	IN SLACK (3 <sup>RD</sup> EDITION)	
GRADING (SELECT ONLY ONE GRADING OPTI	ON): REGULARR SAT	isfactory/Unsatisfact	ORY	
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*:	COREQUISITES*: REGISTRATION CONTROLS (MAJOR, COLLEGE, LEVEL)*:			
GRADUATE LEVEL OR PERMISSION OF		GRADUATE LEVEL	GRADUATE LEVEL OR PERMISSION OF INSTRUCTOR	
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  561-799-8514  Please consult and list departments that might be affected by the new course and attach  comments,  College of Medicine: Please see attached				
Approved by:		Date:	. Syllabus must be attached; see	
Department Chair:	Durius 1	02.09.16	guidelines for requirements:	
College Curriculum Chair:		<u> </u>	www.fau.edu/provost/files/course syllabus.2011.pdf	
College Dean:			3. Review Provost Memorandum:	
UGPC Chair:			Definition of a Credit Hour www.fau.edu/provost/files/Definition	
Graduate College Dean:			Credit Hour Memo 2012.pdf	
UFS President:			3. Consent from affected departments	
Provost:			(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 <u>UGPC@fau.edu</u> 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 Boca Raton, FL 33431 (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,

Marc Kantorow, Ph.D.

Professor and Director of Graduate Programs Charles E. Schmidt College of Medicine

Florida Atlantic University

Mare Huntrow

777 Glades Rd. Boca Raton, FL 33431

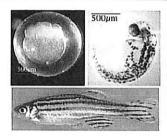
561-297-2910

mkantoro@fau.edu

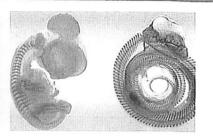
## Genes and Development

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/

#### **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 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 3<sup>rd</sup> 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

Week 2 Concepts in regulation of gene expression – transcription and translation, regulatory sequences, transcription factors, epigenetics

Assignment – Read Ch. 3, study Powerpoint slides on Blackboard

Week 3 Developmental biology methodologies – microscopy, genetics, genomics/bioinformatics, comparative approaches

Assignment - Read Ch. 4, study Powerpoint slides on Blackboard

Week 4 Classical and Experimental Embryology – worms vs. flies vs. frogs vs. chicks vs. mice

Assignment – Read Ch. 5 & 6, study Powerpoint slides on Blackboard

Week 5 Transcription Regulation – The discovery of Hox genes

Assignment – Read Ch. 7 & 8, study Powerpoint slides on Blackboard

Week 6 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

Week 8 Pattern Formation – segmentation in Drosophila; Dorsal/Ventral patterning of fly embryo; neural tube patterning

Assignment – Read Ch. 11 & 13, study Powerpoint slides on Blackboard

Week 9 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 differentitation

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

Exam 2

#### 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 with a disability who require reasonable accommodations to properly execute coursework must register with the Office for Students with Disabilities (OSD) - in Boca Raton SU 133 (561-297-3880); in Davie, LA 240 (954-236-1222); in Jupiter, SR 110 (561-799-8010) - and follow all OSD procedures.

#### **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. <a href="http://www.fau.edu/ctl/4.001">http://www.fau.edu/ctl/4.001</a> Code of Academic Integrity.pdf