

FLORIDA ATLANTIC UNIVERSITY™

Graduate Programs—NEW COURSE PROPOSAL¹

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

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:mjennin@fau.edu))

COMPLETE COURSE TITLE: GENES AND DEVELOPMENT

EFFECTIVE DATE

(first term course will be offered)

SPRING 2017

CREDITS²: 3

TEXTBOOK INFORMATION: ESSENTIAL DEVELOPMENTAL BIOLOGY—JONATHAN SLACK (3RD 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
561-799-8514

Please consult and list departments that might be affected by the new course and attach comments,³
College of Medicine: Please see attached

Approved by:

Department Chair: *Catherine F. Trivigno*

College Curriculum Chair: _____

College Dean: _____

UGPC Chair: _____

Graduate College Dean: _____

UFS President: _____

Provost: _____

Date:

02.09.16

1. Syllabus must be attached; see guidelines for requirements:
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

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 one week before the University Graduate Programs Committee meeting so that materials may be viewed on the UGPC website prior to the meeting.



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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

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
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
- 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 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

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. <http://www.fau.edu/ctl/4.001> Code of Academic Integrity.pdf