

FLORIDA ATLANTIC UNIVERSITY™

Graduate Programs—NEW COURSE PROPOSAL¹

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

DEPARTMENT: DEPT. OF BIOLOGICAL SCIENCES

COLLEGE: CHARLES E. SCHMIDT COLLEGE OF SCIENCE

RECOMMENDED COURSE IDENTIFICATION:

PREFIX BSC COURSE NUMBER 5029 LAB CODE (L or C)

(TO OBTAIN A COURSE NUMBER, CONTACT MJENNING@FAU.EDU)

COMPLETE COURSE TITLE: **ADVANCED MOLECULAR GENETICS OF AGING**

EFFECTIVE DATE

(first term course will be offered)

 SUMMER 2015

CREDITS²: 3

TEXTBOOK INFORMATION:

RESEARCH PAPERS AND REVIEW ARTICLES, AVAILABLE IN THE CONTENT FOLDER ON BLACKBOARD

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

COURSE DESCRIPTION, NO MORE THAN THREE LINES:

AN IN-DEPTH EXAMINATION OF CURRENT THEORIES OF AGING, MOLECULAR PATHWAYS MODULATING AGING, AND MAJOR DISCOVERIES ABOUT AGING IN MAMMALS AND IN DIFFERENT MODEL ORGANISMS, INCLUDING YEAST, C. ELEGANS, DROSOPHILA AND MOUSE.

PREREQUISITES *PCB 4023 OR EQUIVALENT

COREQUISITES*:

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

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

MINIMUM QUALIFICATIONS NEEDED TO TEACH THIS COURSE: MEMBER OF THE GRADUATE FACULTY OF FAU AND HAS A TERMINAL DEGREE IN THE SUBJECT AREA (OR A CLOSELY RELATED FIELD).

Faculty contact, email and complete phone number:
Dr. Kailiang Jia; kjia@fau.edu; 561-799-8054

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: [Signature]
 College Curriculum Chair: [Signature]
 College Dean: [Signature]
 UGPC Chair: [Signature]
 Graduate College Dean: [Signature]
 UFS President: _____
 Provost: _____

Date:

10/30/14
10/30/14
10/30/14
11/5/14 11/12/14
11/15/14

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)

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.

Advanced Molecular Genetics of Aging

Summer 2 Semester, 2015

Course information

Course Title: Advanced Molecular Genetics of Aging
Course Number: BSC5029 (3 credits)
Course Date: May 11, 2015 – June 22, 2015, Mon., Wed. and Fri., 1:00pm – 3:10pm
Course Location: Boca Campus, Sanson Life Science Building, Rm. 119
Instructor: Kailiang Jia, M.D., Ph.D.
Assistant Professor
Department of Biological Sciences
Sanson Life Science Building, Rm. 261
Email: kjia@fau.edu, Phone: (561) 799 - 8054
Office hours: Friday, 3:30pm – 5:30pm or by appointment

Course description

This course is open to graduate and upper level undergraduate students. In this course students will learn current theories of aging, molecular pathways modulating aging, major discoveries of aging in different model organisms including yeast, *C. elegans*, *Drosophila* and mouse, and in mammalian system. Additionally, students will learn how to read and criticize research articles.

Pre-requisite

Background knowledge in molecular biology and genetics

Course objectives/student learning outcomes

Students are expected to: gain current knowledge and research methods of aging and learn how to design experiments to address aging-related scientific questions.

Instructional methods

Lectures, paper discussions and student presentations

Required texts/reading

Research papers and review articles, available in the Content folder on Blackboard.

Supplementary/recommended reading

1. Molecular Biology of Aging (2008). Edited by Leonard P. Guarente, Linda Partridge and Douglas C. Wallace. Cold Spring Harbor Laboratory Press. Cold Spring Harbor, New York
2. Online materials
<http://www.nia.nih.gov/health/featured/healthy-aging-longevity>
[http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1474-9726](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1474-9726)
<http://www.journals.elsevier.com/mechanisms-of-ageing-and-development/>

Course topical outline (subject to change depending on course needs)

Please note that weeks progress more quickly during summer (multiple weeks condensed into 1)

Week 1 (1) Course overview and Theories of aging

Assigned reading: An integrated theory of ageing in the nematode *Caenorhabditis elegans*

(2) Longevity pathways in *C. elegans*

Assigned reading: The Plasticity of Aging: Insights from Long-Lived Mutants

(3) Dietary restriction in *C. elegans*

Assigned reading: (1). The genetics of caloric restriction in *Caenorhabditis elegans* (2). PHA-4/Foxa mediates diet-restriction induced longevity of *C. elegans* (3). Pyruvate imbalance mediates metabolic reprogramming and mimics lifespan extension by dietary restriction in *Caenorhabditis elegans*

Week 2 (1) Dietary restriction in yeast and *Drosophila*

Assigned reading: (1). Regulation of Yeast Replicative Life Span by TOR and Sch9 in Response to Nutrients (2). Regulation of Lifespan in *Drosophila* by Modulation of Genes in the TOR Signaling Pathway

(2) Dietary restriction in mouse and mammals

Assigned reading: (1). Life-Span Extension in Mice by Prewaning Food Restriction and by Methionine Restriction in Middle Age. (2). Rapamycin fed late in life extends lifespan in genetically heterogeneous mice (3). Caloric Restriction Delays Disease Onset and Mortality in Rhesus Monkeys

(3) Mitochondria activity and aging in *C. elegans*

Assigned reading: Mitochondrial Electron Transport Is a Key Determinant of Life Span in *Caenorhabditis elegans*. (2) A mutation in succinate dehydrogenase cytochrome b causes oxidative stress and ageing in nematodes (3). Extension of Life-Span with Superoxide Dismutase/Catalase Mimetics

Week 3 (1) Mitochondria activity and aging in *Drosophila* and mouse

Assigned reading: (1). High-quality life extension by the enzyme peptide methionine sulfoxide reductase (2). Mitochondrial DNA Mutations, Oxidative Stress, and Apoptosis in Mammalian Aging

- (2). Class review
- (3). **Mid-term Exam**

Week 4 (1) IGF signaling pathway in *C. elegans*

Assigned reading: (1) Interacting genes in nematode dauer larva formation (2). A *C. elegans* mutant that lives twice as long as wild type (3) *daf-2*, an Insulin Receptor-Like Gene That Regulates Longevity and Diapause in *Caenorhabditis elegans* (4). *daf-16* integrates developmental and environmental inputs to mediate aging in the nematode *Caenorhabditis elegans*. (5). DAF-16 Target Genes That Control *C. elegans* Life-Span and Metabolism

- (2) IGF signaling in *Drosophila* and mouse

Assigned reading: (1). Extension of Life-Span by Loss of CHICO, a *Drosophila* Insulin Receptor Substrate Protein (2). Extended Longevity in Mice Lacking the Insulin Receptor in Adipose Tissue

- (3). NAD-dependent deacetylase (SIRT) in yeast and *C. elegans*

Assigned reading: (1). Requirement of NAD and SIR2 for Life-Span Extension by Calorie Restriction in *Saccharomyces cerevisiae* (2). Increased dosage of a sir-2 gene extends lifespan in *Caenorhabditis elegans*

Week 5 (1) SIRT in fly and mouse

Assigned reading: (1). Sir2 mediates longevity in the fly through a pathway related to calorie restriction (2). The sirtuin SIRT6 regulates lifespan in male mice

- (2) Autophagy and aging

Assigned reading: (1). Longevity pathways converge on autophagy genes to regulate life span in *Caenorhabditis elegans* (2). Autophagy and Aging: Lessons from *C. elegans*.

- (3) Telomere and aging

Assigned reading: Long lifespan in worms with long telomeric DNA

Week 6 (1) Aging research in humans

Assigned reading: Positional Cloning of the Werner's Syndrome Gene

- (2) class review
- (3). An inter-disciplinary theory of aging

Week 7 **Final Exam**

Assessment

Two written exams (all)	60%
Discussion participation (all)	15%
Paper presentation (graduate)	15%
Paper review	15%
Attendance (all)	10%

Assignment of Grades

Percentage	Grade
93 – 100%	A
90 – 92%	A ⁻
87 – 89%	B ⁺
83 – 86%	B
80 – 82%	B ⁻
77 – 79%	C ⁺
73 – 76%	C
70 – 72%	C ⁻
67 – 69%	D ⁺
63 – 66%	D
60 – 62%	D ⁻
59% or less	F

Policy on absences, makeup tests, late work, and incompletes

Absences for which a medical or court excuse is provided (professional letterhead required) will be recorded but not figured in the attendance grade. Likewise, one absence for which advance notice is given by phone or in person will not be figured in the attendance grade. Any significant tardy or early departure from class will be figured as one absence. Three absences will result in grade F. Students will not be penalized for absences due to participation in University-approved activities, including athletic or scholastics teams, musical and theatrical performances, and debate activities. These students will be allowed to make up missed work without any reduction in the student's final course grade.

Also, note that grades of Incomplete ("I") are reserved for students who are passing a course but have not completed all the required work because of exceptional circumstances. A grade of "I" will only be given under certain conditions and in accordance with the academic policies and regulations put forward in FAU's University Catalog. The student must show exceptional circumstances why requirements cannot be met. A request for an incomplete grade has to be made in writing with supporting documentation, where appropriate.

If a student cannot attend an exam or hand in a homework project on time due to circumstances beyond their control then the instructor may assign appropriate make-up work.

Classroom etiquette policy

University policy on the use of electronic devices states: “In order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cellular telephones and pagers, are to be disabled in class sessions.”

Disability policy statement

In compliance with the Americans with Disabilities Act (ADA), students who require special accommodation due to a disability to properly execute coursework must register with the Office for Students with Disabilities (OSD) in Boca Raton, SU 133 (561-297-3880); in Davie, MOD 1 (954-236-1222); in Jupiter, SR 117 (561-799-8585); or at the Treasure Coast, CO 128 (772-873-3305) and follow all OSD procedures.

Religious Accommodations

Students who wish to be excused from course work, class activities or examinations must notify the instructor in advance of their intention to participate in religious observation and request an excused absence.

Honor Code policy statement

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty, including cheating and plagiarism, 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 at http://www.fau.edu/ctl/4.001_Code_of_Academic_Integrity.pdf

Michelle Cavallo

From: Carolina Clark
Sent: Monday, September 29, 2014 10:43 AM
To: William Brooks; Rodney Murphey
Cc: Keith Brew; Carolina Clark; Marc Kantorow; John Newcomer; David Bjorkman; Michelle Cavallo
Subject: Re: New Biology Course Proposals
Attachments: Spring 15 new course- Adv. Mol. Bio.pdf; Spring 15- New course- Hum. Gen..pdf; Spring 15- New course- Imm. Sem..pdf; Spring 15- New course- Neu.Add..pdf; Biology New Course Proposals.docx

Importance: High

Dear Dr. Brooks and Dr. Murphy,

We have reviewed your new biology course proposals and have no objections to the proposed courses (see attached letter). In turn, we are awaiting your approval/consent letters for our Biomedical Science Graduate Courses, as promised to us last Friday by Dr. Ivy. Could you please provide us the information no later than Wednesday, as we must submit all agenda items to UGPC by October 1st? For your convenience, I have attached the course proposals to this email.

Thanking you in advance for your assistance and understanding in this time-sensitive matter.

Sincerely,

Carolina Clark
Graduate Programs Coordinator
Charles E. Schmidt College of Medicine
777 Glades Road, Rm. 206-A
Boca Raton, FL, 33431-0991
561-297-4549
clarkc@fau.edu
www.med.fau.edu

From: Michelle Cavallo <MCAVALLO@fau.edu>
Date: Tuesday, September 23, 2014 at 12:52 PM
To: Keith Brew <KBREW@fau.edu>
Cc: William Brooks <wbrooks@fau.edu>, Carolina Clark <clarkc@fau.edu>
Subject: New Biology Course Proposals

Dear Dr. Brew,

The Biology Department is attempting to formalize a number of graduate and undergraduate level courses which have previously been offered under the special topics course code. Each course has been offered at least once and half of the courses on the list have run in excess of four times (the range being 1 to 8 semesters offered). Because these courses have been successful with our students (enrollment has been consistently high), we would like to have them formally recorded in the university catalog.

In order to do so, I am filling out new course proposal forms and under the "Please consult and list departments that might be affected by the new course and attach comments" box, Dr. Randy Brooks, as Chair of our Departmental Graduate Program Committee, suggested I list the Biomedical Science Department. He instructed me to contact you and request email confirmation that your department has no objections to the proposed courses.

The new course proposals and associated syllabi are attached for your review and listed below. Courses marked with an asterisk below are courses which we are proposing to dual list at both the graduate and undergraduate levels. All other courses on the list are proposed only at either the graduate (G) or the undergraduate (UG) level at this time and all courses are labeled by level.

1. (G) Computer Graphics for Biologists (BSC 6466)
2. (G) Methods in Biotechnology (BSC 6468L)
3. *(G) Advanced Plant Biotechnology and Lab (BSC 5467C)
4. *(UG) Genetics Lab (BSC 4007L)
5. *(G) Advanced Genetics Lab (BSC 5038L)
6. *(UG) Molecular Genetics of Aging (BSC 4022)
7. *(G) Advanced Molecular Genetics of Aging (BSC 5029)
8. (UG) Life of a Scientist
9. (UG) Introduction to Honors I
10. (UG) Introduction to Honors II
11. (G) Practical Cell Neuroscience
12. (G) Human Neuroanatomy
13. (G) Neurophysiology
14. (G) Advanced Neurophysiology

The Advanced Plant Biotechnology and Lab, Methods in Biotechnology, and Practical Cell Neuroscience courses listed above already exist as undergraduate level courses in the catalog and, in these two cases, we are simply adding a graduate version of each of the existing courses. (Methods in Biotechnology is the graduate level equivalent to undergraduate level Biotechnology I and II Laboratory courses combined).

In perusing the university catalog, we were not able to identify any apparent direct course conflicts within your department but we would appreciate it if you would respond an email with your comments and the comments of any faculty within your department who teach related courses. Thank you very much for your time.

Regards, Michelle

Michelle Cavallo
Administrative Assistant & Graduate Coordinator
Department of Biological Sciences
Florida Atlantic University
777 Glades Road
Boca Raton, FL 33431
PH: 561-297-0384



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(561) 297-0706
Fax: (561) 297-2519

Monday, September 29th, 2014

To: Charles E. Schmidt College of Science
Biology Department

To Whom It May Concern,

The Biomedical Science Graduate Program in the Charles E. Schmidt College of Medicine has reviewed the new Biology course proposals, and does not have any objections to the proposed courses. The courses do not contain any material that could constitute a conflict with our program curriculum.

Sincerely,

A handwritten signature in black ink that reads 'Marc Kantorow'. The signature is written in a cursive, flowing style.

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

From: [Kailiang Jia](#)
To: [Michelle Cavallo](#)
Cc: [William Brooks](#)
Subject: RE: Your new course proposals
Date: Monday, October 20, 2014 3:35:45 PM

Hi, Michelle,

Here is the information.

1. online materials for the course Advanced Genetics Lab

<http://www.wormbook.org/>
<http://www.wormbase.org/>
<http://flybase.org/>

2.. online materials for the course Advanced Molecular Genetics of Aging

<http://www.nia.nih.gov/health/featured/healthy-aging-longevity>
[http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1474-9726](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1474-9726)
<http://www.journals.elsevier.com/mechanisms-of-ageing-and-development/>

If additional information is required, please let me know. Thanks for your help.

Kailiang

From: Michelle Cavallo
Sent: Monday, October 20, 2014 12:50 PM
To: Kailiang Jia
Cc: William Brooks
Subject: Your new course proposals

Hi Kailiang,

The College Curriculum Committee reviewed your Advanced Genetics Lab (BSC 5038L) and your Advanced Molecular Genetics of Aging (BSC 5029) course proposals on Friday and they have approved them but they have suggested that you provide to the department a listing of the online course materials which your syllabi indicate substitute for textbooks associated with these courses. It was stated that the University level committees (the next level of review) may wish to see this information and could choose not to approve the courses until such time as those details are provided.

Please provide me with a list of those materials no later than Friday, October 24th and I will update the proposals and forward them back to the committee so that they may send them on to the University level review.

Thanks,

Michelle

Michelle Cavallo

Administrative Assistant & Graduate Coordinator
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Florida Atlantic University
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Boca Raton, FL 33431
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