Biodemography of Aging – GERO/BISC 440
Syllabus - 2016 Spring Semester

1. Basic Information

Course:	Biodemography of Aging – GERO/BISC 440
Place and time:	GERO 224, Monday 2-4:50pm
Faculty:	Dr. Sean P. Curran Assistant Professor, Gerontology Assistant Professor, Molecular and Computational Biology
Office:	GERO 306E
Telephone:	213-740-5354
Email:	spcurran@usc.edu
Office Hours:	Monday 1pm
Prerequisites:	none
Class web page:	https://blackboard.usc.edu
Units:	4
Course text:	"Biology of Aging" by Rodger B. McDonald
Teaching Assistant:	Jackie Lo
Email:	jacqueline.lo@usc.edu

2. Classroom policy

This course will discuss current research in the field of healthy aging, the biology of age-related disease and longevity. The material will be discussed in both lecture and student presentations. As such attendance is mandatory. All electronic communication devices (phones, blackberries, and similar) must be turned off, and no instant messenger/chat type programs are allowed in class.

Statement for Students with Disabilities

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m.–5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

Statement on Academic Integrity

USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own.

All students are expected to understand and abide by these principles. Scampus, the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A: http://www.usc.edu/dept/publications/SCAMPUS/gov/. Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at: http://www.usc.edu/student-affairs/SJACS/.

3. Course goals and learning objectives

The main goal of this course is to introduce students to the concepts of molecular and genetic regulation of healthy aging, lifespan, and age-related diseases.

The only pre-requisite for this course is scientific curiosity. Students are not expected to know anything specific about molecular biology or genetics. This class is not meant to teach advanced molecular biology or genetics (such classes are already in existence). The emphasis in this course is on practical implementation of scientific concepts.

Specifically, we will learn:

- Why the study of lifespan is important and societal views on the biology of aging and age-related diseases
- How genes that modulate lifespan have been identified using model systems.
- Which biological pathways most potently influence lifespan and discuss the molecular mechanisms underlying this regulation.
- Implications of current research on future studies of human lifespan and age-related diseases.
- Most importantly, this class will provide students the means to break down a scientific hypothesis into its fundamental elements and critically analyze the validity of current theories and dogmas in the field.

4. Course plan

Suggested readings listed are from "Biology of Aging" course textbook and should be done before the lecture as background material.

January 11th

Introduction to the study of Gerontology, syllabus, grading policy, overview of scientific writing expectations for class. How to write an Op-Ed

January 18th

MLK Day –NO CLASS

January 25th

READING: Preface, Chapter 1 and Chapter 2

- Why the study of aging is important to your future
- Introduction to the study of aging and age-related disease
    - Human life expectancy
    - Demography of aging

February 1st

READING: Chapter 5

Review of Basic Molecular Biology, Genetic, and Physiology concepts
Multimedia presentation - Movie #1

February 8th

READING: Chapter 4 (Pgs. 81-94 and 110-116)
Op-Ed Paper #1 (on Movie #1) Due
Telomeres, DNA Damage, Hayflick limit, cancer

February 15th

Presidents Day – NO CLASS

February 22rd

Stem cells, protein turnover, the proteasome, immune system
Multimedia presentation - Movie #2

February 29th

READING: Chapter 5 Chapter 10 (pgs. 305-321)
Op-Ed Paper #2 (on Movie #2) Due
Dietary Restriction, Nutrition, and nutrient signaling pathways

March 7th

Midterm Exam

March 14th

Spring Recess – NO CLASS

March 21st Discussion of recent research findings appropriate for group presentations and paper topics.
Multimedia presentation - Movie #3

March 28th
READING: Chapter 4 (Pgs. 95-110)
Op-Ed Paper #3 (on Movie #3) Due
Mitochondria, energy homeostasis, and ROS

April 4th
Development growth, reproduction pathways
Multimedia presentation - Movie #4

April 11th
READING: Chapter 8 and 9
Op-Ed Paper #4 (on Movie #4) Due
Progeria, Aging and disease

April 18th
READING: Chapter 3
5-Page paper due
Identifying and challenging Aging Theories
Past, Current and Future Theories

USC What's Hot in Aging Research (9:30-4:30pm)
Attendance at What's Hot in Aging at the Davis School of Gerontology (FREE REGISTRATION FOR ENROLLED STUDENTS). Must attend/watch any 3 talks (~20min each) at anytime during the day. The event goes from 9am-4:30pm. Event is usually recorded for later viewing. You will need to write a 1-page paper discussing the talks you observed. What did you like, what would you have liked to see? What is the next step in the research topic?

April 25th
Group presentations on scientific papers
Op-Ed Paper #5 (on What's Hot in Aging) due

Final Exam
Monday May 2th - Exam will be posted on Blackboard
Take home due on the scheduled Final Exam Day/Time

Monday May 9th – Final Exam Due at 4pm!!!
Must be uploaded onto Blackboard before 4pm. NO EXCEPTIONS!!!

5. Assessment
Grades are based on five scores: 1) Participation. 2) There will be four multimedia presentations that relate to the scientific material presented. Students will write a

one-page Op-Ed relating the course material to the presentation. 3) midterm exam. 4) group presentation consisting of a 30 minute talk including slides where the students describe and lead a discussion of a current research paper in the field and provide a written summary of that paper 5) final exam.

Assessment Procedure	**Percent**
Participation (50 points)	10%
Op-Eds (20 points each, 5 summaries = 100 points total)	20%
Midterm Exam (100 points)	20%
Group Presentation of scientific papers (40 points presentation and 10 points participation in class discussions, 50 points written summary, 100 points total)	20%
Final Exam (150 points)	30%
Total = 500 points	100%

5.1. Criteria for grading:

1. Participation is assessed by attendance (mandatory) and participation in class discussions.

2. Written summaries are 1-page in length and should discuss your opinion of an issue from the presentation as it relates to the course material. There are no "right" answers but you must support your opinion with two scientific references (not including lecture material). What is the topic? Why is it important? What is your opinion or hypothesis? What is the evidence to support your opinion? What is the evidence against your opinion and why are you right? You **MUST** take a stance on the topic.

3. The midterm and final will be open book exams with short answer responses.

4. The final presentation will be graded according to clarity of the presentation. The written summary should be organized in a similar manner to the 1-page summaries with regard to content. They should be more heavily referenced and thorough discuss your interpretation of the paper you are presenting.

Students who are not able to meet deadlines due to medical or other emergency must notify the instructor immediately.

5.2. Course grade: Letter grades will follow a standard scale but at the discretion of the instructor, may be weighted based on the average of the course. 90% and above leading to A, 80-90% leading to B, etc. Pluses and minuses are assigned by dividing each range in corresponding halves (A, A-) or thirds (B+, B, B-, C+, ...).

6. Policy against Cheating

We follow a zero tolerance policy: any student engaging in cheating will fail the course. All USC students are responsible for reading and following the Student

Conduct Code, which appears in the Scampus and at http://www.usc.edu/dept/publications/SCAMPUS/goverance.

This policy does not apply to discussion or exchange of ideas. On the contrary, such interactions represent an important way to thoroughly understanding complex questions in molecular genetics.

Students must write their own papers. All written assignments will be turned in through blackboard and analyzed for plagiarism.

7. Disability Policy Statement:

Any Student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. The phone number for DSP is (213) 740-0776.

8. Resources

8.1. Web page: A class website will be setup on Blackboard containing information about the course: syllabus, laboratory handouts, grades, miscellaneous information about weekly class activities, and an email directory of all people in the class. Use it as much as you find it useful. The web page can be accessed through the main stem https://Blackboard.usc.edu.

8.2 Office Hours: Office hours will be held weekly. Time and location for my office hours are at the beginning of the syllabus. I am always available by email to help you as much as you need.