

Biodemography of Aging – GERO/BISC 440

Syllabus - 2019 Spring Semester

1. Basic Information

<i>Course:</i>	Biodemography of Aging – GERO/BISC 440
<i>Place and time:</i>	GERO 224, Monday 2-4:50pm
<i>Faculty:</i>	Dr. Sean P. Curran Associate Professor, Gerontology Associate Professor, Molecular and Computational Biology
<i>Office:</i>	GERO 306E
<i>Telephone:</i>	213-740-5354
<i>Email:</i>	spcurran@usc.edu
<i>Office Hours:</i>	Always available before and after lecture and anytime by appointment.
<i>Prerequisites:</i>	none
<i>Class web page:</i>	https://blackboard.usc.edu
<i>Units:</i>	4
<i>Course text:</i>	“Biology of Aging” by Rodger B. McDonald
<i>TA</i>	Chia-An Yen; chiaanye@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.

Week of January 7th

- Introduction to the study of Gerontology, syllabus, grading policy, overview of course expectations.
- Strategies and rubrics for writing powerful and accessible Op-Ed pieces.

Week of January 14th

READING: Preface, Chapter 1 and Chapter 2

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

Week of January 21st

MLK Day –NO CLASS

Week of January 28th

READING: Chapter 5

Review of Basic Molecular Biology, Genetic, and Physiology concepts

Hierarchy of the body

Multimedia presentation - Movie #1

Week of February 4th

READING: Chapter 4 (Pgs. 81-94 and 110-116)

Op-Ed Paper #1 (on Movie #1) Due

DNA maintenance and Cellular Proliferation: Telomeres, DNA Damage, Hayflick limit, cancer

Week of February 11th

Cellular Rejuvenation: Stem cells, protein turnover, the proteasome, immune system

Multimedia presentation - Movie #2

Week of February 18th

Presidents Day – NO CLASS

Week of February 25th

READING: Chapter 5 Chapter 10 (pgs. 305-321)

Op-Ed Paper #2 (on Movie #2) Due

Nutrition: Dietary Restriction and nutrient signaling pathways

Week of March 4th

Midterm Exam – In class (2-4pm, no exceptions)

A laptop is required and can be provided if needed - Please tell me (in person or by email) by 02/25/18 if you will need one.

Week of March 11th

Sign up for group presentations

Spring Recess – NO CLASS

Week of March 18th

READING: Chapter 4 (Pgs. 95-110)

Energy Homeostasis: Mitochondria and ROS

Week of March 25th

Multimedia presentation - Movie #3

Week of April 1ST

USC What's Hot in Aging Research (9:30-4:30pm)

Meet in Gerontology Auditorium at normal class time (You MUST - Check in at desk for attendance).

*Attendance at What's Hot in Aging at the Davis School of Gerontology (FREE REGISTRATION FOR ENROLLED STUDENTS). **Must watch** any 3 talks (~20min each) at anytime during the day. The event goes from 9am-4:30pm. 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? (This is due at the end of the course)*

Op-Ed Paper #3 (on Movie #3) Due

Week of April 8th

READING: Chapter 3

Theories, predictions, and hypotheses: Identifying and challenging current Aging Theories. Past, Current and Future Theories

Week of April 15th

READING: Chapter 8 and 9

Premature Aging: Progeria versus Aging and disease

Multimedia presentation - Movie #4

5-Page paper due

Week of April 22nd

Group presentations on scientific papers

Op-Ed Paper #4 (on Movie #4)Due

Friday April 26th

Final Exam will be posted on Blackboard

Take home examination that is due on the scheduled Final Exam Day/Time

Monday May 6th

Final Exam Due at 4PM!!!

Must be uploaded onto Blackboard before 4PM. NO EXCEPTIONS!!!

Op-Ed Paper #5 (on What’s Hot in Aging) Due

ALL EXTRA CREDIT DUE

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 15-20-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
Op-Eds (10 points each, 5 assignments = 50 points total)	12.5%
Midterm Exam (100 points)	25%
Group Presentation of scientific papers (50 points), 5-page written summary (50 points), = 100 points total	25%
Final Exam (150 points)	37.5%
Total = 400 points	100%

Extra credit will be made available throughout the semester. Students are encouraged to take advantage of these opportunities.

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 fully support your opinion with at least **two scientific references** (not including lecture material).

To receive full credit you must:

(3 points) Clearly define your opinion, hypothesis, and position. This includes a brief introduction to the topic and statement/support as to why it is important?

(6 points) Clearly provide the evidence to support your opinion and explain HOW this supports your position - Need two from source material [movie, art, lecture, etc.] and two scientific/peer reviewed supporting material. You **MUST** take a stance on the topic and explain how the evidence provided supports that stance.

(1 points) – Summarize and state the current state of the field and what the future holds or what is needed to advance 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 your portion of the presentation.
5. 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 thoroughly discuss your interpretation of the paper you are presenting. It is not a book report, which means you do not need to rewrite the paper you are presenting. Instead, you should analyze the paper and expression your opinion of the work.

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 and will be reported to the USC Student Judicial Affairs and Community Standards. All USC students are responsible for reading and following the Student Conduct Code.

<https://sjacs.usc.edu/students/academic-integrity/>

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.