

University of Southern California

GERO 499 Syllabus

Fundamental Foods in Aging

Spring 2024

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Class meeting time: GER (room) Monday and Wednesday 4:00 - 5:40 PM Pacific Time.

Office Hours: By Appointment (email preferred)

Class Description: Dietary restriction is one of the most common tools to reduce the risk of age-related illnesses such as diabetes, cardiovascular, and some neurodegenerative diseases. This course covers various aspects of foods that are functional to support healthy aging, including topics around popular diets and supplements that alter cellular pathways that impact aging. There will also be additional discussions that highlight novel discoveries and cutting-edge research applications that intersects the impact of nutrition and aging.

Course Objectives: The primary aim of this class is to provide an introduction on biological aging and the impact that foods have on intracellular pathways and whole-body metabolism. At the end of this course students will be able to comprehend and provide opinions regarding the body's adaptation of diet to support healthy aging.

Learning Strategies

The learning objectives will be accomplished by means of several strategies, including-but not limited to- the following:

- attending seminar lectures
- participating in Q&A discussions
- preparing and delivering a research presentation
- preparing and delivering a research proposal (Specific Aim Page)

Date	Class Topic	Material
01/8/2024	Orientation Lecture 1: Introduction to Fundamental Foods and Healthy Aging.	<ul style="list-style-type: none">– Cover class structure and syllabus.– Overview of the optimal aging.– Significance of foods that impact general health.– Pre-course test
01/10/2024	Lecture 2: Biology of Aging	<ul style="list-style-type: none">– Overview of aging cell biology.– Overview of research models to study aging– Biological hallmarks of aging.
01/15/2024	MLK DAY	

01/17/2024	Lecture 3: The Power of Nutrition	<ul style="list-style-type: none"> - Nutrition - Lifestyle - Exercise - Supplement - How are we using research to help society?
01/22/2024	Lecture 4: Impact of Macronutrients on healthy aging	<ul style="list-style-type: none"> - Guidelines for Healthy Eating - Diet versus Nutrient - Carbohydrates, Fats, and Protein - Current Research on Nutrition and Lifespan
01/24/2024	Lecture 5: Micros role on supporting healthy aging	<ul style="list-style-type: none"> - Vitamins and minerals - Antioxidants
01/29/2024	Lecture 6: Designing a Research Project Exam 1 :In class (Lecture 2-5)	<ul style="list-style-type: none"> - Relevance/Background - Aims - Hypothesis - Methods, Approach, Experiments, Pitfalls - Finding your niche
01/31/2024	Lecture 7: Developing your Niche for Research	<ul style="list-style-type: none"> - Reading papers - Talk to mentors and peers - Research the competition
02/5/2024	Lecture 8: Food Production and Community	<ul style="list-style-type: none"> - Conventional Foods - Modified Foods - Organic Foods
02/07/2024	Lecture 9: Student Presentations	<ul style="list-style-type: none"> - Student presentations
02/12/2024	Lecture 10: Hydration	<ul style="list-style-type: none"> - Electrolytes - Roles of mineral intake on aging - Cardiovascular health
02/14/2024	Lecture 11: Student Presentations	<ul style="list-style-type: none"> - Student presentations
02/19/2024	Lecture 12: Adaptogens	<ul style="list-style-type: none"> - Pros and cons - When to avoid - Mushrooms, why are they so popular? - CBD, why is considered an adaptogen?
02/21/2024	Lecture 13: Popular Adaptogens during COVID	<ul style="list-style-type: none"> - Elderberry - Botanicals - doi: 10.3390/ph15030345
02/26/2024	Lecture 14: Student presentations	<ul style="list-style-type: none"> - Student presentations

02/28/2024	Lecture 15: Student Presentations	<ul style="list-style-type: none"> – Student presentations
03/04/2024	Lecture 16: Adaptation to darkness: A case for Melatonin	<ul style="list-style-type: none"> – Biological source – Commercial source – Neuroendocrine functions – Roles in chronic illness (i.e. CVD)
03/06/2024	Lecture 17: Student Presentations	<ul style="list-style-type: none"> – Student presentations
03/11/2024	Lecture 18: Gut Homeostasis	<ul style="list-style-type: none"> – Absorption – Mucosal function – Food that compromises digestion – Gut dysfunction during aging – Probiotics – Prebiotics – Spices, Roots and Leaves
03/18/2024	Lecture 19: Student Presentations Health 2nd Handout for Final Assignment to develop a Research Project (Aims Page)	<ul style="list-style-type: none"> – Student presentations
03/20/2024	Spring Recess	Sun-Sun (March 10-17)
03/25/2024	Lecture 20: Diet Interventions	<ul style="list-style-type: none"> – Overview of traditional and fad diets – How pop media supports theory to improve aging.
03/27/2024	Lecture 21: Calorie Restriction and Aging	<ul style="list-style-type: none"> – The golden standard paradigm – Variations of CR on health – Specific tissue response to CR during aging
04/01/2024	Lecture 22: Student Presentations	<ul style="list-style-type: none"> – Student presentations
04/03/2024	Lecture 23: Fasting Mimicking Diets	<ul style="list-style-type: none"> – Intermittent Fasting – Periodic Fasting – Every other day – Clocking your health with fasting- adapting for healthy aging
04/08/2024	Lecture 24 : Student Presentations	<ul style="list-style-type: none"> – Student presentations
04/10/2024	Lecture 25: Ketogenic Diet	<ul style="list-style-type: none"> – Discovery for epilepsy – Various types (keto vs ketogenic)

		– What are the rules for keto
04/15/2024	Lecture 26: Student Presentations	– Student presentations
04/17/2024	Lecture 27: Dietary Protein Intake	– Content on metabolic health – Pros and Cons during use of isolated protein – Impact on frailty and muscle mass
04/22/2024	Lecture 28: Student Presentations	– Student presentations
04/24/2024	Lecture 29: Exam 2 :In class Lectures 20-27 Final Session to discuss final assignment to develop a Research Project (Aims Page)	– Clear up any questions, regarding inquires for formatting for Aims page – Review details and guidelines
04/29/2024	Study Days	Sat – Tues. (April 27-30)
05/02/2024	Final Exam Due (TBA)	Wed- Wed (May 1- 8)

Grading:

*****Note all deadlines are at 5:00 PM pacific time, NOT MIDNIGHT. If you submit past 5:00PM pacific time, your grade will be cut in half from total of possible points.**

Attendance (Bonus Extra 5%): Attendance to class is not mandatory, but attendance and participation in class will be considered extra credit. For those who attend all classes and participate during class discussions, this will boost your final grade. For those attending class asynchronously, you can obtain extra credit by submitting discussion posts on blackboard – 2-3 sentence write-ups about what you’ve learned in each lecture will suffice.

Your grades will be determined based on your performance for the following class materials:

A weighted average of all your classroom materials will be calculated based on how well you do in each assignment at 10%, 20%, 30%, and 40% of your final grade. For example, if you score the highest on exam 1, it will count as 40% of your final grade and if you score the lowest on your term paper, it will count as 10% of your grade, etc.

Specific Aims Page: 50%

Each student will write a term paper on one of the following topics:

1. Pick an “anti-aging” adaptogen (Lectures 10-18). You must refer to at least one physiological system we have covered in class regarding to impact on healthy aging.
2. Develop a short background/relevance of the topic and expound on the reported limitations (peer reviewed reports) of your selected adaptogen and develop a hypothesis using the hallmarks of aging from Lecture 2. You may also include research models of aging to add merit to your experimental approach.

3. Submit a request for a personal topic. **All personal topics must be approved by 3/18/2024.**

The Aims page should include sufficient background and introduction on the topic, what is currently known in the field, and provide justification for why it is an important topic. For those suggesting a therapeutic intervention, you must discuss a feasible therapeutic intervention and describe how you might design an experiment to test this intervention. The Aims Page cannot exceed 2 pages, arial, 11-point font, single-spaced, 0.5-inch margins. There is no penalization for using less than 2 pages as long as the required materials are all present, but any submission exceeding the allotted space or using smaller fonts or margins will get an immediate failure without opportunity for a revision. All documents must be submitted as a Microsoft Word document or equivalent. References can be put on a separate page and do not have any space limitations. Students will be graded on innovation, feasibility, and clarity. While grammar will generally not be a focus of grades, major errors in grammar/punctuation that make the material incomprehensible will affect the grade. Absolutely no late work will be accepted under any circumstances, but students can submit their term paper earlier than the due date. All term papers are due **by 5/X/2023 at 5:00 PM pacific time.**

Presentations: 30%

Each student will do a short, 8-10-minute presentation for their selected lecture on the following lecture day. Students are free to present in any style of their choosing, but should generally provide background, rationale/justification, potential experiments, and expected results. Presentations will be timed. While there is no minimum requirement for time, there will be a hard stop at 8-10 minutes, followed by Q&A. The students will be graded on slide quality, presentation quality, clarity, and ability to field questions. Students attending classes asynchronously can provide a zoom or camera-recording of their presentation. Students are allowed to work in groups of up to 2-3 people for presentations, but keep in mind that separate and unique topics papers must be presented by each student.

Exams: 10% (two exams for a possible total of 20%)

There are two in class exams that will be dispersed on 01/29/2024 and 04/24/2024. You will have 2 days complete each exam. Each exam will contain at least 7 questions and you are required to choose 4 questions to answer. Your exam must be submitted as a Microsoft Word document or equivalent and must be written in 1-page arial, 11-point font, single-spaced, 0.5-inch margins. There is no penalization for using less than 1 page as long as the required materials are all present, but any submission exceeding the allotted space or using smaller fonts or margins will get an immediate failure with no chance for a revision. Absolutely no late work will be accepted under any circumstances. Exams are due at 5:00 PM pacific time 2 days after are dispersed (01/29/2024 and 04/24/2024).

Prerequisites:

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 instill, instruct, and advance (such classes are already in existence) your thoughts in healthy aging. The emphasis in this course is on practical implementation of scientific concepts into the biology of aging.

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/>.

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.

Disability Policy Statement:

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Resources:

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>.