Health and Aging

Day and times: Tuesday 9-11:50

Class documents are available on Blackboard.

Scheduled Course Exams:
- Midterm – March 29th
- Final – Tuesday May 8th – 8-10 AM

Instructors:
- Professor Eileen M. Crimmins 213-740-1707
  218D Andrus Gerontology Center crimmin@usc.edu
  Office Hours: Tuesday 1-2; or by appointment
- Professor Caleb Finch 213-740-1756
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  Office Hours: Thursday, 10-11; or by appointment

Course Description: This course is a seminar intended for Ph.D. and postdoctoral students with an interest in health issues affecting older persons. The course examines changes in health related to age, changes in health in populations over time, and the key health issues facing older persons. Students will be expected to master issues in the biology and biodemography of aging based on an interdisciplinary bio-psycho-social approach.

Course Objectives: At the end of the course the student will:

1. Be able to knowledgeably describe the major health problems affecting people of different ages and in different cohorts. The student will have detailed knowledge about the causes of a number of major health problems of middle age and older adulthood.

2. Understand how evolutionary forces shape age structures and health characteristics of populations.

3. Have knowledge of the biological, social, behavioral and psychological factors and mechanisms relate to a number of specific health outcomes.

4. Have knowledge of methods and issues faced in doing research on health using both a biological and a psychosocial perspective on health.

Class Format: The class will focus on discussion of the current state of knowledge in areas relevant to health. Class meetings should be participatory. All students should have read the assigned material before the class and be prepared to discuss the material. If in reading papers, you find gaps in your knowledge, you should fill in with textbooks and sources that fill these gaps. Individual students will be assigned to lead the discussion of class readings.

This class fulfills a basic requirement in the Ph.D. curriculum in Gerontology and is intended to provide some students with an opportunity to discuss topics that could be covered on the qualifying exam. Students should use the opportunity of the class to prepare themselves for questions in the areas of health and biology.
Class members should be looking for current research findings and news items with relevant material. Sharing of relevant current material with other class members is an important part of learning. This class should prepare students for thoughtful and critical evaluation of health and longevity.

**Assignments and Grading:** Members of the class will be expected to prepare a weekly 2 page answer (including references, 11 pt font, ½ inch margins) to a question of the day for 10 class days. Questions are listed before the readings for each week. Use the 2 pages to provide and answer with a clear point of view and end by indicating what research needs to be done to provide a definitive answer.

Students will be responsible for preparing to present important points from the reading material in class. Each student should be prepared to actively participate and to expect to be fully prepared for each class.

There will be two tests. Questions on tests will generally be short answer essay questions similar to those that have been prepared for each week or analytic problems. They will include questions on readings, course lectures, and class discussion.

The 10 papers will be worth 30 points and the class participation will be worth 20 points. Each of the tests will be graded as 25 points.

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs each semester. A letter of verification for approved accommodations must be obtained from Disability Services, and delivered to the instructors as soon as possible. Disability Services is located at STU 301, phone 213-740-0776.

**Reading Material:** Most of the reading material for this class is available on Blackboard. We have selected material that is available to you through USC’s electronic resources. Many of them can be gotten directly from the source but we have made it easier to find them by putting them on the website. Additional readings on the website are either not copyrighted (e.g. US Government publications) or they were written by one of the instructors.

An additional reference is available in the Bookstore:
**Class Schedule**

Class 1 - January 9 – Overview of Course
  Introduction to Biological Theories of Aging and Sociodemographic Models of Aging

Class 2 - January 16 – Mortality in human and Other Populations

Class 3 - January 23 – Evolution of Longevity and Life History

Class 4 – January 30 – Healthspan and determinants in Populations

Class 5 - February 6 – Lifecycle Influences on Health: Inflammation, Infection and Longevity

Class 6 - February 13 – Genetics of Longevity

Class 7 - February 20 – Influences of Social Environment, Socioeconomic and Race/Ethnic Differences on Aging (Finch out)

Class 8 – February 27 - Cardiovascular Disease and Aging

Class 9 - March 6 – **Midterm exam**

**Spring Break March 13**

Class 10 - March 20 - Cognition and Aging

Class 11 - March 27 – Gender Differences in Aging, Sex Hormones and

Class 12 - April 3 – Health Behaviors: Obesity. Exercise and Alcohol and Aging

Class 13 - April 10 – Physical Environments and Aging

Class 14 - April 17 – Biomarkers of Stress, Health and Aging.

Class 15 – April 24 – Aging and Longevity in the Future

**Final Exam – May 8th - 8-10 AM**
Reading Assignments

Class 1 Jan 9 Introduction and Overview of course

The Biology of Aging and Sociodemographic Models of Aging, Crimmins & Finch

Melov S. 2016. Geroscience approaches to increase healthspan and slow aging. F1000Res. pii: F1000 Faculty Rev-785. PMID: 27158475;


Class 2 Jan 16, Mortality in Populations (Human & other species), Crimmins & Finch

Question: How do biological and sociodemographic theories or models explain age patterns of mortality?


Class 3 Jan 23, Evolution of longevity and life history, Finch

Question: Why do mice live 3 years and humans 90?

Ricklefs and Finch 1995 AGING: A NATURAL HISTORY, Ch. 7, Evolution of Aging.


Class 4 Jan 30, Healthspan in Populations, Crimmins & Finch

**Question:** How is it possible to have lengthening life and deteriorating health at the same time?


Class 5 Feb 6, Lifecycle Influences on Health: Inflammation, Infection and longevity

**Crimmins & Finch**

**Question:** How could the links between early life and late life health change over time?


Belsky DW et al. 2017. Impact of early personal-history characteristics on the Pace of Aging: implications for clinical trials of therapies to slow aging and extend healthspan. Aging Cell. 16:644-651


Class 6 Feb 13, Genetics of Longevity and Health, Finch

**Question:** How important are genetic factors in human longevity?


Class 7 Feb 20, Socioeconomic Factors, Race and Health Outcomes, Crimmins

**Question:** How do race and SES intersect to affect health change with age?


Class 8 Feb 27, Cardiovascular Disease and Aging, Crimmins & Finch

**Question:** What biological, social, and behavioral factors are important risk factors for CVD?


Paynter, N. et al. 2010. Association Between a literature Based Genetic Risk Score and Cardiovascular Events in Women JAMA;303(7):631-637


Class 9 – Mar 6: Midterm Exam

March 13 – Spring Break

Class 10 - March 20, Cognition and Aging, Crimmins & Finch

**Question:** The Age 60 Rule: the FAA requires commercial pilots to retire at age 60. Is this justified?


Finch CE. 2009. The neurobiology of middle-age has arrived. Neurobiol Aging. 30:515-20;


Class 11 Mar 27, Gender Differences in Aging and Sex Hormones as an Intervention into Aging, Crimmins & Finch

Question: What are the biological & social underpinnings of gender differences in health and mortality

Class 12 April 3, Diet, Exercise, Alcohol and Aging, Crimmins & Finch

Question: What behaviors do you recommend for optimizing to live a long and healthy life?

Class 13 - April 10, Physical Environment and Aging, Crimmins & Finch

Question: How may climate change impact future health among the aged?
Cacciottolo et al 2017. Particulate air pollutants, APOE alleles and their contributions to cognitive impairment in older women and to amyloidogenesis in experimental models. Transl Psychiatry. 7(1):e1022. PMID: 28140404;
Class 14 April 17, Biomarkers of Stress, Health and Aging, Crimmins & Finch

**Question:** How good are predictions of life expectancy from biomarkers at these three levels: molecular, cell, and organ function?

Belsky DW et al. 2015. Quantification of biological aging in young adults. PNAS 112:E4104-10


McEwen BS, Morrison JH. 2013. The brain on stress: Vulnerability and plasticity of the prefrontal cortex over the life course. Neuron. 79:16-29


Class 15 April 24, Aging and Longevity in the Future: Finch

**Question:** What is your personal goal for longevity and why?


