

**California State University, Los Angeles, Dept. of Biological Sciences  
Biology of Human Aging, BIOS 384N, Class # 11476, Section 2  
Winter Quarter, 2010**

Thursdays 6:10 pm – 10:00 pm  
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Office: BS 120, (323) 343-2084  
Office Hours: T, W, R: 2:00-4:00 pm  
or by appointment

Course Description: This course centers around the major physiological and anatomical changes that occur during aging (~ > 55 years of age) at all levels of biological organization: biochemical, organelle, cellular, tissue, organ, organ system, and organism. Changes during healthy aging will be distinguished from those due to common late-onset diseases. This course is an upper-division science course for General Education Theme F. Human Maturity and Aging Processes and Problems.

Prerequisite: BIOS 155 – Natural History of Animals (or the equivalent).

Textbook: None. The textbook that I have been using for several years is now out of print. Rather, you will have to depend on my course notes, compiled from several different sources, including the textbook that is now out of print:

Class Notes: **Chen, M. J.** This is a packet of my lecture notes so that you can listen and fill in ancillary material without madly writing down everything. I *highly* recommended that you get these.

SCHEDULE

<u>Date</u>	<u>Topic</u>
Jan 7	Introduction, General Principles of Anatomy and Physiology,
Jan 14	Demographics, Life Expectancy and Research Methods, Molecular and Cellular Theories of Aging; Homeostasis
Jan 21	Integumentary System, Circulatory System, Respiratory System
Jan 28	MIDTERM EXAM 1
Feb 4	Nervous System and Sense Organs – Eyes, Ears REFERENCE LIST FOR TERM PAPER DUE FIRST ARTICLE SUMMARY DUE
Feb 11	Muscular System, Skeletal System
Feb 18	MIDTERM EXAM 2 (material since Midterm 1) SECOND ARTICLE SUMMARY DUE
Feb 25	DRAFT OF TERM PAPER DUE IF YOU WANT Digestive System, Diet and Nutrition

Mar 4	Urinary System, Reproductive System
Mar 11	TERM PAPERS DUE! Endocrine System, Immune System
Mar 18	FINAL EXAM (material since Midterm 2) 7:30 pm – 10:00 pm

### Course Requirements

Midterm Exam 1	75 points
Midterm Exam 2	75 points
Article Summaries (2)	20 points each
Term Paper	125 points
Reference List	20 points
Final Exam	75 points
Attendance	27 points at 3 points per class
Quizzes (3)	10 points each
Total	467 points

### Final Course Grades

Final grades will be on a percentage or on a curve, depending on the general overall performance of the class. However, this does not apply to scores hovering at about 230 points or lower. All scores near or lower than 230 points will be considered failing. I reserve the right to assign “+” and “-“ grades as well as full grades. I also reserve the right to change the above course requirements slightly.

#### *Exams*

The midterm exams and final exam will include multiple choice questions, short answer questions, and short essay exam questions. Students are expected to attend the lectures.

#### *Quizzes*

My use of quizzes is fairly new to this course; the purpose is to get you to learn the material and to attend the *entire* lecture. Too often, after the break, as much as a third of the students don’t return and their midterm exam grades, therefore, suffer.

#### *Article Summaries*

Each student must write a 2-3 page typewritten summary of two of the articles (s)he will use in her/his term paper. The idea behind this assignment is to get you to start thinking about your term paper and gather and read material early so that you are not just getting started to think and work on your term paper as the end of the quarter draws nearer. In addition to the science that is discussed in each article, you should pay attention to how scientific papers are written and organized. To this end, late summaries will be penalized 1 point for every day they are late. The first summary is due on Feb 4 and the second summary is due Feb 18.

#### *Term Paper:*

Topics: **Alzheimer’s Disease, Diabetes Mellitus, Stroke, Osteoporosis,**

### Hormone Replacement Therapy, or Centenarians

Write a 10-page, double-spaced, scientific review paper of the topic based on a search of the biological and medical literature. Use MEDLINE (PubMed) to do your search; the references listed in this database are all biological or medical. Do not use popular and unreviewed sources, such as *Time*, *Newsweek*, or *Prevention* magazines or newspapers, or potentially any other periodical that can be found on bookstore newsstands. **These are unacceptable!** You may use the internet, but the literature sources *must* be from professional, peer-reviewed journals (the journal, *The Neurobiology of Aging* is probably one of the premier journals in the field of the biological aspects of aging, but other journals that focus on non-neurally related fields are just as good). The internet encyclopedia, **Wikipedia, is unacceptable**, as this is not reviewed. If you have not done this kind of search before, ask the librarians to show you how or ask me. The paper must be typed and double-spaced. Use a word-processor because you will be handing in the paper for review and you are expected to revise the paper before handing in the final version.

Reference Format: A list of the sources you cite in your paper, in alphabetical order by author surname, should appear at the end of your text. Use the format adopted by the Council of Biological Editors as indicated in the following examples.

#### ARTICLE IN A JOURNAL:

All Authors (surname first followed by initials). 2000. Title of the article in full. Journal Name volume # :starting page-ending page.

For example:

Klau M, Hartmann M, Erdmann KS Heumann R, Lessmann V. 2001. Reduced number of functional glutamatergic synapses in hippocampal neurons overexpressing full-length TrkB receptors. Journal of Neuroscience Research 66:327-336.

#### BOOK:

Jones JJ. 2001. Book Title volume (if any). City of publication:Publisher

#### CHAPTER IN A BOOK:

Smith ME, 2002. "Title of Chapter" in: Jones JT (ed.), Book Title. City of Publication:Publishers, pp. Starting page-ending page.

#### SOURCE ON THE INTERNET:

Pritzker, TJ (No date). Title of internet text [Online]. Available: <http://www.list> complete internet address [date you accessed the site]. Please note: not all internet sites are acceptable sources; some are popular, not scientific sites. Before using an internet site as a source, show it to me for approval.

All references should be cited in the appropriate section of the text by author surname and year of publication, as in the following examples:

"Doe and Smith (1992) found that ..." (Your reference list should include an entry for Doe and Smith using the appropriate format above)

OR

“One study on changes in the immune system (Doe and Smith, 1992)...”

If the reference has one or two authors, use the one or both names followed by the year for citations in the text, such as:

“Garcia (2003) found that...”

OR “Garcia and Popoli (2001) found that...”

Similarly, “...blah, blah, blah (Garcia, 2003)”

OR “... blah, blah, blah (Garcia and Popoli, 2001).”

If the reference has more than two authors, use the first author only, followed by *et al.*, such as:

“...blah, blah, blah (Klau *et al.*, 2001).”

If you use an author’s surname in the text, you must have a reference by that person in the reference list or else points will be deducted from your score. In other words, make sure that every citation in the text of the paper appears in the bibliography at the end of the paper and *vice versa*.

Do not use footnotes in the text! And do not cite references by using numbers in the text!

If you want to quote a person *verbatim*, indent and single-space the quoted material and list the author(s), name(s) and the year at the end of the quote. It is better not to quote, but to summarize in your own words. Do not fall into the trap of making your paper simply a series of quotations!

You must have at least 10 references from biological and medical journals. Bring a list of references to class on Feb 4 for my approval (If you don't, you'll lose 20 points). The references should be to articles published within the past 10 years. Do not base your term paper on only books. And, as I indicated above, do not use the popular press.

#### **Content:**

**If you are writing your term paper on Alzheimer’s Disease, Diabetes Mellitus, Stroke, or Osteoporosis, make sure your paper covers the following topics:**

**What percent of people in each age group are estimated to develop the disease? What criteria are used to diagnose the condition? Is the disease progressive with age and how fast do the changes occur? What are the gross biological changes that occur? What are the molecular and cellular changes that occur? What are the risk factors for the disease? What are the treatments and how effective are they?**

**If you are writing your paper on Hormone Replacement Therapy (HRT), make sure your paper covers the following topics:**

**What percent of people in each age group are estimated to use HRT? What criteria are used to determine if HRT is appropriate for that person? What are the risk factors for using HRT? What are the biological changes that cause the need for HRT? How fast do these changes occur? What does HRT do to the body besides just replacing the hormone? -**

**That is, what are the biological changes that occur upon HRT? Which molecules, organelles, cells, or tissues are changing? How effective is HRT?**

**If you are writing your paper on Centenarians, make sure your paper covers the following topics:**

**How are the genetics of Centenarians different from those of others? What physiological traits do Centenarians have that are different from those of others? What do Centenarians do in their lives that may account for their longevity? Given their genetics, does it matter what Centenarians do in their lifestyles that may influence their longevity?**

Write the paper in a scientific style. Each paragraph should have a topic sentence and all paragraphs should have more than one sentence. Use the articles you are reading for your article summaries as models. Be concise. Do not use personal experiences or life histories and accounts in this paper. And do not write in the first person.

Grammar, spelling, typing, and use of the correct format will be considered in assigning points. If you are not clear about the format or whether an article is acceptable, ask me before turning in the paper.

Draft of term paper (*hard copy*) is due – *if you wish* – on Feb 25. That is, if you would like me to evaluate your term paper, critique it, and provide suggestions for improvement before turning it in for a final grade, you may hand in a draft of it to me on Feb 18. If you don't feel it necessary, or for some reason, cannot, you may opt not to as well. It's up to you. This draft will not be graded. But, it might be a good idea to take advantage of this opportunity of potentially improving your chances of getting a better grade on the term paper, and therefore, in the course.

**I will grade the term paper based on the criteria listed in the CSULA Rubric 3 (see accompanying handout). In other words, I will assign your paper a numerical score.**

Revised papers should be turned in on March 11. They should be accompanied by a copy of the first version of the paper (if you opted for me to critique it) with the suggested revisions on it. All the material will be returned to you after it has been graded. Please turn in your papers directly to me in class. Do not leave them in the departmental office or in envelopes under doors. If your paper is lost because you gave it to someone other than myself, you will get zero credit for the assignment.

### **American Disabilities Act**

Reasonable accommodation will be provided to any student who is registered with the Office of Students with Disabilities and requests needed accommodation.

**Student Learning Outcomes:** The following Student Learning Outcomes were instituted by the Dept. of Biological Sciences for students majoring in Biological Sciences. However, for non-Biological Sciences majors, many of the following also apply, depending on his/her own major field of study. SLO #1 would most apply to students enrolling in Biol Sci 384N.

DEPARTMENT OF BIOLOGICAL SCIENCES  
UNDERGRADUATE STUDENT LEARNING OUTCOMES

M/S/P by Assessment Committee: February 11, 2008

1. The student will acquire the following attitudes:
  - 1.1. Learning about both living micro and macro systems is relevant and essential for understanding life.
  - 1.2. All areas of science are integrated and interconnected.
  - 1.3. Scientific ethical conduct and ethical implications of scientific issues in society are important.
2. The student will be able to demonstrate that he/she is skilled at:
  - 2.1. Applying the processes and methods of scientific inquiry, including the search and retrieval of scientific information, the formulation of scientific hypotheses, the design and conduct of experiments, and the analysis and interpretation of data;
  - 2.2. Understanding and critically evaluating the scientific work of others;
  - 2.3. Communicating scientific information effectively using oral presentations and written reports;
  - 2.4. Performing laboratory techniques that are appropriate to the major, with an understanding of the principles of laboratory safety;
  - 2.5. Working collaboratively on group projects.
3. The biology student will be able to demonstrate knowledge of the following:
  - 3.1. Molecular and cellular structure and function;
  - 3.2. Basic principles of anatomy, physiology, and development;
  - 3.3. Taxonomy and phylogenetic and evolutionary relationships of major groups of organisms;
  - 3.4. Ecological interactions among organisms and their relationships with their environments;
  - 3.5. Careers and professions available in the biological sciences.
4. The microbiology student will be able to demonstrate knowledge of the following:
  - 4.1. Microbiological techniques and handling of biohazardous materials;
  - 4.2. Microbial diversity, evolution of microorganisms and transmissible agents;
  - 4.3. Microbial physiology and genetics including cellular structure and function;
  - 4.4. Interactions of microorganisms with multicellular organisms and the environment;
  - 4.5. Applications of microbiology and career opportunities in the field.

### Attitude

Your class attendance is *very* important, as it is well known that there is a good relationship between good attendance and the final grade. **Besides, you get credit for full attendance!** However, the rule is simple: if you attend lecture, you get credit; if you don't attend lecture, you get no credit. The reason is for missing class is not important, because then there is the issue of what constitutes a valid excuse and then it becomes a judgment call. Occasionally, there are times when you might be forced to miss a class. If this is the case, it is your responsibility to get from a classmate *all* the information you missed. Please do not contact me and ask what you may have missed – this is tantamount to having me repeat the lecture, *etc.* all over again. I strongly urge you to make some friends in the class and obtain from them any class material you might have been forced to miss.

Your responsibility is to the lectures. Please ensure that if you have with you a cellular phone, pager, or some other fancy electronic communication device, that it does not sound off. I find it very disruptive to the class and to me. I like to start on time and I find it distracting and disruptive for people to arrive late and just as annoying for people to wander in and out of class at any time. It is unfair and distracting to the other students in the class and to everyone's train of thought. Students are asked to refrain from making inappropriate or offensive comments, sleeping, talking/whispering/giggling with peers, or passing notes. You are all adults and are no longer in high school. A mature attitude is, therefore, expected of you.

If you have to miss an exam or turn in your term paper late (by more than 1 week), I will require official documentation for the reason if you want a make-up exam or need more time for an assignment. Around exam time, there are usually an inordinate number of deaths in students' families, illnesses, emergencies that require traveling, *etc.* If this happens, I will need a copy of the funeral announcement, death certificate, physician's note, plane ticket, *etc.* Also, emergencies of this nature could lead to "RD" (report delayed) or an "I" (Incomplete) at the end of the quarter. However, parties, weddings, friends' weddings, *etc.* or other more frivolous events will not excuse you; if you choose to forgo an exam or assignment in favour of such frivolous pursuits, then you'll just have to live with the grade that you earn.

### Academic Honesty

Students are expected to abide by the University's Academic Honesty Policy, which can be found at [http://www.calstatela.edu/univ/stuaffrs/Academic\\_Honesty.htm](http://www.calstatela.edu/univ/stuaffrs/Academic_Honesty.htm).

Students who violate this policy will be subject to disciplinary action, and may receive a failing grade in the course for a single violation.

### **CSU Employee Furloughs – Impact on Classes**

This year across this campus and around the CSU system some class days will be cancelled because of furloughs. A furlough is mandatory un-paid time off; faculty and staff on each CSU campus are being "furloughed" two days per month. For this course (Biol Sci 384N), there are no furloughs per se as this class meets only on Thursdays and Furloughs occur on Fridays.

**Specifically, Jan 15, Jan 29, Feb 12, Feb 19, Mar 5, and Mar 12.** Therefore, I will technically not be answering any e-mails nor any other questions every other Friday per month. It is important to recognize that these days off are **not** holidays. Instead, they are concrete examples of how massive state budget cuts have consequences for you as students and for me as a faculty member.

The CSU has suffered chronic under funding for at least 10 years. This year the budget cuts are the worst in the history of our university system — \$584 million or 20% of our budget.

The CSU administration is attempting to deal with these cuts with huge increases in student fees (32%), course reductions, and lay-offs of faculty and other university employees.

In addition to paying higher fees, students will likely be affected by reduced services and classes. The library will have shorter hours. Many campus support services may be decreased or eliminated. There may be challenges in getting needed signature on forms. Many courses will be cut from the class schedule or will be full.

If you would like to take action, or simply learn more, I strongly recommend you contact the California Faculty Association on campus to get connected with other CSULA students who are working on these issues.

For more information, please contact CFA by email: [cfa@cslanet.calstatela.edu](mailto:cfa@cslanet.calstatela.edu) or by phone: 323 343 – 5310.