

**University of Southern California**  
**Department of Biological Sciences; Human & Evolutionary Biology**  
**Metabolic Diseases (4.0 units; HBIO 409)**  
**Spring 2016**

**Instructor:** Dr. Scott E. Kanoski (Ph.D.)  
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**Teaching Assistant:** Ted Hsu  
**Office Hours:** Monday 3:00-4:00 P.M. (SHS 166)  
**Email:** [tedhsu@usc.edu](mailto:tedhsu@usc.edu)  
**Phone:** 213-740-4160, or 213-740-6115

**Lecture:** Tues, Thurs (2:00-3:20 P.M.)

**Location:** Lecture: WPH 106, Lab: SHS 165 and/or RRI B17

**Course Description / Objectives:**

This course will focus on metabolic disorders (particular emphasis on obesity) and will provide hands-on research experience in a laboratory that utilizes animal (rodent) models of metabolic disorders. Students will learn about the basic physiology of feeding behavior, the multifactorial causes and consequences of obesity and other metabolic disorders, and will gain firsthand insight into the scientific process from beginning to end by helping to conduct experiments in a laboratory.

**I. Texts / Readings:**

1) Journal readings (PDFs provided on Blackboard by the instructor)

2) Appetite and Food Intake: Behavioral and Physiological Considerations (required). Harris, R.B.S., Mattes, R.D. CRC press, Taylor & Francis Group (2008). Available as print copy.

**II. Grading Outline:**

20%	Participation
20%	Midterm
25%	Final Paper
25%	Final
10%	Lab

▪ Raw scores will be translated into percentages at the end of the semester. The grading scale will be based on a traditional grading scale as follows:

93-100	A
90-92	A-
87-89	B+
83-86	B
80-82	B-
77-79	C+
73-76	C
70-72	C-
67-69	D+
63-66	D
60-62	D-
0-59	F

### **III. Grading Outline Breakdown**

#### **Participation Component**

Students are expected to read the assigned readings prior to class and to attend each lecture. The participation portion of your grade is substantial (20% of total grade) and is based on a combination of: 1) performance on brief quizzes held at the beginning of some classes (70% of participation component). 2) your contributions to class discussions and exercises (30% of participation component).

#### **Midterm**

The midterm exam (20% of course grade) will cover material from the readings and from class discussion. The format of the midterm is short answer and multiple choice. A request to take a make-up exam must be accompanied by evidence of a university-sanctioned excused absence (letter from a doctor, athletic release) and must be made before the date of the scheduled exam. Make-up exams will be different from the scheduled exam (e.g., essay) and may be proctored by personnel who do not have extensive knowledge in the area being tested.

#### **Final Paper Component**

The final paper project will be in the form of a scientific manuscript (Abstract, Introduction, Methods, Results, Discussion, References) that will describe an experiment that we will be conducting over the course of the semester. The first portion will be scored for 10% of the total course grade, and will include an Introduction and Methods section. The second portion will be scored for 15% of the total course grade (25% total for paper), and will include an Abstract, Results, and Discussion section, as well as modifications to the Introduction and Methods based on Instructor feedback.

#### **Laboratory Component**

**Lab Director and Instructor:** Dr. Scott E. Kanoski

**Other Laboratory Contacts:** Ted Hsu ([tedhsu@usc.edu](mailto:tedhsu@usc.edu)); Vaibhav Konanur, M.S. ([vkonanur@gmail.com](mailto:vkonanur@gmail.com)); Dr. Emi Embler ([eembler@usc.edu](mailto:eembler@usc.edu))

Students will be required to participate in an experiment relevant to the course topic outside of class time. The experiment will utilize a rodent model and will require the students to first complete the required laboratory safety training through USC Environmental Health & Safety, and the animal training through the USC Department of Animal Resources.

The participation days and times for the laboratory component will be different for each student, depending on the students' course schedule and the ongoing demands of the experiment. Students will not be required to participate in the laboratory component during times that conflict with their course schedule. The laboratory component grade will be based primarily on reliability of showing up at prescheduled days and times to participate in the experiment. Note: Each time you fail to show up in lab at the prescheduled times, your overall lab grade drops by 33%. *Lab schedules will vary depending on the stages of the experiment and the individual course schedules of the students; however, students should expect to contribute ~60-90min/week outside of class time.*

#### **Final Exam**

The final exam (25% of course grade) will cover material from the readings and from class discussion. The format of the final exam will be announced at a later date. A request to take a make-up exam must be accompanied by evidence of a university-sanctioned excused absence (letter from a doctor, athletic release) and must be made before the date of the scheduled exam. Make-up exams will be different from the scheduled exam (e.g., essay) and may be proctored by personnel who do not have extensive knowledge in the area being tested.

#### IV. Lecture Schedule and Readings:

<b>Date</b>	<b>Lecture Topic</b>	<b>Readings</b>
Jan 12	Introductions and Overview of Class	None
Jan 14	Obesity: Definitions & Epidemiology; Research Overview	Del Parigi
Jan 19	DAR Animal Research Training	Animal Research Documentation
Jan 21	Lab Safety Training ( <i>Fri 23<sup>rd</sup>, 2-5PM GFS 116</i> )	None
Jan 26	Obesity Pathophysiology; Research Overview	Francis; Gunstad; Must & McKeown
Jan 28	Energy Expenditure, Exercise, and Obesity; Kanoski SHS Lab tour	Brownson; Donnelly; Harris & Mattes Ch 1
Feb 2	Feeding Behavior Overview; Class Experiment Overview	Harris & Mattes Ch 2 & Ch 6; Hsu
Feb 4	Dietary Determinants of Obesity I (sugars and artificial sweeteners); Kanoski RRI Lab tour	Bray; Swithers; Ventura
Feb 9	Dietary Determinants of Obesity II (macronutrients)	Harris & Mattes Ch 16; Rolls
Feb 11	Genetic Determinants of Metabolic Disease	Prentice
Feb 16	Appetite / Hunger (ghrelin)	Harris & Mattes Ch 3
Feb 18	Taste & Orosensory Processing	Harris & Mattes Ch 7 (skip section 7.2.3); Sartor
Feb 23	Class Experiment Protocols Review; Review for Midterm I	None
Feb 25	<b>MIDTERM I</b>	None
March 1		
March 3	Neural Controls Overview – Review Midterm – Schedule Experiment	Ye; Tokunaga
March 8	Endocrine Controls I (CCK and Leptin) & Scientific Writing I	Harris & Mattes Ch 12 (sections 12.1-12.6)
March 10	Endocrine Controls II (GLP-1) & Scientific Writing II	Harris & Mattes Ch 10
March 15	<b>No Class - Spring Recess</b>	
March 17	<b>No Class - Spring Recess</b>	
March 22	Neural Controls II and Satiation	Powley; Azzara
March 24	Obesity Documentaries	Kringelbach
March 29	Obesity and Addiction: Commonalities	Stice; Lenoir; Harris & Mattes Ch 5
March 31	<b>Final Paper Part I Due: Overview of Paper Part II</b>	None
April 5	Microbiome	TBA
April 7	Behavioral Obesity Treatment	Tate & Wing
April 12	Obesity Treatment: Pharmacological	Ravussin; Astrup
April 14	Class experiment results and Paper II	Batchelder
April 19	Obesity Treatment: Surgical & Policy and Prevention I	Andreyeva / Bleich
April 21	Obesity Treatment: Policy and Prevention II ( <b>Final Paper Part II Due</b> )	None
April 26	Type II Diabetes	Tran
April 28	Review Session for Final exam (paper II returned)	None
April 30 – May 3	Study Days	
TBA	<b>FINAL EXAMINATION - 2:00-4:00 P.M., WPH 106</b>	

#### **IV. Academic Conduct**

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Section 11, *Behavior Violating University Standards* <https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions/>. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct/>.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the *Office of Equity and Diversity* <http://equity.usc.edu/> or to the *Department of Public Safety* <http://capsnet.usc.edu/department/department-public-safety/online-forms/contact-us>. This is important for the safety whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. *The Center for Women and Men* <http://www.usc.edu/student-affairs/cwm/> provides 24/7 confidential support, and the sexual assault resource center webpage [sarc@usc.edu](mailto:sarc@usc.edu) describes reporting options and other resources.

#### **V. Support Systems**

A number of USC’s schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the *American Language Institute* <http://dornsife.usc.edu/ali>, which sponsors courses and workshops specifically for international graduate students. *The Office of Disability Services and Programs* [http://sait.usc.edu/academicsupport/centerprograms/dsp/home\\_index.html](http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html) provides certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, *USC Emergency Information* <http://emergency.usc.edu/> will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.

#### **VI. Blackboard**

Notes and reading assignments will be periodically posted on blackboard. However, the information posted on blackboard is not the only material that will be on the exam. If you attend class regularly you will be updated on the status of lecture notes and course material/announcements.

#### **VII. Electronic Devices**

Please turn off or disable all cell phones or other electronic communication devices during class time. Using a laptop in class to take lecture notes is permitted. However, please turn off your browser, email, messaging and any other programs that do not involve the course material.