Tufts University, Friedman School of Nutrition Science and Policy

NUTB 242 OBESITY AND ENERGY REGULATION
MSNP | Tufts University, Friedman School of Nutrition Science and Policy (Spring 2016)

Instructors:

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Office hours online (Skype voice or by Skype IM) by appointment

Credit: 0.5

Required Text
Obesity, Causes, Mechanisms, Prevention and Treatment
Edited by Elliott M. Blass
Sinauer Associates Inc. Sunderland, MA 01375

Description and Goals

Obesity is an epidemic in some countries and is a global public health issue. Students in this course will have the opportunity to understand the basics of energy regulation in obesity as it relates to factors controlling food intake. Coverage includes the role of energy density of foods, eating behavior, sensory and hedonic inputs, metabolic influences on the controls of meal size, environmental and energy expenditure influences on energy balance and body weight and current perspectives and controversies concerning exercise as well as possible strategies for obesity prevention and treatment. Childhood obesity and specifics that pertain to children will be briefly discussed. The course will integrate examples of community, clinical and public health policy applications. Published journal articles from the peer reviewed literature that are topical and current, “real-time online lectures or meeting proceedings” and media reports will be included as part of the critical review and discussions each week. This course will be offered in the latter half of the spring semester.

Course Objectives/Outcomes
By the end of this course, students will:

- Be able to identify the key players in energy regulation and body weight in the general population.
- Describe hedonic and homeostatic central and peripheral mechanisms relevant to obesity
- Discuss some of the strengths and limitations of the scientific evidence relating to diet and exercise as it relates to energy regulation
- Be able to integrate behavioral and biological findings relating to energy regulation and body weight
• Critically assess the latest efforts in obesity management by nutritional science, obesity therapeutics by the pharmaceutical industry and public policy.
• Have the knowledge to comprehend and dissect the components of research articles and critique peer reviewed published journal articles.
• Gain the skills required to translate and communicate this body of knowledge to the public.
• Identify areas of potential collaboration between biologists, nutritionists and social scientists in successfully addressing the obesity epidemic nationally and worldwide;

Assignments, Exams and Grade Evaluation

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Weight</th>
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<tbody>
<tr>
<td>One take-home final paper</td>
<td>25%</td>
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<tr>
<td>Mini Assignments for Weeks 3,4,5 and 6 (see grading matrix on page 3)</td>
<td>40%</td>
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<tr>
<td>Residency attendance and all class preparedness</td>
<td>10%</td>
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<tr>
<td>Residency group presentation</td>
<td>25%</td>
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The following guidelines are used in evaluating course performance:

1. Mini assignments will be evaluated on the basis of completeness, originality, scientific soundness and relevance to the assigned topic, as well as adherence to due dates.

2. All written work including mini assignments will be evaluated on the quality of thought, completeness, adherence to guidelines, scientific integrity, and ability to incorporate and communicate ideas and information effectively.

3. Adherence to instructions and guidelines of the assignments is critical.

4. Attendance at all class sessions. Please see the Attendance Policy. Missed time will affect your grade unless prior arrangements were requested and approved in writing by the instructors for make-up work.

5. Student presentation guidelines will be provided via email after the course is opened.

A grade of A is excellent, and is defined as far and above the stated requirements for the given assignment. B is defined such that the student met the basic requirements. C is less than adequate. Grades less than C are considered a failure. You must have a grade average of 3.0 (B) to receive a degree from the Friedman School. Grades will be posted throughout the semester in the course Gradebook in Trunk, our Learning Management System.

Attendance Policy

Upon joining this Master of Nutrition Science and Policy degree program, you become a member of a cohort, a learning group. Hopefully you will find the group experience provides you with a tremendous support system, a rich learning environment, and a long lasting network of colleagues to learn with and from. As a member of a cohort in an intensive experiential learning community, your consistent and complete participation is an essential and necessary component to the group’s success. Absences jeopardize the academic integrity of the program as well as the quality of your and your colleague’s learning experiences.
Therefore, please arrange to be present at all residency sessions during this third term. If you miss any

time, documentation in writing is required in advance. Every hour of missed residency time may lower

your final grade by 2%.

Time extensions, make-up work, and a grade of Incomplete will only be given under the most extreme

circumstances. Requests for these items must be made in advance, in writing, to the Dean for Academic

Affairs and must have prior approval, in writing, of the academic adviser and the instructor.

**Communication Policy**
Students should seek out information themselves, and from the class site. If you do not find your answer

contact the instructor and TA as soon as possible. Please do not wait. Faculty/TA will answer within 48

hours. It is your responsibility to contact the instructor immediately if you have, suspect or anticipate any

issues or questions regarding course content, assignments and due dates. If you have, suspect or anticipate

technical difficulties, it is your responsibility to contact technical support immediately. Communication

and anticipation of issues is vital due to the distance nature of this course.

**Technical Support**
All technical support questions should be directed to trunk@tufts.edu (https://sites.tufts.edu/trunksupport/) or asked via Skype. Students should contact technical support for technical issues. Monday through Friday 9 am - 5pm (Eastern Time). Faculty should not be contacted for technical support.

**Exams in Trunk**
If you have an exam you should anticipate problems and it is strongly recommended that you take the

exam during hours where there is technical support available Monday through Friday 9 am - 5pm Boston

time (Eastern Time). If your computer goes down or Trunk goes down for some reason during your exam,

the timer will continue to run in Trunk. Go back into Trunk and back into the exam. The time will have

continued to count down, but it will have saved your answers to the point you lost access. If you continue

to have difficulty, shut down your computer and go back in again. If still you have difficulty, contact

technical support Monday through Friday 9 am - 5pm (Eastern Time).

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**CLASS SCHEDULE**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Week</th>
<th>Topic</th>
<th>Instructor</th>
<th>Assignment</th>
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</thead>
<tbody>
<tr>
<td>Jan 24 – Jan 31</td>
<td>Before Week 1</td>
<td>Online Lecture</td>
<td>Epidemiology of Obesity</td>
<td>Das</td>
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<td></td>
<td>Course Begins</td>
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<tr>
<td>Feb 1 – Feb 7</td>
<td>Residency Week 1</td>
<td>Energetics of Overeating and Obesity</td>
<td>Das</td>
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<td>Feb 8 – 14</td>
<td>Residency Week 2</td>
<td>Factors Controlling Food Intake-Dietary, Sensory and Hedonic</td>
<td>Das/Roberts</td>
<td>In Class Presentation</td>
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<td></td>
<td>Week 3</td>
<td>Metabolic Control of Energy Intake–Central and Peripheral</td>
<td>Felsted</td>
<td>Assignment 1</td>
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Course Prerequisites:
A course in general nutrition and another in nutritional biochemistry (macronutrients) is required.

Course Requirements:
1. Attend all residency sessions (arrive on time and remain for the entire scheduled session).
2. Contribute with positive participation and involvement in all in-class and on-line activities.
3. Complete all in-class and group assignments.
4. Contribute constructively to all on-line discussions.
5. Complete all exams

Readings, Activities & Discussions
For specific information and directions on how to do the assignments and what is due, please go to "Resources" in your Trunk course site.

Academic Conduct:
You are expected to complete all assignments independently, that is, without the assistance of another human (including fellow students, faculty, anonymous online folk, etc.), unless otherwise noted. (Discussions, obviously, are one such exemption.) All documents used in preparing your work must be properly referenced (see “Formatting Assignments” above). Please refer to the Tufts University Academic Integrity Policy at http://uss.tufts.edu/studentaffairs/handbook/campus/academicintegrity.asp and to the Friedman School’s Policies and Procedures manual (http://nutrition.tufts.edu/student/documents). Instructors and other university personnel may request that students submit written assignments to plagiarism prevention resources, websites, or other authoritative databanks, such as (but not limited to) “turnitin.com,” or a similar site. These services compare student-produced documents with web content, newspapers, journals, magazines, books, student essays, and other data to determine the originality of student work.
Course Topics by Week, Learning Objectives, and Readings

Pre-Week 1 The Epidemiology of Obesity

Student Learning Objectives: Students will review this lecture on their own. This overview is designed to help students gain an understanding of the current epidemic, the role of sociological and psychological factors contributing to obesity in diverse populations and the health effects of excess weight including the health cost burden of obesity treatment. Students will explore the issues relating to public policy about the biological, behavioral, and sociological correlates of the obesity epidemic and efforts undertaken to understand and control the obesity epidemic through national and international public policy.

Lecture:

1) The Global Obesity Epidemic - Why? Presentation by Dr. Bray at the Nestle Nutrition Institute

Required readings: (Please refer to the TRUNK course site for all links)

1) The Epidemiology of Obesity–Causal Roots and Roots of Cause. Blass, Chapter 2 pages 19-72

Supplementary readings and links: Please refer to the TRUNK course site for current posts


Week 1 Energetics of Overeating and Obesity

Student Learning Objectives: This class will provide a deeper understanding of the role of macronutrients in the development of obesity. The metabolic consequences of excess energy intake and weight gain will be examined. Energy metabolism in the obese will be examined from the perspective of the components of total energy expenditure and how each compartment is handled in obesity.

Required readings: (Please refer to the TRUNK course site for all links)


Supplementary readings and links:

2) Effect of diet composition and weight loss on resting energy expenditure in the POUNDS LOST study. de Jonge L. Bray GA. Smith SR. Ryan DH. de Souza RJ. Loria CM. Champagne CM. Williamson DA. Sacks FM.

**Student Presentations** in Class during the Residency period.

Topics: The role of macronutrients—carbohydrates, fat and protein in weight regulation and development of obesity.

Specific instructions will be sent out via email.

**Week 2 Factors Controlling Food Intake - Dietary, Sensory and Hedonic**

**Student Learning Objectives:** This class will provide an in-depth review of the various dietary factors implicated in the control of food intake. By integrating behavioral and biological findings from humans and animal models of obesity the relationship between eating, energy balance and weight will be examined. Sensory and hedonic inputs will be introduced to provide the background for the subsequent class where the gut brain components are linked.

**Required readings:** (Please refer to the TRUNK course site for all links)

1) Blass, Chapter 3 pages 73-76, Chapter 7 pages 211-35

**Supplementary readings and links:** (Please refer to the TRUNK course site)


**Week 3 Metabolic Control of Energy Intake – Central and Peripheral Controls**

**Student Learning Objectives:** With this class students will appreciate the link between meals as units of energy intake, the control of meal termination and the mediation of metabolic signals associated with food ingestion. Hedonic and homeostatic central mechanisms relevant to obesity and the cross talk between central and peripheral signals will be reinforced. Short and long-term controls of food intake will be examined with an intent to provide a complete understanding of the gut brain signaling and how these signals influence energy intake.

**Required readings (Please refer to the TRUNK course site for all links):**


Supplementary readings and links: (Please refer to the TRUNK course site)

**Assignment 1:** Based on an article that is current from the “obesity and energetics offerings website” and is on a topic related to “central or peripheral control of food intake”—students will be asked to provide a brief critical review and emphasize the strengths and limitations of the journal article’s study design and interpretation.

**Week 4 Childhood Obesity**

**Student Learning Objectives:** Overweight and Obesity among children and adolescents will be reviewed by examining the potential contributing factors and pathways to excess consumption. The impact of energy intake and energy expenditure in relation to childhood weight will be discussed in greater detail. The influence of media and marketing will be briefly alluded to in the context of intervention efforts that are being implemented.

**Required readings:** (Please refer to the TRUNK course site for all links)

1) Children's reward responses to picture- and odor-cued food stimuli: a developmental analysis between 6 and 11 years.

Supplementary readings and links: Please refer to the TRUNK course site

**Assignment 2:** Based on your understanding of the role of various potential players in childhood obesity, summarize your response using no more than 500 words on what you think are the important energetic factors that influence excessive intake and childhood weight gain. Support your views using critical thinking and professional judgment.

**Week 5 Exercise and Environmental Regulators of Energy Metabolism**

**Student Learning Objectives:** This class will cover discussions on energy expenditure and weight regulation. The role of physical activity and exercise in weight gain, weight loss and obesity prevention and as well as the health benefits of exercise will be examined using population trends, active interventions and health related metrics.
Required readings: (Please refer to the TRUNK course site for all links)

1) Blass, Chapter 8 pages 249-74
2) Time use and physical activity: a shift away from movement across the globe. Ng SW. Popkin BM. Obesity Reviews. 13(8):659-80, 2012 Aug
3) Physical activity for obese individuals: a systemic review of effects on chronic disease risk factors. Katzmarzyk PT. Lear SA.

Supplementary readings and links: (Please refer to the TRUNK course site)

Assignment 3: Perform a literature search for interventions in adults where exercise was used as an obesity prevention or weight control intervention (include studies where one of the arms was an exercise intervention). Limit your search to the period 2012- current. Using a table format summarize the author name and year, duration of study, key design features and results including adherence. Include a comment that discusses an issue that is central to the study’s success or failure.

Week 6 Framework for Obesity Treatment

Student Learning Objectives: Obesity prevention efforts that are currently underway as well treatment options/modalities will be reviewed. Students will be able to critically assess the latest efforts in obesity management by nutritional science, obesity therapeutics by the pharmaceutical industry and public policy. The discussions will integrate the information from human and animal studies in obesity research and therapeutics;

Required readings: (Please refer to the TRUNK course site)


Supplementary readings and links: (Please refer to the TRUNK course site)


Assignment 4: If you were in an obesity and weight management clinic and were approached by a patient who is interested in weight control, how would you manage the expectations of your patient. Using a flow chart walk the patient through the various options he/she may have available to managing their weight.