

Tufts University, Friedman School of Nutrition Science and Policy

**NUTB 204 – Epidemiology for Nutrition Professionals
Spring 2024**

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Office Hours: By appointment

Graduate Credits: 3 units

Prerequisites: One semester of statistics

Course Description:

This course covers basic epidemiologic concepts and methods and introduces students to techniques, including dietary assessment methods, that are used in human nutrition research. Topics covered in this course include study design and implementation in nutrition research, calculation and interpretation of basic measures of disease frequency and measures of association, sources of error in research studies, causal inference, and an introduction to the evaluation and interpretation of epidemiological data. Students will discuss past and recent publications and apply their understanding of abstract concepts and specific quantitative methods to the interpretation and critique of published work.

Course Objectives:

By the end of this course, students will be able to:

- Describe the principles of epidemiology and its major objectives and explain the scope of epidemiology as a discipline.
- Explain basic methods of dietary assessment.
- Discuss the importance and challenges of conducting epidemiologic investigation of chronic diseases.
- Calculate, interpret and compare measures of disease frequency and measures of association.
- Differentiate among various epidemiologic study designs used in nutrition research, identify steps to conduct each study design, explain their strengths and limitations, and identify research questions that would be appropriately addressed by each study design.

- Explain the effects of random error and learn strategies to reduce it.
- Discuss the concept of bias, explain its consequences, and outline strategies to prevent or reduce its occurrence.
- Discuss the concepts of confounding and effect modification, explain their consequences, and explain how to prevent and control for confounding and how to interpret effect modification.
- Describe the potential role of genetic factors in modifying associations between environmental factors, such as diet, and disease.
- Explain causal inference in epidemiologic studies and use a specific set of criteria to assess whether an association is causal.
- Discuss the principles of screening and evaluate screening in terms of sensitivity and specificity.
- Critically evaluate published nutrition research.

Texts:

Required Textbook:

Calentano DD and Szklo M. *Gordis Epidemiology*, 6th Edition. 2019. Publisher: Elsevier Saunders. ISBN: 978-0323552295. (Also available online at the Hirsh Health Sciences Library).

Nutritional Epidemiology: Possibilities and Limitations. 1996. By: Lillian Langseth. Publisher: International Life Sciences Institute, ISBN 0-944398-87-1.

This text is available **free** as an e-text version, at:

<http://ilsi.org/publication/nutritional-epidemiology-possibilities-and-limitations/>

Optional Textbook:

Aschengrau A and Seage GR III. *Essentials of Epidemiology in Public Health*. 4th Edition. 2020. Publisher: Jones & Bartlett Learning. ISBN: 978-1284128352. (Also available online at the Hirsh Health Sciences Library).

Course Canvas Site:

All class materials (recorded lectures, slides, readings, etc.) are available on the class website at <https://canvas.tufts.edu>.

Academic Conduct:

Each student is responsible for upholding the highest standards of academic integrity, as specified in the Friedman School's Policies and Procedures Handbook (<https://nutrition.tufts.edu/sites/default/files/documents-forms/20212022PolProc.pdf>) and Tufts University policies (<http://students.tufts.edu/student-affairs/student-life-policies/academic-integrity-policy>). It is the responsibility of each student to understand and comply with these

standards, as violations will be sanctioned by penalties ranging from failure on an assignment and the course to dismissal from the school.

Classroom Conduct:

Upon joining this Master of Nutrition Science and Policy blended degree program, you become a member of a cohort, a learning group. We trust that this group experience provides you with a tremendous support system, a rich learning environment, and a long-lasting network of colleagues and friends 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. Please contact us if you have any questions.

Assessment and Grading:

The overall grade for the course will be based on the following assessments:

Online Discussion Forums	30% of final grade
3 Problem Sets	10% of final grade
Midterm Exam	15% of final grade
Final Exam	15% of final grade
Final Paper Critique	30% of final grade

A passing grade in the course is B- or better. Course grades will be based on the following (subject to revision during the course):

A+ \geq 97%

A 94 - <97%

A- 90 - <94%

B+ 87 - <90%

B 84 - <87%

B- 80 - <84%

Online Discussion Forums (30% of the final grade).

Each week, the instructors will open a Discussion Forum and you will be required to post within the Discussion Forum by the end of that week. Following the required submissions, you are welcome to continue the discussion! Discussion Forums will be graded on a scale from 0 to 10, with 1 point for timeliness and 9 points for the quality of the posting in response to the questions posed.

Problem Sets (10% of the final grade).

There will be three Problem Sets to be completed during the course. These assignments will include computational exercises (e.g., calculations of measures of disease frequency and association), multiple-choice questions, or short answer questions. These assignments are designed to provide practical application of the concepts presented in readings, lectures, and discussed in our discussion forums. Collaboration with classmates on Problem Sets is strongly encouraged.

Midterm and Final Exams (each worth 15% of the final grade)

There will be a midterm and a final examination. Both are "take-home" style and open book and will include multiple choice and short answer questions. Each student is expected to work independently (no collaboration allowed). You will have a week to complete each exam.

Final Paper Critique (30% of the final grade).

At the end of the semester, students will be asked to hand in a final paper. The paper will involve a critique of an assigned journal article and will be an independent project (no collaboration allowed). The article will be posted on the course website along with guidelines for the critique. A maximum of 7 pages (typed, 12pt font and double spaced) will be allowed.

Extension Requests

Students who are unable to complete an assignment on time for any reason should notify the instructors by email prior to the deadline, with a brief explanation for why the extension is needed.

Assignments and Submission Instructions:

Students will have approximately one week to complete discussion forums, problem sets, and exams. If you have an exam, you should anticipate problems, and it is strongly recommended that you take the exam during hours when there is technical support available, Monday through Friday 9 am - 5pm (Eastern Time).

All are welcome:

We believe that the diversity of student experiences and perspectives is essential to the deepening of knowledge in this course. We consider it part of our responsibility as instructors to address the learning needs of all of the students in this course. We will present materials that are respectful of diversity in race, color, ethnicity, gender, age, disability, religious beliefs, political preference, sexual orientation, gender identity, socioeconomic status, citizenship, language, or national origin, among other personal characteristics. We would like to create a welcoming classroom environment in which all feel comfortable to participate and learn.

Accommodation of Disabilities:

Tufts University is committed to providing equal access and support to all students through the provision of reasonable accommodations so that each student may access their curricula and achieve their personal and academic potential. If you have a disability that requires reasonable accommodations, please contact the Friedman School Assistant Dean of Student Affairs at 617-636-6719 to make arrangements for determination of appropriate accommodations. Please be aware that accommodations cannot be enacted retroactively, making timeliness a critical aspect for their provision.

Course Schedule: *(This schedule is subject to modification at the instructors' discretion)*

Dates	Wk	Instructor	Topic	Assignments Due (*)
Jan 17-21	1	Singh	Approach and Evolution of Epidemiology	<i>Discussion Forum: Opens Jan 17 12:00 am; closes Jan 21 11:59 pm</i>
Jan 22-28	2	Choumenkovitch	Introduction to Nutritional Epidemiology	<i>Discussion Forum: Opens Jan 22 12:00 am; closes Jan 28 11:59 pm</i>
Jan 29 - Feb 4 (RESIDENCY)	3	Choumenkovitch	Assessing Nutritional Status in Epidemiologic Studies / Overview of Study Designs	Problem Set 1: Opens Feb 4 8pm; closes Feb 11 11:59 pm
	4	Singh	Experimental Studies /Epidemiologic Investigation of Chronic Diseases	
Feb 5-11			TRAVEL TIME	
Feb 12-18	5	Singh	Measures of Disease Frequency/Occurrence	<i>Discussion Forum: Opens Feb 12 12:00 am; closes Feb 18 11:59 pm</i>
Feb 19-25	6	Singh	Comparing Disease Frequencies	<i>Discussion Forum: Opens Feb 19 12:00 am; closes Feb 25 11:59 pm</i>
Feb 26 - Mar 3	7	Choumenkovitch	Observational Studies: Cohort Studies and Case-Control Studies	<i>Discussion Forum: Opens Feb 26 12:00 am; closes March 3 11:59 pm</i>
March 4-10	8	Choumenkovitch	Descriptive Epidemiology Random Error	<i>Discussion Forum: Opens March 4 12:00 am; closes March 10 11:59 pm</i>
March 11-17	9	Choumenkovitch	Confounding Energy Adjustment	Problem Set 2: Opens March 11 10:00 am; closes March 17 11:59 pm <i>Discussion Forum: Opens March 11 12:00 am; closes March 17 11:59 pm</i>
March 18-24	10	Choumenkovitch	Bias Interaction	Mid-term Exam: Opens March 21 10:00 am; closes March 28 11:59 pm <i>Discussion Forum: Opens March 18 12:00 am; closes March 24 11:59 pm</i>
Mar 25-31	11	Singh	Genetic and Environmental Factors in Disease Causation	<i>Discussion Forum: Opens March 25 12:00 am; closes March 31 11:59 pm</i>
April 1-7	12	Choumenkovitch	Screening in Epidemiology and Public Health	<i>Discussion Forum: Opens April 1 12:00 am; closes April 7 11:59 pm</i>
April 8-14	13	Singh	Estimating Risk in Analytic Studies: Is There an Association? Causal Inference	Problem Set 3: Opens April 8 10:00 am; closes April 14 11:59 pm <i>Discussion Forum: Opens April 8 12:00 am; closes April 14 11:59 pm</i>
April 15-21			READING PERIOD	
April 22-April 28			FINAL EXAM	Final Exam: Opens April 22 10:00 am; closes April 30 11:59 pm
April 29-May 5			FINAL PAPER	Final Paper Critique due May 8 11:59pm

***Please note: All times refer to Eastern Time (ET)**