

Graduate Group in Epidemiology and Biostatistics
Nutritional Epidemiology
EPID 7012
Spring 2025

1. Course Description

This course introduces students to key concepts and methods in Nutritional Epidemiology to equip them with the tools needed to design, analyze, and critically evaluate population-based nutrition research. The course also reviews several specific diet/disease relationships, integrating information from secular trends, cohort studies, clinical trials, and animal experiments. Knowledge in nutrition is useful but not required. Prerequisites include introductory epidemiology.

2. Course Learning Objectives

After completing this course, students will be able to:

- Describe the strengths and limitations of different epidemiological study designs for research in nutritional epidemiology;
- Discuss in detail the strengths and limitations of different nutritional assessment methods for population health research;
- Describe the current state of epidemiological evidence for relationships of diet to the development of selected diseases;
- Identify sources of bias in nutritional data and ways to address them;
- Critically interpret and critique nutritional epidemiologic literature;
- Formulate study designs to assess the nutritional status of a study population.

3. General Course Information

Co-Directors: Stefanie N. Hinkle, PhD (Stefanie.Hinkle@pennterms.edu)

Sunni L. Mumford, PhD (Sunni.Mumford@pennterms.edu)

TA: Naria Sealy (Naria.Sealy@pennterms.edu)

Location: Blockley Hall Room 418

Credits: 1.0 course unit

Prerequisites: EPID 7010, EPID 5100, PUBH502, or equivalent; permission of course director.

4. Course Format

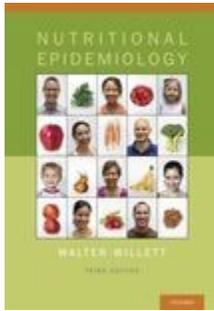
This seminar format class will take place in person once a week for 3 hours for a total of 15 weeks. The class is scheduled on Tuesday 1:45 to 4:45 pm. Students are expected to attend all class sessions and actively participate. Class periods will include lectures, journal clubs, and small group discussions.

5. Course Competencies

The course emphasizes the following core competencies: knowledge within nutritional epidemiology; research skills (study planning, data interpretation, reading and understanding published research); quantitative and computational methodologies (data analysis overview and interpretation of output); communication (writing and presentation skills).

6. Materials

- Willett W. Nutritional epidemiology. Oxford university press; 2012 Nov 7.



Nutritional Epidemiology (3rd edn)

The digital version of the book is available through the library at this link:

<https://doi.org/10.1093/acprof:oso/9780199754038.001.0001>

- Selected required readings are provided in the Files folder on Canvas, in the subfolder for each class session.

7. Scientific Rigor and Reproducibility

Through in-depth reading and evaluation of research literature, course discussions, and assessment work this course will provide instruction on rigorous experimental design and data interpretation.

8. Assessments

- Dietary Assessment Report (10%): Students will self-complete a food frequency questionnaire, a 24-hour dietary recall, and a food diary. Students will complete a 2 to 3-page (double spaced- 0.5-inch margins, 11 pt Arial font) report discussing: 1) pros and cons of each method including the reproducibility and validity; 2) students should identify a primary source published, peer-reviewed journal article (different from those discussed in class) discussing the validation of a food frequency questionnaire in a selected population and provide a discussion of the adequacy of the reference source, generalizability, validity of the findings, etc. Find at least 3 published papers that use an FFQ and/or 24 hour recall and critique the methods of the paper, discuss the implications of using the chosen method, and whether another method would have been more appropriate.
- Presentation on the development and state of the research of an assigned dietary pattern (20%): Students will prepare and present a 9-to-10-minute presentation on the state of the science regarding a selected dietary pattern or food group. Presentations should cover themes related to how to define/assess intake of the selected dietary pattern or food group, current state of evidence related to health outcomes, recommendations if any by advisory organizations. Presentations will take place in person. Topics will be assigned at random by the course director in advance.
- Paper and presentation on a controversial topic in nutrition (30%): Students will prepare a 4-5 page (double spaced- 0.5-inch margins, 11pt Arial font) research paper on a controversial topic in nutrition. Students should discuss multiple primary research articles for each side of the debate and discuss the potential biases within the papers, comparisons of the study samples, dietary assessment methods, generalizability, and biological plausibility of the findings. Students will prepare and present a 9-to-10-minute presentation on their findings. The paper is worth 20% and the presentation is worth 10%. Topic options are provided by professors.
- Journal Club (15%): Students will prepare and lead a journal club discussion on a pre-selected paper by the course instructors.

- Mid-term Exam (25%): The exam will assess the first half of the semester course material. Assessments will include short answer questions on covered topics and data interpretation.

9. Inclusive Environment

In our Nutrition Epidemiology course, we prioritize creating an inclusive and supportive environment that welcomes students of all backgrounds. Diversity, inclusion, and belonging are at the heart of our course values. We believe that every participant, regardless of their race, ethnicity, gender identity, sexuality, religious beliefs, physical or mental health status, or socioeconomic status, deserves to be treated with respect and consideration.

We expect all students to engage in respectful communication, actively listen to diverse perspectives, and refrain from any demeaning, discriminatory, or harassing behavior. Our commitment is to ensure that lectures, office hours, and group sessions are safe and welcoming spaces for everyone. This approach is essential for fostering a learning environment where every student feels valued and can thrive both academically and personally.

10. Office hours

We are available immediately before and after class and are also available by appointment. If you have any questions or problems, it is important to see us as soon as possible so we can appropriately address the situation.

11. Resources

It is important to us that you have the resources you need to be able to focus on learning in this course – this includes both the necessary academic materials as well as taking care of your day-to-day needs. Students who are struggling to afford sufficient food to eat every day and/or lack a safe and suitable space to live should contact Student Intervention Services (vpul-sisteam@pobox.upenn.edu). Students may also wish to contact their Financial Aid Counselor or Academic Advisor about these concerns. You are welcome to notify us if any of these challenges are affecting your success in this course, as long as you are comfortable doing so – we may have resources to support you.

12. Mental health and wellness

Your mental health and wellness are of utmost importance to the course instruction staff, if not the University as a whole. All members of the instruction staff will be happy to chat or just to listen if you need someone to talk to, even if it's not specifically about this course.

Penn also has a Counseling and Psychological Services program which offers free confidential help to students. Here is the link: <http://www.vpul.upenn.edu/caps/> If you or someone you know is in distress and urgently needs to speak with someone, please do not hesitate to contact CAPS: 215-898-7021; 3624 Market St. If you are uncomfortable reaching out to CAPS, any member of the instruction staff will be happy to contact them on your behalf.

13. Artificial intelligence

Within this class, you are welcome to use foundation models (like ChatGPT) for any purpose, at no penalty. However, you should note that all large language models still have a tendency to make up incorrect facts and fake citations. You will be responsible for any inaccurate, biased, offensive, or otherwise unethical content you submit regardless of whether it originally comes from you or a foundation model. If you use a foundation model, its contribution must be acknowledged. The university's policy on plagiarism still applies to any uncited

or improperly cited use of work by other human beings, or submission of work by other human beings as your own.

14. Attendance

Attendance at lectures is highly encouraged. A major part of the work of this course includes the in-person journal clubs. However, if you are feeling at all sick or displaying any COVID-19 related or flu like symptoms, please be considerate of your classmates and stay home. Students who cannot attend in-person lectures can view the recorded lectures afterwards. Slides will be posted before each session. Please make a serious effort to be in person when we have guest lectures.

15. Class Schedule

Week 1	21-Jan-25	Overview of Nutritional Epidemiology Dietary assessments part 1 (Food Records, 24-hour Dietary Recall)
Week 2	28-Jan-25	Dietary assessments part 2 (Food Frequency Questionnaires, Supplements)
Week 3	4-Feb-25	Assessment of Nutrients and Variability in Self-Reported Diet Biomarkers
Week 4	11-Feb-25	Dietary patterns Student presentations on dietary pattern
Week 5	18-Feb-25	Measurement Error
Week 6	25-Feb-25	Total Energy Intake
Week 7	4-Mar-25	Nutritional Monitoring and Surveillance, Dietary Guidelines for Americans Mid-term
Week 8	11-Mar-25	Spring Break
Week 9	18-Mar-25	Anthropometric Measures, Body Composition
Week 10	25-Mar-25	Nutrition and Health Policy
Week 11	1-Apr-25	Food & Nutrition Security
Week 12	8-Apr-25	Beverages & Processed Foods
Week 13	15-Apr-25	International nutrition Other Lifestyle Exposures
Week 14	22-Apr-25	Genomics and Nutrition New Methods in Nutritional Epidemiology
Week 15	29-Apr-25	Student presentations