This one credit course is designed as a forum for second year doctoral students to critically discuss papers from current, peer reviewed journals; identify gaps that need to be filled with future research; and consider appropriate experiment designs and implications of new research. It is hoped that through careful review of published research, students will improve their critical thinking skills and ability to integrate knowledge across the different areas of nutrition. More specifically we hope you will learn to:

1. "Think on your feet", that is, to answer questions about your knowledge or state your opinions clearly to your colleagues in a spontaneous manner.
2. Describe and interpret results presented in graphs and tables.
3. Identify how a paper contributes to our understanding of critical concepts.
4. Assess research designs: is the design appropriate for testing hypotheses set out by the authors?
5. Identify questions left unanswered by a research paper, and think critically about how to fill gaps.
6. Understand translational research in terms of the interrelationship of biochemistry/genetics, epidemiology and intervention/policy around selected nutrition topics (e.g. how findings in one field inform research in another; how scientific evidence is used in development of policy and interventions, etc.).
7. Articulate study aims and key elements of a study design to address a gap in scientific knowledge.

**Topic:** Does breastfeeding reduce the risk of obesity and cardio-metabolic disease? There is extensive literature on the benefits of breastfeeding for short term infant health. However, the benefits for long term health are less well understood. In particular, there is controversy over whether breastfeeding reduces later risk of obesity and diabetes. We will explore the biological basis and potential mechanisms through which breastfeeding and specific bioactive compounds in human milk may affect development of obesity and diabetes, critique the epidemiologic evidence of associations of infant feeding with later disease risk, and evaluate intervention and strategy policies to promote optimal infant feeding. For an overview and background, prior to the first class, please read:


As background for the biology/biochem/physiology section:


Garcia-Mantrana I, Collado MC. Obesity and overweight: Impact on maternal and milk microbiome and their role for infant health and nutrition ; *Mol Nutr Food Res.* 2016 May 9

REQUIREMENTS:

Students are expected to attend all classes. Special allowances will be made for students with legitimate conflicts that are communicated to the faculty in advance. For missed classes, students should answer the discussion questions in writing and submit them to the instructors.

Students are expected to come to class prepared: this requires that you carefully read the assigned article, work on the interpretation of graphs and tables, think about the issues raised in advance by the discussant, and do any background reading that might be required to understand the paper.

Students are expected to actively participate in the discussions. Don’t be timid about voicing your opinions. Remember, there are no dumb questions, and don’t be afraid to be wrong. You will not be judged on wrong answers! Students who do not regularly participate in discussions are at risk of receiving an "L" in the course. Grades are based on class participation (30%), leadership of discussion sessions (35%), and the written work (35%).

Students’ Responsibilities as Discussants:

1. Serve as primary discussant for 2 papers.

2. Identify the key issues relevant to judging the quality and scientific contribution of the paper. For example, for many epidemiology papers, the focus is on sample selection, adequacy of sample size, quality of exposure and outcome data, measurement error, etc., while the issues for papers in other areas might relate to whether the correct animal model was chosen to test a hypothesis, whether the experimental design has sufficient power and is able to elucidate mechanisms, etc. In addition, think about how you can integrate information from each paper with other papers we have discussed, or other papers you have read, to address the broader question.

3. Develop a set of questions, centering on #2 above, to guide the review and discussion of the paper. Please email the questions to the 2 instructors for review and approval one week prior to the class (exception for the first class session), and then distribute to the rest of the class by email at least 5 days before the class so students have adequate time to prepare. Discussion questions should focus on issues most relevant to the paper, and cover design, sample, key theoretical issues, interpretation of graphs and tables, etc. Please consult with one of the class instructors and/or the “expert” about appropriate discussion questions.

4. Begin the class session with a 5 minute overview and summary of the paper. Identify the key issues relevant to the quality and significance of the paper. Identify the main point of the paper, and provide any additional background you think is needed to understand the paper. Guide the discussion and evaluation of the paper.

Written work:

For each of the 2 research design sessions, students should prepare a 1 page (~500 words) statement TO BE SUBMITTED BY NOON ON THE FRIDAY PRIOR TO THE RESEARCH DESIGN SESSION. This should:

1. Identify a key unanswered research question (1-3 sentences)
2. State a specific hypothesis
3. Outline a general approach to test the hypothesis
   a. identify a population/sample
      i. animal or human?
      ii. Exclusions?
      iii. basic characteristics of “subjects”
   b. describe what will be done:
      i. protocol/intervention
      ii. approach to data analysis
4. Briefly summarize implications of findings

Students should adhere to the UNC Honor code. For written assignments, students may brainstorm research design ideas with one another, but written work should be done independently.
Schedule of Classes

Aug 29  Introduction, choice of topics

Sept 5  NO CLASS. LABOR DAY

Section 1: Epidemiology: Observational studies, and RCTs

What has been observed in population-based studies relating breast-feeding to later obesity and cardiometabolic disease? What are some of the key strengths and weaknesses of epidemiologic studies, and is there a basis for causal inference? Owing to ethical concerns, women cannot be randomized to breastfeed or formula feed their infants. Thus, the literature includes some RCTs of breast-feeding promotion, but these may still be limited in providing evidence for causal inference.

Sep 12  Student meetings with discussant partner

Sep 19  Observational Epidemiology Studies:


Section 2: The underlying biology and Physiology


Nov 9: Research Design Discussion

Section 3: Behavior, Intervention, and Policy issues


Nov 28 Policy

Dec 5 IP Research Design Discussion