Course Description and Objectives:

Brain research and Education also known as Educational Neuroscience brings together individuals from diverse backgrounds, including cognitive brain scientists, learning scientists, medical and clinical practitioners, and those in educational policy and teaching. These different stakeholders (not just researchers) are joined in their mutual “two-way” communication, with a commitment (a) to solve prevailing problems in the lives of developing children, (b) to understand the human learning capabilities over the life span (both in brain and in behavior), and (c) to ground educational change in the highly principled application of research that employs both behavioral as well as a multitude of modern methodologies, especially brain imaging. This discipline provides the most relevant level of analysis for addressing today’s core problems in education. Educational Neuroscience draws its empirical strength from its sister disciplines, Cognitive Neuroscience, Affective Neuroscience and Developmental Neuroscience, which combine decades of experimental advances from cognitive, perceptual, and developmental and social psychology with a variety of contemporary brain imaging technologies for exploring the neural basis of human knowledge over the life span.

This is an Introductory graduate Educational Neuroscience course in which we explore the neural basis of development and applications to education. This course will focus on core areas of Human Development including Cognition (Attention, Memory, and Executive Functions), Language (spoken, written, signed, monolingual and bilingual), Reading, Numeracy, Emotion, Social, as well as Genetic and Epigenetic mechanisms involved in development. The assumptions and Methods used in the field of Educational Neuroscience will be covered as well as the translation of research findings into real world applied and educational settings.

Course Goals:

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

• Understand theoretical perspectives in Educational Neuroscience, including their strengths and weaknesses.
• Recognize the importance of the interaction between children and their environment, and how core processes change with age and experience.
• Develop the ability to critically evaluate scientific research and interpret research findings.
• Explore implications for translational issues relating to education and public policy.
Evaluation & Course Grading:

1. **Preparation questions each class (10%)**
   Students are required to prepare questions on each of the articles (other than the ones they are presenting). These questions are directed at fostering critiques and discussion of the strengths and weaknesses of the articles. Each student will submit three questions on Canvas by the Sunday before class.

2. **Presentation of a research article in class (30%)**
   Students will summarize and critique a particular article to the class. Three students will present each week. Presentations for each class will be assigned across the group. You will not be required to “teach” the course, as all members of the group will be expected to participate. However, your role will be to direct the discussion to pertinent and interesting issues. Ideally, you should begin with a brief review of the papers and introduce questions for discussion (QALMRI guide from Stephen Kosslyn is a helpful guide for how to do this). You may also review comments on the Discussion Board to help structure your time. Powerpoint is discouraged, but two or three slides allowed to orient the class.

3. **Research Proposal Blitz presentations (10%)**
   In class presentations of your research proposal.

4. **Final Research Proposal (35%)**
   The final examination consists of a 10 page grant proposal on a topic within Educational Neuroscience, following guidelines for a postdoctoral research proposal from NSF.

5. **In class Participation is a key part of the course (15%)**
   The final examination consists of a 10 page proposal on a topic within Educational Neuroscience.

University Policies and Resources

As a student, you have the responsibility to be familiar with and uphold the *Code of Academic Integrity* and the *Code of Conduct*, as well as for notifying your course instructors in a timely fashion regarding academic accommodations related to absences and accessibility as indicated below.

You also have the right to know the expectations set by University Policy. The University of Maryland values the diversity of its student body and is committed to providing a classroom atmosphere that encourages the equitable participation of all students.

University Policies outlined at this link are particularly relevant to your experience in academic courses: http://apps.gradschool.umd.edu/Catalog/policy.php?the-academic-
Topics that are addressed in these policies include academic integrity, student and instructor conduct, accessibility and accommodations, attendance and excused absences, grades and appeals, copyright and intellectual property.

**Course Evaluations:**
As a member of our academic community, you as a student have a number of important responsibilities. One of these responsibilities is to submit your course evaluations each term though CourseEvalUM in order to help faculty and administrators improve teaching and learning at Maryland. Please make a note now of the dates for *Fall 2010 (Tuesday, November 30 through Sunday, December 12)* and the link at which you can access the submission system ([www.courseevalum.umd.edu](http://www.courseevalum.umd.edu)). If you submitted all of your evaluations in the fall or are a new student, you can also access all posted results from Fall 2007 forward via Testudo under CourseEvalUM Reporting. To retain this access, you must submit all of your evaluations each semester. If you do not have access right now, you can gain it by submitting all of your Fall 2010 evaluations. More information is at: [www.irpa.umd.edu/Assessment/CourseEval/stdt_faq.shtml](http://www.irpa.umd.edu/Assessment/CourseEval/stdt_faq.shtml).

**CLASS POLICIES**

**Academic integrity:** The University of Maryland, College Park has a student-administered Honor Code and Honor Pledge. For more information on the Code of Academic Integrity or the Student Honor Council, please visit [http://www.studenthonorcouncil.umd.edu/whatis.html](http://www.studenthonorcouncil.umd.edu/whatis.html). This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. The code prohibits students from cheating, fabrication, facilitating academic dishonesty, and plagiarism. Instances of this include submitting someone else’s work as your own, submitting your own work completed for another class without permission, or failing to properly cite information other than your own (found in journals, books, online, or otherwise). Any form of academic dishonesty will not be tolerated, and any sign of academic dishonesty will be reported to the appropriate University officials.

**Special needs:** If you have a registered disability that will require accommodation, please see the instructor so necessary arrangements can be made. If you have a disability and have not yet registered with the University, please contact Disability Support Services in the Shoemaker Building (301.314.7682, or 301.405.7683 TTD) as soon as possible.

**Religious observances:** The University of Maryland policy on religious observances states that students not be penalized in any way for participation in religious observances. Students shall be allowed, whenever possible, to make up academic assignments that are missed due to such absences. However, the must contact the instructor before the absence with a written notification of the projected absence, and arrangements will be made for make-up work or examinations.
Course evaluations: As a member of our academic community, students have a number of important responsibilities. One of these responsibilities is to submit course evaluations each term through CourseEvalUM in order to help faculty and administrators improve teaching and learning at Maryland. All information submitted to CourseEvalUM is confidential. Campus will notify you when CourseEvalUM is open for you to complete your evaluations for fall semester courses. Please go directly to the website (www.courseevalum.umd.edu) to complete your evaluations. By completing all of your evaluations each semester, you will have the privilege of accessing online, at Testudo, the evaluation reports for the thousands of courses for which 70% or more students submitted their evaluations.

Late Assignments: All assignments are expected on the day indicated in this syllabus.

Spring 2019; EDHD755 Topics & Readings

assignment received after the due date will automatically receive a 5% lower grade for

Week 1, January 29: University closed due to inclement weather

Week 2 February 5, Introduction to the Course: overview & Content, Assignments and grading + Introductions

Week 3, Feb 12, Assumptions, Topics & Controversies
DOI: 10.1177/2377616115618036

Week 4 Feb 19 Neurology Neuroscience Neuroimaging Methods
Week 5, Feb 26: The development of the brain and Sensitive Periods


Week 6, Feb 26: Memory and Human development


Week 7. March 5 Being and Becoming Bilingual


The “Perceptual Wedge” hypothesis as the basis for bilingual babies’ phonetic processing advantage: New insights from fNIRS brain imaging. Brain Lang. 2012 May; 121(2): 130–143. doi: 10.1016/j.bandl.2011.05.003

Week 8, March 12  Dyslexia & Reading


Spring Break, March 17-March 24

Week 9: March 26  Numeracy & Dyscalculia


Week 10, March 26 Executive functions & ADHD


Week 11, April 2  The HPA Axis Stress, Poverty


Week 12  April 9 Social and affective Neuroscience in childhood and adolescence


Reading 3 To be announced.

Week 13, April 23 Development of Higher level Thinking & Reasoning


Week 14 April 30  Proposal Blitz brief presentations

Week 15, May 7  Proposal Blitz brief presentations

Week 16. May 14, Putting it all together: Evaluating the place of Educational Neuroscience in Contemporary education. Are we there yet and where are we going?