**Cognitive Neuroscience**

Psychology 361, Spring 2019, Block 7

Instructor: Dr. Steven Neese

Office/Hours: Law Hall 106D, Mon.1:00-2:00 or by appointment

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**Text:**  Gazzaniga, M.S., Ivry, R.B., & Mangun, G.R. (2014). *Cognitive Neuroscience, the Biology of the Mind, 4th Edition.* New York, NY. Norton.

**Course Description:** Cognitive neuroscience is the intersection of cognitive psychology and neuroscience. Using a multidisciplinary approach along with diverse and converging methods, this course aims to characterize the neural mechanisms that the brain uses to support complex cognitive processes. Through a combination of lectures, readings, discussions and oral presentations students will be introduced to a broad range of topics studied by cognitive neuroscientists.

**Meeting Times:** Monday-Friday, 9am-11am and Tuesday, Wednesday, and Thursday, 1pm-3pm.

**Educational Priorities and Outcomes:** The components of the course fosters the Educational Priorities and Outcomes of Cornell College as follows:

**Learning outcomes - After successfully completing this course, you will be able to:**

1. Understand the methods used to study human cognition and its neural substrates and understand how neural functions support cognitive processes and how multiple cognitive processes are intertwined (*knowledge* via exams).
2. Be able to read, interpret, and critique experimental evidence pertaining to current theories and hypotheses in cognitive neuroscience (*inquiry and reasoning* via exams, class presentations and specific aims of grant proposal).
3. Articulate and to organize information about cognitive neuroscience in a clear and concise manner (*communication* *and ethical behavior* via grant proposal and oral presentation of grant).

**Summary Statement:** This course supports the Educational Priorities and Outcomes of Cornell College with emphases on knowledge, inquiry, reasoning, and communication.

**Absence Policy:** Students are allowed a total of **2 unexcused absences** (2 morning sessions; 1 morning/1 afternoon, etc.). Given the nature of this course, missing even a single day of classwork can put you behind. Please notify me if you are planning on missing a course period and ask another class member to pass on the information you missed. More than 2 unexcused absences will result in your **final grade** being *lowered by 1/3*.

**Tardiness Policy:** Arriving late to class is disruptive to others. Therefore, all students should arrive on time for each class session. Excessive tardiness (>3 times) will result in your **final grade** being *lowered by 1/3*.

**Grading:**

**Exams (3 x 100 points):** There will be 3 exams during the block. Each of the exams will be worth 100 points each and will mainly focus on the sections of reading material and class discussions from that period of the course (see course schedule below). **Make-up exams will be given only for an approved reason and scheduled within 2 days of the actual exam date.**

**Grant proposal:** Students will pick a topic of interest and prepare a grant proposal. This exercise will consist of the following:

1. **Specific Aims Draft** **(25 points):** A **one page** specific aims draft will be due during the second week of the block that should include everything about your application that is important and exciting without the detail. Grading criteria are listed in Appendix 1.
2. **Grant Proposal** **(100 points):** A completed proposal will be due during the third week of the block. This submission will include a title page, a specific aims page, a background and methodology section (**not to exceed 5 pages**), and a reference page. Grading criteria are listed in Appendix 2.
3. **Oral Presentation (20 points):** Near the end of the semester you will make a brief presentation to the class that provides an overview of your grant proposal. This presentation will be modeled after the APA Annual Convention oral presentation. You will have 10 minutes to present your research proposal, followed by a few minutes to answer questions from the audience. The use of PowerPoint presentation software will be necessary and appropriate attire is required. Grading criteria are listed in Appendix 3.

**Additional Presentation Assignments (45 points):** One goal of this course is to enhance your ability to articulate your knowledge about topics of cognitive neuroscience in a public forum. To achieve these goals you will work in small groups to present materials to the class. Presentations will be graded for creativity and accuracy, as assigned.

**Class participation (25 points):** I expect all in class to join in discussions to contribute to the class. You are expected to participate during class both by asking questions and actively listening to others. Be both vocal and patient. Try to answer the questions that I pose and ask questions yourself. **I tend to talk fast at times so ask me to repeat what I said when I have been unclear.** If I make a mistake, point it out for me. This grade will be a culmination of attendance, classroom behavior, completion of activities in class/lab, and respectful behavior towards students and instructor.

**The grade scale is:**

93 or above (A) 83-86% (B) 73-76% (C) 63-66% (D)

90-92% (A-) 80-82% (B-) 70-72% (C-) 60-62% (D-)

87-89% (B+) 77-79% (C+) 67-69% (D+) below 60 (F)

Tests: 3 x100 = 300 points

Specific Aims draft = 25 points

Grant Proposal = 100 points

Grant presentation = 20 points

Class presentations = 45 points

Class participation = 25 points

Total = 515 points

**Technology in class:**

1. **Laptop computers:** Please bring your laptop to class daily.
2. **Cell phones:** Cell phone interruptions are unnecessary, so please ensure that your cell phone does not ring during class. Text messaging during class time is inappropriate, and using the phone as a clock can be disruptive. **We will discuss the cell phone policy in depth on the first day of classes.**

**Cornell College Policies:**

**Academic Honesty expectations:** Cornell College expects all members of the Cornell community to act with academic integrity. An important aspect of academic integrity is respecting the work of others. A student is expected to explicitly acknowledge ideas, claims, observations, or data of others, unless generally known. When a piece of work is submitted for credit, a student is asserting that the submission is her or his work unless there is a citation of a specific source. If there is no appropriate acknowledgement of sources, whether intended or not, this may constitute a violation of the College’s requirement for honesty in academic work and may be treated as a case of academic dishonesty. The procedures regarding how the College deals with cases of academic dishonesty appear in The Catalogue, under the heading “Academic Honesty."

**Students with disabilities:** Cornell College makes reasonable accommodations for persons with disabilities.  Students should notify the Coordinator of Academic Support and Advising and their course instructor of any disability related accommodations within the first three days of the term for which the accommodations are required, due to the fast pace of the block format.  For more information on the documentation required to establish the need for accommodations and the process of requesting the accommodations, see [Cornell College Website](http://www.cornellcollege.edu/academic-support-and-advising/disabilities/index.shtml).

*These guidelines are described in detail to serve as a point of reference should questions arrive. This document serves as a contract between the student and the instructor.*

**Schedule:**

| **Date** | **Topic/ Reading** | **Lab Session/Assignment Due** |
| --- | --- | --- |
| M March 18 | Introduction  Need for Cognition Neuroscience |  |
| T March 19 | History of Cognition Neuroscience  **Chapter 1** |  |
| W March 20 | Review of the Nervous System  **Chapter 2 (Skip pages 60-67)** |  |
| R March 21 | Hemispheric Specialization  **Chapter 4** |  |
| F March 22 | Methods in Cognition Neuroscience  **Chapter 3** |  |
| M March 25 | **Exam 1: 9 am** |  |
| T March 26 | Sensation and Perception  **Chapter 5** |  |
| W March 27 | Object Recognition  **Chapter 6 (Skip pages 261-271)** | **Specific aims draft due: 9 am** |
| R March 28 | Attention  **Chapter 7** |  |
| F March 29 | **Grant proposal meeting day** |  |
| M April 1 | Action  **Chapter 8** |  |
| T April 2 | **Exam 2: 9 am** |  |
| W April 3 | Memory  **Chapter 9** |  |
| R April 4 | Language  **Chapter 11** |  |
| F April 5 | Emotion  **Chapter 10** | **Grant proposal due: 9 am** |
| M April 8 | Cognitive Control  **Chapter 12** |  |
| T April 9 | Grant presentations |  |
| W April 10 | **Final Exam: 9 am** | **No Lab** |

**Appendix 1: Specific Aims Draft Scoring Rubric (25 points)**

|  |  | **Possible Score** |
| --- | --- | --- |
| **Introduction** | Introduction of key question(s), terms, definitions, etc. | 5 points |
| **Specific Aims** | States a specific  testable research  question(s). | 5 points |
| **Conclusion** | Discussion of the potential impact of the research question(s). | 5 points |
| **Grammar & Mechanics** | Grammatical errors, spelling and punctuation. | 5 points |
| **Style & Communication** | Consistent style. “Scholarly” with proper flow and ease to follow. **One page.** | 5 points |

**Appendix 2: Grant Proposal Scoring Rubric (100 points)**

| **Category** | **Rating** |  |  |  |
| --- | --- | --- | --- | --- |
|  | **0-3** | **4-5** | **6-7** | **8-10** |
| **Introduction and Literature Review** | Introduction and/or background not provided | Provides an introduction and background that is insignificant to the experiment | Provides an introduction and background that is only somewhat significant to the experiment | Provides a clear and thorough introduction and background |
| **Purpose and Objectives** | No research question(s) posed. | States a vague, untestable research question(s). | States a clear, but untestable research question(s). | States a specific testable research question(s). |
| **Methodology** | Explanation of experimental methods missing. | Provides an unorganized explanation of experimental methods. | Provides an adequate explanation of proposed experimental methods. | Provides a clear explanation of the proposed experimental methods. |
| **Justification** | Rationale and significance of proposed work not articulated. | Presents rationale and significance of proposed work in the form of a weak, unstructured argument. | Shows some effort to present the rationale and significance of proposed work in the form of a well- structured argument. | Presents rationale and significance of proposed work in the form of a well- structured, logical argument. |
| **Argument Structure** | No conclusions articulated explaining why the proposed method should be used. | Provides conclusions explaining why the proposed method should be used but no concrete evidence in the form of examples. | Provides conclusions explaining why the proposed method should be used, but weak evidence, i.e. no specific (only generalized) examples to support the conclusions. | Provides strong, clear, convincing conclusions why the proposed method should be used and evidence, i.e. relevant examples to support the conclusions. |
|  | **0-3** | **4-5** | **6-7** | **8-10** |
| **Limitations/ Future Directions** | Neither the limitations nor the future directions are clear. | Either the limitations or the future directions are clear. | The limitations or the future directions are presented in a general format. | The limitations or the future directions are presented in a clear and distinct format. |
| **Grammar** | There are > 8 grammatical/ spelling errors. | There are 6-7 grammatical/ spelling errors. | There are 4-5 grammatical/ spelling errors. | There are <3 grammatical/ spelling errors. |
| **Articles** | Information is gathered from 2 sources. | Information is gathered from 4 sources. | Information is gathered from 6 sources. | Information is gathered from 8 sources. |
|  | **0-2** | **2** | **3-4** | **5** |
| **Specific Aims/**  **Hypotheses** | Specific aims missing. | Specific aims incomplete. | Specific aims present with some rationale. | Specific aims present with clear hypotheses. |
| **Describe relevant data to be collected** | Does not explain data. | Briefly describes data. | Describes data but does not fully justify. | Fully describes & justifies data to be collected in the context of testing the hypotheses. |
| **Reference Sheet** | Information is not cited or is cited incorrectly. | Information is cited, but has errors. | Information is cited properly. | Information is cited properly and in APA format. |
| **Format** | Font, spacing, and page number are incorrect. | Font, spacing, or page number is correct. | Font and spacing, font and page number, or spacing and page number are correct. | Font, spacing, and page number are correct. |

**Appendix 3: Oral Presentation Scoring Rubric (20 points)**

| **Category** | **Rating** |
| --- | --- |
|  | **0 - 5** |
| **Importance/ Hypothesis** | Introduce importance of general research area, central theories and empirical findings in this area, and select citations. Introduce the specific research question(s) you’ll focus on, state hypotheses and specific aims. |
| **Experimental Design** | Show your research design (including IVs and DVs), methodology, and timeline. |
| **Discussion of potential findings.** | Clearly explain your expected findings and what they might mean. Potential limitation also discussed. |
| **Response to Questions**  **/ Speaking Skills/ Presentation Length** | Demonstrates full knowledge of topic; explains and elaborates on all questions. Has natural delivery; modulates voice; articulate; projects enthusiasm, interest, and confidence; uses body language effectively; proper volume; steady rate; good posture and eye contact: length within +/- 2 minutes of goal. |