

01:185:350 Fundamentals of Cognitive Neuroscience  
 Class Meeting times: TBD  
 Index Number: TBD

Course Instructor	
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**Description**

How does our brain give rise to our abilities to perceive, act and think? This course explores the cognitive and neural processes that support attention, learning, memory, language, and guided behaviors with an emphasis on the neural mechanisms that form the substrates of human cognition. It introduces basic neuroanatomy, functional imaging techniques, and behavioral measures of cognition, and discusses methods by which inferences about the brain bases of cognition are made. This course also provides a survey of current research in cognitive neuroscience. Representative topics include perceptual and motor processes, decision making, learning and memory, attention, reward processing, reinforcement learning, sensory inference and cognitive control.

**Learning Objectives - Students Who Complete This Course Will:**

1. Understand the methods used to study human cognition and its neural substrates.
2. Understand how neural functions support cognitive processes and how multiple cognitive processes are interdependent.
3. Be able to read, interpret, and critique experimental evidence pertaining to current theories and hypotheses in cognitive neuroscience.
4. Be able to organize information about cognitive neuroscience in a clear and concise manner.

## Textbook

1) Cognitive Neuroscience: The Biology of the Mind, 5th Edition  
by Michael S. Gazzaniga (Author), Richard B. Ivry (Author), George R. Mangun (Author)

ISBN-13: 978-0393603170

ISBN-10: 0393603172

2) Supplemental primary research articles will be posted on Canvas throughout the semester.

## Academic Integrity

Each student in this course is expected to abide by the Rutgers University Code of Student Conduct and Academic Integrity Policy. The policies found in the Rutgers Academic Integrity Policy (<http://academicintegrity.rutgers.edu/>) apply to this course. Integrity is the practice of being honest and showing a consistent and uncompromising adherence to strong moral and ethical principles and values. (<https://en.wikipedia.org/wiki/Integrity>).

Of course, you are encouraged to study together and to discuss information and concepts covered in lecture and the sections with other students. You can give "consulting" help to or receive "consulting" help from such students. However, this permissible cooperation should never involve one student having possession of a copy of all or part of work done by someone else, in the form of an e-mail, an e-mail attachment file, online forums, a flash drive, or a hard paper copy. Please ask me if you are writing something and would like assistance in appropriate ways to cite previously published work. That's one great reason to schedule an office hour appointment! For info and useful links, visit: the Rutgers Academic Integrity Policy (<http://academicintegrity.rutgers.edu/>)

Should copying occur, both the student who copied work from another student and the student who gave material to be copied could both automatically receive a zero for the assignment. Penalty for violation of the University Code of Student Conduct can also be extended to include failure of the course and University disciplinary action. The risk really isn't worth it.

During examinations, you must do your own work. Talking or discussion is not permitted during the examinations, nor may you compare papers, copy from others, or collaborate in any way. Any collaborative behavior during the examination will result in failure of the exam, and may lead to failure of the course and University disciplinary action.

## Accommodations For Students With Disabilities

In compliance with the Rutgers University policy and equal access laws, I am available to discuss appropriate academic accommodations that may be required for student with disabilities. Requests for academic accommodations are to be made during the first two weeks of the semester, except for unusual circumstances, so arrangements can be made. Students are encouraged to register with the RU Office of Disability Services to verify their eligibility for appropriate accommodations and provide me with appropriate documentation.

<https://ods.rutgers.edu/>

<http://health.rutgers.edu/>

Health and Wellness

<http://health.rutgers.edu/>

## Inclusivity Statement

We understand that our members represent a rich variety of backgrounds and perspectives. The Psychology Department is committed to providing an atmosphere for learning that respects diversity. While working together to build this community we ask all members to:

- share their unique experiences, values and beliefs
- be open to the views of others
- honor the uniqueness of their colleagues
- appreciate the opportunity that we have to learn from each other in this community
- value each other's opinions and communicate in a respectful manner
- use this opportunity together to discuss ways in which we can create an inclusive environment in this course and across the Rutgers University community

## Course Requirements

*General course requirements/notes:*

1. **CANVAS.** It is expected that all students will regularly access CANVAS for course announcements and materials. Please also make sure that you check your Rutgers email regularly.
2. **University e-mail accounts** should be checked at least daily by the student because this will be the primary means for sending information to the class or contacting individual students. Failure to monitor your e-mail effectively is not an excuse for not having course information or for not following up on course issues in a timely manner.
3. **Regular access to a computer** with Internet, #2 pencil for all exams.
4. **Attendance.** Attending class is essential to the learning process. Please don't be late to class and be in attendance every time. Regular class attendance is expected. Further, some exam questions will be drawn from material presented in the lecture that is not repeated in the textbook; thus, it is in your best interest to attend all classes. Our time is short and swift in this face-paced format. If you miss a class meeting, you will still be responsible for material covered in class. In the case of an excused absence (such as religious and intercollegiate athletics absences), medical emergency or other extreme circumstances, it is the student's responsibility to contact another student, determine what material / announcements they missed, and take appropriate action to catch up, as necessary.
5. **Late assignments.** Assignments not handed in before the beginning of lecture at 6:05 pm are considered LATE – no exceptions! Submitting your work any time after this on the same day will result in a 10% penalty. Each day after will result in a further 20% penalty.
6. If you are not performing as well as you would like it is your **responsibility to meet with me.** I am here to help you learn.

<u>Exams And Other Assessments</u>	<u>Percentages</u>
2 Midterm Exams	50%
Literature Critique/Poster Presentations	25%
Cumulative Final Exam	25%

Final grades will be determined by the following (standard Rutgers grading scale):

90.00 % and above	A
85.00-89.99%	B+
80.00-84.99%	B
75.00-79.99%	C+
70.00-74.99%	C

60.00-69.99%	D
below 60.00%	F

### *Make-Up Policy*

No make-up exams will be given unless arrangements are made prior to the day of the exam/assignment due date or written proof of unavoidable absence is provided (e.g., doctor's note; religious and intercollegiate athletics absences). Make-up exams may be in essay format. If exceptional circumstances prevent you from taking an exam (e.g., car accident), it is important that you contact the instructor within 24 hours. In some circumstances without a documented but still valid reason for your absence on an exam day, you may take a make-up exam with a 10-90% deduction in points (at the instructor's discretion).

### *Literature Critique/Poster Presentation*

The goal of this assessment is to get students to read original research articles with a focus on the methods used to investigate the question under consideration. Students must review 2 articles that address a common topic, but use two different methods (e.g., patient study and functional imaging study; single cell recording and patient study). It is highly recommended that students discuss their planned topic with the instructor prior to the due date. For the critique, you will be graded per the attached rubric. For the poster, you will be graded on the content, format and presentation of the poster.

For this assessment, students have two options (choose 1).

#### Option 1

Produce a written critique of the articles (3-5 pages; double-spaced). Late papers will be penalized. These critiques should 1) summarize the articles, 2) describe potential drawbacks, 3) provide recommendations for how to address the criticisms you have raised.

#### Option 2

Create a poster presentation with the following content:

- a. Summary of the articles
- b. Discussion/critique of the articles
- c. Future experiments that build upon the findings

### **Changing Grades**

Students sometimes ask professors to change final grades, usually based on the need to achieve a certain grade in order to, for example, get into the business school, retain a scholarship, or avoid academic probation. Although I wish all of you the best of success in your studies, you hopefully can understand how changing one student's grade is unfair to the other students in the class. Therefore, requests for exam score or grade changes will not be entertained. Your final grade will be based solely on the your scores on the course exams and literature critique or poster presentation.

## Schedule of Course Topics

Note: Supplemental primary research articles will be posted on Canvas throughout the semester

### PART I Background and Methods:

- Week1 Ch 1 A Brief History of Cognitive Neuroscience  
Week 2 Ch 2 Structure and Function of the Nervous System  
Week 3 Ch 3 Methods of Cognitive Neuroscience

### PART II Core Processes:

- Week 4 Ch 4 Hemispheric Specialization  
Week 5 Ch 5 Sensation and Perception  
-----Midterm 1 (#1-4)  
Week 6 Ch 6 Object Recognition  
Week 7 Ch 7 Attention  
-----submit Literature Critique/Poster Presentation topic for approval  
Week 8 Ch 8 Action  
Week 9 Ch 9 Memory  
Week 10 Ch 10 Emotion  
-----Midterm 2 (#5-9)  
Week 11 Ch 11 Language

### PART III Control Processes:

- Week 12 Ch 12 Cognitive Control  
Week 13 Ch 13 Social Cognition  
Week 14 Ch 14 Consciousness, Free Will, and the Law  
Week 15 Literature Critique/Poster Presentations

Exam Period -----Final Exam TBD <https://finalexams.rutgers.edu/>