

**PSY 370 – COGNITIVE NEUROSCIENCE
GRAND VALLEY STATE UNIVERSITY
WINTER, 2024**

**Section 01: TR 11:30 am – 12:45 pm, 2302 Au Sable Hall
Section 02: TR 2:30 pm – 3:45 pm, 148 Honors College
Section 03: TR 8:30 am - 9:45 am, 164 Lake Ontario Hall**

INSTRUCTOR: Joel Quamme, Ph. D.
OFFICE: 1311 Au Sable Hall
PHONE: 1-2153 (**not recommended**)
E-MAIL: quammej@gvsu.edu (**recommended**)
OFFICE HOURS: TR 10:00 am – 11:15 am, or by appointment.

REQUIRED TEXT:

GVSU SAVE PSY370 1ST DAY DIGITAL ACCESS to Gazzaniga, Ivry, & Mangun (2018)
Cognitive Neuroscience; The Biology of the Mind (5th ed). New York: Norton, ISBN-13: 9780393603170

All students enrolled in this class are automatically given access to this e-text through the GVSU Save program the first day of class. GVSU Save will automatically charge your account for these materials.

You have the choice to opt-out of GVSU Save and purchase this text elsewhere. If you wish to opt out, you must do so by Friday 1/19/24 to avoid having your account charged.

PREREQUISITES:

Completion of Psychology 101 (Introduction to psychology) and Junior standing or higher.

COURSE DESCRIPTION

Cognitive Neuroscience seeks to explain how the brain gives rise to the functions of the mind. This class will explore the neural basis of higher cognitive processes, including object recognition, attention, memory, language, and executive control, as well as interactions among cognition, emotion, and social behavior & judgments. The course emphasizes contemporary theories of how cognitive processes are implemented in the brain, and the findings of empirical research into brain-cognition relationships.

Students will be introduced to the wide variety of methods used by cognitive neuroscientists to understand the brain substrates of cognition, including studies of patients with neuropsychological impairments, imaging and recording of brain activity during cognitive performance, electrical and magnetic stimulation of brain regions, computational modeling of neural systems, and cognitive analysis of behavioral performance. We will critically examine how cognitive neuroscientists use these methods to draw inferences about the neural basis of cognition, and how the findings of cognitive neuroscience research are presented to the public.

COURSE OBJECTIVES

My goal is that by the end of the course, students will be able to:

- Identify the historical roots of the modern study of cognitive neuroscience, including major philosophical and scientific developments.
- Describe the modern methods of cognitive neuroscience, analyze their strengths and weakness, and evaluate their application to different kinds of research problems.
- Analyze contemporary theories and evidence of the neural bases of core cognitive processes, including recognition, attention, memory, language and executive control of behavior and judgments.
- Comprehend primary literature on the neural basis of cognition and draw scientific conclusions from data of cognitive neuroscience studies.
- Critically evaluate claims about the neural basis of cognitive phenomena, such as those encountered in popular media.

GRADING

Grades will be computed based on your performance on three exams, quizzes on the material covered each week, and number of other assignments based on additional readings and online or in-class activities, or homework

3 Non-cumulative Exams:	60%
Weekly Quizzes:	20%
Assignments:	20%

Grading scale. The percentage of total credit you earn will be converted to letter grades according to the following scheme:

A	100-94	A-	90-93	B+	87-89	B	83-86
B-	80-82	C+	77-79	C	73-76	C-	70-72
D+	67-69	D	60-66	F	59 or lower		

Exams. There will be three *non-cumulative* exams, each worth 20% of your grade (for a total of 60%). The exams will contain a mix of multiple choice and other formats such as short answer, completion, and labelling. The material tested on exams will come from lecture material, class activities, textbook, and any other assigned readings.

Re-scheduling or making up an exam will be allowed solely at my discretion. I will excuse a missed exam related to a university-sanctioned event, a personal illness, family emergency, or major religious holiday provided you (1) can give me advance notice of at least one week (if your absence is foreseeable), or a timely explanation on your return (if the absence is unforeseeable), and (2) you can provide me with documentation from an appropriate faculty member, university administrator, physician, or clergy member. An unexcused absence from an exam will constitute a score of 0.

Weekly Content on Blackboard: each week of the semester I will post module on blackboard consisting of materials to read or view, and assignments or activities to complete that week. Modules will consist of a folder on blackboard with links to all content. Modules may include the following:

- *Assigned textbook sections to read:* A link to specific textbook chapter to read that week.

- Videos to watch: I may upload videos illustrating or describing important concepts, or lecture videos with additional discussion of things we are covering in class. For instance, I may post a lecture video covering some background I want you to know before a class meets, or I may post something to cover additional topics we didn't get to in class.
- Lecture slides & other materials to download: I will make available all power-point slides presented in class. Occasionally there will be guides, worksheets, or other documents as well.
- Quizzes and Assignments to complete: There will also be a number of graded activities to do, including quizzes and assignments. These will all be completed and submitted online, on Blackboard. More information about quizzes and assignments below:

Quizzes. During most weeks there will be a multiple-choice quiz covering fundamental points of the material from textbook chapters or chapter sections assigned that week. When a quiz is due, it will be posted to Blackboard on Monday and due the next Sunday night, by 11:59. Quizzes may be completed at any time before the deadline once they are available. Once begun, there is a time limit in which you must complete the quiz, but you are free to consult the book, notes, slides or other materials while taking it. Quizzes are worth 6 points total. Taking the quiz late will result in a 1 point penalty to the quiz score for each day it is late. I will let you skip two quizzes with no penalty, or I'll drop your two lowest scores.

Assignments. Throughout the semester, there will be a number of additional assignments to complete. The nature of these assignments will vary, but there two specific kinds of assignments scheduled:

ZAPS experiments are online simulations of classic experiments that illustrate cognitive processes under discussion in class or in the text. These will be posted within the weekly modules on blackboard and will have the same due dates as the quizzes. The experiments are worth 3 points each and there are 10 of them scheduled throughout the semester. To complete a ZAPS experiment, you will be asked to read some introductory background information, and answer some questions. Then, just follow the instructions to complete the experiment. Your responses will be collected, and at the end, you will see your results along with some concluding information about how the results are interpreted, and there will be a few final questions to answer. Most ZAPS experiments will take around 20 minutes to complete.

Article Assignments: will require you to read an article related and answer questions about it relating to material from lecture and textbook. These may also incorporate information from videos, ZAPS experiments, or information from in-class activities, exercises or discussions. Instructions for how to complete these assignments their specific due dates will vary, but they will be announced in class and made available on blackboard at least a week ahead of their due date. Six article assignments are assigned for the semester, but I'll take your top 5 scores for the grade and drop the lowest score. Or you can skip one without penalty.

PLAGIARISM

According to the 2008/9 GVSU Student Code, Section 223.01: "Any ideas or material taken from another source for either written or oral presentation must be fully acknowledged. Offering the work of someone else as one's own is plagiarism. The language or ideas taken from another may range from isolated formulas, sentences, or paragraphs to entire articles copied from books, periodicals, speeches or the writings of other students. The offering of materials assembled or collected by others in the form of projects or collections without acknowledgment also is considered plagiarism. Any student who fails to give credit in written or oral work for the ideas or materials that have been taken from another is guilty of plagiarism." **Detected plagiarism may result in a grade of 0% on any paper or assignment on which it occurs, and possibly an F in the course. You have been warned.**

ELECTRONIC DEVICES

Please turn all cell phones, pagers and other electronic devices with audible signals or alarms OFF during any virtual class meeting.

ACCOMODATION FOR DISABILITY

Any student in this class who has special needs because of a learning, physical, or other disability, please contact me or Disability Support Resources (DSR) at 331-2490.

CLASS SCHEDULE

The following schedule of class topics, reading assignments and due dates is tentative, and may need to be modified later in the course. Any changes to the schedule will be announced and a modified schedule will be posted to blackboard.

Week	Dates & Class Topics	Book chapters	Quizzes, ZAPS experiments, & Article Assignments (AA)
1	T 1/9 & R 1/11: Introduction; Historical and Philosophical Foundations	Ch. 1.1-1.5	Quiz 1
2	T 1/16 & R 1/18: Neurons & Neuroanatomy	Ch. 2.1-2.3	AA: <i>Philosophical Assumptions</i> Quiz 2
3	T 1/23: Neuroanatomy cont'd R 1/25: Behavioral methods	Ch. 2.4-2.6 Ch. 3.1	AA: <i>Modularity & Neurological Conditions</i> Quiz 3
4	T 1/30: Lesion & Stimulation Methods R 2/1: Cognitive Electrophysiology	Ch. 3.2-3.5	ZAPS: False Memory Quiz 4
5	T 2/6: Brain Imaging R 2/10: EXAM 1 (Ch 1, 2, 3)	Ch. 3.6-3.7	
6	T 2/13 & R 2/15: Object Recognition	Ch. 6.1-6.6	ZAPS Face Recognition AA: <i>Faces vs. Objects</i> Quiz 5
7	T 2/20 & R 2/22: Attention	Ch. 7.1-7.5	ZAPS: Selective Attention ZAPS: Visual Search Quiz 6
8	T 2/27 & R 2/29: Memory I	Ch. 9.1- 9.3	ZAPS: Memory Span Quiz 7
9	3/4-3/10 SPRING BREAK		
10	T 3/12 & R 3/14: Memory II	Ch. 9.4-9.6	AA: <i>Memory Systems</i> ZAPS: Encoding Specificity Quiz 8

11	T 3/19: EXAM 2 (Ch 6, 7, 9) R 3/21: Hemispheric lateralization	Ch. 4.1-4.3	ZAPS: Split Brain
12	T 3/26: Hemispheres cont'd R 3/28: Speech & Language I	Ch. 4.4-4.5 Ch. 11.1-11.3	ZAPS: Word Frequency Quiz 9
13	T 4/2 & R 4/4: Speech & Language cont'd	Ch. 11.4-11.6	ZAPS: Lexical Decision AA: <i>Language & Brain Activity</i> Quiz 10
14	T 4/09 & R 4/11: Cognitive Control	Ch. 12.1-12.7	ZAPS: Stroop Effect Quiz 11
15	T 4/16 & R 4/18: Affective & Social Cognition	Ch.10.1-10.3; 10.5-10.9	AA: <i>Emotion & Recognition</i> Quiz 12
Finals Week	11:30 Section (01): 4/23 Tuesday, 10:00am-11:50am 2:30 Section (02): 4/25 Thursday, 2:00pm-3:50pm 8:30 Section (03): 4/25 Thursday, 8:00am-9:50am		EXAM 3 (Ch 4, 11, 12, 10)