SCICOGN301, Advanced Cognitive Science
Neural Basis of Behavior
[Fall 2019]

SCICOGN301; Advanced Cognitive Science
Fall 2019

Classroom no: B25
Class times: Timeslot 3
Instructor: Andringa
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Office hours: on appointment

I. Track information

a. Prerequisites for this course: Introduction to Cognitive Science
b. This course serves as prerequisite for: n.a.
c. The course is part of the Cognitive science track, which consists of SCICOGN101 (Introduction to Cognitive Science), SCICOGN202 (Psycholinguistics) and SCICOGN301 (advanced Cognitive Science). See track document on the intranet.
d. Other courses which are relevant to this course – e.g. as part of a minor: Pharmacology, Biochemistry, Introduction to Psychology, Introduction to Life Science, Molecular and Cellular Physiology, Human Physiology.

II. Course description

This course builds upon the knowledge gained in the introductory course in Cognitive Science (SCICOGN101). It will deepen your knowledge of neurophysiology and neuroanatomy. Also your knowledge of experimental approaches in the field of cognitive neuroscience will be enhanced; such that you become able to evaluate research findings and to design own experiments. A selected number of higher order cognitive processes will be dealt with, including memory, emotion, social cognition, attention, consciousness, decision making and planning. In addition to established knowledge, current research questions will be discussed in depth.

III. Study Load

This course earns students four credits (7.5 ECTS). The class meets twice a week for two hours. **Preparation time is approximately 10 hours per week**.

IV. Course materials:

1. Required books and literature:

   Gazzaniga et al. Cognitive Neuroscience, 5th international student edition. (ISBN ISBN 978-0-393-66781-3).

2. Recommended books and literature:

   a. Page. Crash Course Pharmacology, 5th edition (e Book may work)

   b. All other materials will be posted on Moodle or can be find using our library resources.

3. Other materials: Website of the McGill University http://thebrain.mcgill.ca

Students are responsible for acquiring all assigned reading individually. All of the course's assigned journal articles are available through Utrecht University's Omega electronic journal subscription.

V. Course organization and requirements

a) Class meetings will encompass lectures, student presentations and discussion of group/individual work and in class assignments.
b) Although in class participation is not graded directly, active participation is of course expected from you as it will improve your learning.
c) It is essential that you prepare for class: read the assigned chapter(s) and perform the homework assignments. Deadlines for individual or group work are to be met. Missing deadlines means grade deduction.
d) Absenteeism needs to be communicated in advance whenever possible.
e) Missing an exam without proper reason and prior communication means scoring 0%. If you miss an exam with a proper reason that has been communicated in advance, you will be offered the opportunity to do the exam on Tuesday December 17, at 10 am. As this date is beyond the last day of classes, you have to file an extension form well in advance (see article 6.5.4 in student handbook).
f) Repeated lateness may affect your grade. Missing classes affects your grade as follows: missing 4 classes may lead to minor grade deduction, depending on your reasons for absence and whether or not I was informed on time. Missing 5 classes: 5 % grade deduction (of final grade). Missing 6 classes 10 % grade deduction. If you miss 7 or more classes you fail the course.
g) Use Moodle for submitting work. Submit all your work in Word, PDF or (f applicable) PowerPoint format.
h) Special needs: students with documented learning disabilities or special needs should make their needs known to the instructor at the start of the course.
i) Plagiarism is a serious academic offence which carries heavy sanctions. Acquaint yourself with the UCR Plagiarism Policy (see Student Handbook).
j) Use of mobile devices is not allowed during class time.
k) You are expected to speak English at all times.

This course is subject to UCR academic rules and procedures. Both students and instructors are required to know and follow these rules and procedures.

VI. Assessment

a) Midterm exam: 25 %
b) Final exam: 25 %
c) Research proposal: 20 %
d) Presentations combined: 10 %
e) In class and homework assignments: 20 %

ab) Midterm and final exam will consist of open questions. Scoring will take into account correctness/completeness of requested facts; reasoning about experimental designs and conclusions/clarity of answers.

c) Research proposal should have the format of a 3000 to 5000 words (excluding references) research proposal and is written in duo's. The proposal may deal with a study in any field of

the cognitive (neuro)sciences. This means the topic is not necessarily covered during class. During the 2nd week, I will check if your subject is appropriate. Feedback will be given both by me (multiple times) as well as by 2 of your peers. A log, tracking the amount of hours of each member and signed by all members of the group, is also requested. **See for details the document: "writing a research proposal" on Moodle.** Grading criteria are originality (15%), relevance (15%), feasibility/experimental design (20%), background knowledge / implementation of available literature (30%), organization/structure/writing (20%). Your final proposal should be submitted via Moodle. A paper version is required and should be handed with me in class or put in my pigeonhole.

c) Presentations of your proposal. In the 1st presentation (15 min + 10 min discussion; pass/ fail), you will briefly introduce the topic of your research. This presentation should provide the class with necessary background knowledge and should give you feedback on your initial plans. In the 2nd presentation (20 min. max + 10 min. discussion; 10 %), you will focus on the research questions and the experimental setup of your research proposal. Presenters should provide adequate materials (handouts, PowerPoint slides, to be posted on Moodle) for the audience. Scoring will be based on how well the audience understood facts and reasoning of the presentation and how well you were able to convince the audience of the feasibility, originality and relevance of your proposal.

d) Assignments

5%: Reviewing the research proposal of your peers. In addition to writing your own proposal, you will read and comment upon a proposal written by another student group. Read the proposal and use the guidelines and the form that both are posted on Moodle. Your review should be submitted to me via the Moodle. No paper version is required.

15 %: Homework assignments. Homework consists of answering factual and / or conceptual questions about the reading, raising a question or comment on the assigned reading, or identifying what you experienced to be the most difficult part of the reading (aka muddiest point). Your work should be assigned to me via Moodle **before 8 pm on the night before class (i.e. Sunday/ Wednesday night)**. No paper version is required. Most homework assignments will be discussed in class and will thus enable you to participate in class discussion in a fruitful manner. Failing to hand in an assignment will result in an F score for that particular assignment (= 0 %). After all assignments have been completed, I will leave out your lowest grade of all grades you scored for the various assignments. This means that you are excused from handing in your homework one time without repercussions.

Sometimes we will do in class assignments that will count towards your assignment grade as well. In order to do well, you need to be acquainted with the assigned reading. **See document entitled "assignments" on Moodle for more detailed instructions.**

VII. Course schedule (may be subject to minor changes)

Week	Class	Topics covered	Homework
1	2608	Course instructions Finding literature, Academic integrity Neurotransmission	Read chapter 2, part 2.2 synaptic transmission,
		Psychoactive Drugs Picking a topic for your proposal	Read: Page (crash course Pharmacology, 5th edition), Chapter 1 page 1-13 (on Moodle) Read Kolb 1 (on Moodle)…

			A1 Submit question /comment (deadline 2808 at 8 pm. see assignments file on Moodle)
2	0209	Psychoactive Drugs	Read Kolb 2(on Moodle
		Techniques-brush up Research design	Read Chapter 3 Prepare questions to ask in class (don't send them) **Submit proposal subject and outline** **(see guidelines on Moodle)**
3	0909	Introduction of proposal topics by group 1, 2,3, 4	Presenters: post handout and slides on Moodle Audience: Prepare for talks: Read handout, prepare questions and suggestions (don't send them)
		Introduction of proposal topics by group 5, 6,7, 8	Presenters: post handout and slides on Moodle Audience: Prepare for talks: Read handout, prepare questions and suggestions (don't send them)
4	1609	Hemispheric specialization	Read chapter 4 **A2 Quiz (deadline 1509 midnight)**
		Hemispheric specialization	
5	2309	Attention	Read Chapter 7
		Attention	**All Groups Submit first draft research proposal (via Moodle by 2609 midnight)**
6	3009	Emotion 1: Effects of emotions on perception, attention and memory	Read document Emotions page 345-354 (posted on Moodle) **Read Gazzaniga 10.7** **A3 Submit question /comment via Moodle(deadline 2909 at 8 pm. see assignments file on Moodle)**
		Emotions 2: Effects of emotions on decision making. Emotional regulation	Read document Emotions page 354 – end (posted on Moodle) **Read Gazzaniga 10.6 (especially last part)** **Read Gazzaniga 10.10**
7	0710	Revision time	Q and A session in class (participation is on a voluntary basis)
		MIDTERM	
	14-1810	BREAK	
8	2110	Memory 1 Overview of memory types and amnesia Animal models Encoding and retrieval	Reread chapter 9 **A4 Quiz (focuses on material covered in SCICOGN101)**
		Memory 2: LTP	Read: memory and the brain, how memory works, cellular and molecular level of organization (beginner intermediate and advanced), from website: http://thebrain.mcgill.ca

9	**2810**	Cognitive control 1 Goal directed behavior and decision making	Read Chapter 12.1 to 12.4 (not: section on page 525: "more than one type of decision making")
		Moderation, no class	
10	**0411**	Cognitive control 2 Goal planning and monitoring	Read Chapter 12.5 – end **A5: submit question or comment(deadline 3010 at 8 pm. see assignments file on Moodle)**
		Cognitive control 3 Goal planning and monitoring	**Submit full (draft) version of research proposal. (digital version only) (deadline 0711 at midnight)**
11	**1111**	Social cognition 1	Read chapter 13 Read article on Social cognition by Lopez et al 2018 **A6 Submit question /comment (deadline 1011 at 8 pm. see assignments file on Moodle)**
		Social cognition 2	**Submit review of your peers' proposal (deadline 1411 at midnight)**
12	1811	Sleep	
		Consciousness 1	Read chapter 14 Read : The mystery of consciousness by Steven Pinker (link on Moodle)
13	2511	Consciousness 2	Read: the emergence of consciousness, psychological level of organization (beginner and intermediate) from website: http://thebrain.mcgill.ca **Submit final version of research proposal. (digital version + hard copy) (deadline 2511 at midnight)**
		Ethics in neuroscience	Read : Read: MJ Farah; Neuroethics: the ethical, legal, and societal impact of neuroscience Annu Rev Psychol. 2012; 63:571-91. (posted on Moodle)
14	0212	Revision time Q and A session in class (participation is on a voluntary basis)	
		FINAL EXAM	
15	0912	Presentation of proposal by groups 5-8	Presenters: post handout and slides on Moodle Audience: Prepare for talks: Read handout, prepare questions, suggest improvements (don't email them)
		Presentation of proposal by groups 1-4 Course evaluation	Presenters: post handout and slides on Moodle Audience: Prepare for talks: Read handout, prepare questions, suggest improvements (don't email them

VIII. Student learning outcomes

More detailed objectives (to be used when studying for exam) will be put on Moodle!

Teaching activities	Student is able to do	Period
Refresh the basics of neurotransmission, explain the basics of pharmacology and link these to the workings of psychoactive drugs	Understand these principles and apply them to the workings of a psychoactive drugs not discussed in class	**Week 1 and 2**
Provide feedback on student presentations	Present scientific data, in a well-informed, clear and interactive manner	**Week 3-4**
Discuss and practice with students the reading and analysis of scientific articles, including their strengths, weaknesses and implications	Critically analyze scientific literature within the discipline	**Week 2-14**
Explain to and discuss with students key brain processes underlying memory, emotion hemispheric specialization, attention, consciousness and executive functioning.	Understand, describe and discuss these processes	**Week 1-14**
Relate brain function and dysfunction to behavior	Link the working of the brain to behavioral (dys)function	**Week 1-14**
Discuss the ethical consequences of our increasing knowledge of the brain within respect to drug use, legal responsibility and informing the general public.	Become aware and identify such ethical issues. Be able to form a well-informed opinion on ethical issues within the filed	**Week 13-14**
Discuss and provide step-wise and regular feedback on research proposal. This feedback includes suggestions on how to review literature, what to include in the methods section, and examples of original and feasible proposals.	Be able to review a specific research topic with the discipline. Write a short research proposal that is builds upon current literature and is well planned and feasible.	**Week 2-14**

IX. Appendices

All course materials (except for the book) will be put on Moodle or handed out during class