

3615 Functional Neuroanatomy

Spring 2014

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AH117

Lecture: MWF 1000-1050

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Course Description

A detailed examination of the functional organization of the mammalian brain. Although the majority of the lecture material covered will focus on the human brain, the functional anatomy of other vertebrates will also be examined. Students are expected to have an introductory-level understanding of the brain.

Course Prerequisites

Two 2000-level courses in Neuroscience or Psychology.

Recommended background

Neuroscience 3600

Course Objectives

This course aims to provide you with a basic understanding of how the vertebrate brain is organized. The course begins with an overview of the basic organization of the vertebrate brain, associated vasculature and the peripheral nervous system. The anatomy of several major brain regions will then be examined in further detail followed by the functional organization of the sensory systems. Although the focus will be on the anatomy of the mammalian brain, comparisons will also be drawn with other vertebrates in order to provide a deeper understanding of the anatomy of the brain.

Reading Material

Textbook: Patestas MA, Gartner LP (2006) A Textbook of Neuroanatomy. Blackwell Publishing, New York.

Note that additional readings may be provided on the website for some lectures. These might include scientific papers, newspaper articles or websites.

Recommended or Optional Learning Resources:

The textbook is accompanied by a website that includes figures, animations and answers to quiz questions in the textbook: <http://www.blackwellpublishing.com/patestas/>

The textbook is, however, by no means the only source of information on neuroscience or this course. For extra background information on concepts and examples covered in class, make sure to check out:

Society for Neuroscience (<http://www.sfn.org>)

Some of the teaching resources are useful for studying and their news articles will help you appreciate the breadth of the neuroscience field as well as its importance.

Wikipedia (<http://www.wikipedia.org>)

You are probably familiar with this site already, but it does contain valuable information for reviewing course material.

Brainmaps (<http://www.brainmaps.org>)

An excellent resource for examining the relationship between neuroanatomical structures across a range of species and in different planes of section.

Allen Brain Atlas (<http://www.brain-map.org/>)

Also a good resource for examining brain anatomy in greater detail.

Grading:

Written Assignments	20%
Quizzes	20%
Midterm I	20%
Midterm II	20%
Final Exam	20%

The final exam is not cumulative and will be in class on the last day of classes.

Grading Scheme

A+	> 91	C+	67-69.9
A	85-90.9	C	63-66.9
A-	80-84.9	C-	60-62.9
B+	77-79.9	D+	56-59.9
B	73-76.9	D	50-55.9
B-	70-72.9	F	< 50

Missed Exams: University policy requires a medical certificate that indicates some incapacitating medical illness or condition for students to be excused from missing any exam. Notes from doctors do not automatically grant an excused absence. Given satisfactory documentation, the student will have the weight of their final exam increased to make up for the missed exam. Students missing exams due to a death in the immediate family will be required to provide official documentation. Note, that everyone should expect that later exams will cover more difficult material and will contain fewer easy questions.

Student Responsibilities:

Academic Integrity: All forms of dishonesty are unacceptable at the University of Lethbridge. Cheating, plagiarism and misrepresentation of facts are serious offenses. Anyone who engages in these practices will receive at minimum a grade of zero for the exam or paper in question and no opportunity will be given to replace the grade or redistribute the weights. Any offense will be reported to the Dean of Arts and Science who will determine the disciplinary action to be taken. Typical sanctions for serious violations of the Code have included disciplinary grade reductions, disciplinary failing grades, suspension or permanent expulsion from the university.

Exams: Students are not allowed to have any electronic devices with them during any of the exams. All you will need is a pencil, eraser and at least a modicum of knowledge.

Cell Phones: Cell phones are to be turned off during lectures, labs and seminars. Cell phones are not to be brought to exams (see above).

Students With Disabilities: Students who require accommodation in this course due to a disability are advised to discuss their needs with the Disability Resource Office (SU140, disability.inquiries@uleth.ca).

Disclaimer: Any typographical errors in this Course Outline are subject to change and will be announced in class.

Lecture Schedule¹

Date	Lecture	Topic	Assignment	Reading
8 Jan	1	Introduction		Ch. 1
10 Jan	2	Cell Types and Physiology		Ch. 3
13 Jan	3	Neurotransmitters and Their Receptors		Ch. 4
15 Jan	4	Gross Anatomy		
17 Jan	5	The Spinal Cord		Ch. 5
20 Jan	6	Vasculature	Quiz #1	Ch. 8
22 Jan	7	Meninges and CSF		Ch. 7
24 Jan	8	Autonomic Nervous System		Ch. 9
27 Jan	9	Cranial Nerves		Ch. 15
29 Jan	10	Methods in Neuroanatomy		
31 Jan	11	MRI and CT	Quiz #2	
3 Feb	12	Pons and Medulla		
5 Feb	13	Midbrain I	Assignment #1	
7 Feb			Midterm #1	
10 Feb	14	Midbrain II		
12 Feb	15	Thalamus		Ch. 22
14 Feb	16	Telencephalon		
		READING WEEK		
24 Feb	17	Cerebral Cortex 1		Ch. 23
26 Feb	18	Cerebral Cortex 2		Ch. 23
28 Feb	19	Ascending Pathways	Quiz #3	Ch. 10
3 Mar	20	Somatosensory Structures		Ch. 11
5 Mar	21	Motor Cortex and Descending Pathways		Ch. 11
7 Mar	22	Basal Ganglia		Ch. 12, 14
10 Mar	23	Vocal Learning and Language		TBA ²
12 Mar	24	Cerebellum	Assignment #2, Quiz #4	Ch. 13
14 Mar	25	Vestibular System		Ch. 17,18
17 Mar			Midterm #2	
19 Mar	26	Auditory System		Ch. 17
21 Mar	27	Hypothalamus		Ch. 21
24 Mar	28	Limbic System 1		Ch. 20
26 Mar	29	Limbic System 2		Ch. 20
28 Mar	30	Frontal Cortex	Quiz #5	
31 Mar	31	Eye and Retina		Ch. 16
2 Apr	32	LGN and Visual Cortex		Ch. 16
4 Apr	33	Other Visual Pathways		
7 Apr	34	Olfactory System		Ch. 19
9 Apr	35	Gustatory System	Assignment #3	
11 Apr	36	What makes the human brain different?		
14 Apr			Final Exam	

¹I reserve the right to change the lecture schedule. Any changes made to it will be announced in class and will be posted on Moodle.

²Readings for these lectures will be announced later in class and posted on Moodle.

Additional readings from the internet and the scientific literature may also be made available as assigned readings throughout the semester. These will be made available through Moodle.

Figures used in each lecture and **some** of the text slides will be available before each lecture and posted on Moodle. **Simply downloading the slides will not result in understanding the material and is highly unlikely to result in a good grade.**

Spelling

Spelling anatomical terms correctly is a key part of the material. Spelling will therefore count in all examination questions and assignments throughout the course. Pay heed to this warning now as complaining about it later will only earn you the contempt of your instructors.

Questions About Lecture Material?

Although the instructors are available most of the time, please make an appointment at least 1 day in advance if you have additional questions or concerns, **especially prior to an exam**. Appointments can be made in person, by phone or email, **but do not email questions as they will not be answered**.

Written Assignments

Three (3) written assignments will be assigned throughout the semester. **The assignments are worth a total of 20% of your final grade** and will consist of a clinical case study in which **you** will have to diagnose a patient exhibiting a suite of symptoms. In your diagnosis, you are expected to discuss what brain region(s) is/are likely affected, including a justification, and suggest possible treatment options. The correct answer(s) will be discussed in the class following the assignment deadline. The grading scheme is as follows:

Differential Diagnosis (5 marks)

What is likely responsible for the symptoms?

What brain region or regions are affected?

How do the symptoms relate to the function of the brain regions?

How would you determine that the brain region(s) in question is involved in the symptomology of the patient? (2 marks)

What course of treatment is advised? (2 marks)

Are all terms correctly spelled and your grammar is impeccable? (1 mark)

Failure to score 100% on the assignment does not necessarily mean that your answer is incorrect. Often, one or more symptoms have been ignored or you have not adhered to all of the criteria used in the grading scheme (e.g., yours grammar ain't so good). An example of one of the case studies from previous classes will be made available on Moodle.

To research your assignment, we strongly suggest using that large building that has the books in it and judicious use of the interweb. That is, **DO NOT** rely entirely on Wikipedia or WebMD.

Once graded, the assignments will be returned to you. If you have questions about the grading, please contact one of the instructors to organize an appointment. Note that if you would like your assignment re-graded we **DO NOT** guarantee that your mark will improve or remain as high as it is.

Late assignments will NOT be accepted unless PRIOR arrangements have been made. If you submit an assignment late, you will receive 0.

Quizzes

Five (5) quizzes will be handed out or presented in class promptly at the beginning of the lecture and will last no more than 10 minutes TOTAL. **If you are late, you will NOT be given extra time. Each quiz will be worth 4% of your final grade** and will consist of defining several neuroanatomical terms covered in previous lectures. All quizzes will have the same format: matching of 10-20 anatomical terms with their function or description. They will be graded as soon as possible and handed back to you so that you can contemplate why you should have studied instead of spending most of the night before playing Gears of War, chatting on Facebook and complaining about how difficult your neuroanatomy class is. **All quizzes must be completed in ink.**

Exams

All three exams will include any combination of short answer, multiple choice, matching, crossword puzzles and/or true/false questions. To prepare for the exams, make sure that you attend class, take notes, read the textbook and read any of the additional materials provided (e.g., additional readings, websites, videos, etc.). Also, pay special attention to the summary slide at the end of each lecture as this will highlight what you will need to know.

Midterm 1 – Lectures 1-13

Midterm 2 – Lectures 14-25

Final Exam – Lectures 26-36

FINAL EXAM: 14 April 2014 (the last day of class)

Questions about your grade??

If you have questions about your grade on an assignment, quiz or exam, you must contact the instructor within 7 days of receiving your grade. Beyond the 7 days, you must provide a written request (i.e., hard copy) explaining why you would like your grade re-examined and why you were unable to ask about it at an earlier date.