

Functional Neuroanatomy
Psychology 456
Dr. Virginia Penhune
Fall 2016

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Prerequisites: Psych 358. Open to undergraduate students in Psychology. Open to undergraduate students in related fields by permission of the Department.

Textbook: Fundamentals of Human Neuropsychology, 7th edition. Brian Kolb and Ian Wishaw, Macmillan Publishers

Articles and notes: Available on the Moodle website (Psyc 456/02).

Course Goals:

This course will teach students the fundamentals of human neuroanatomy with a focus on functional systems underlying motor behavior, sensory perception, learning and memory. Special emphasis will be given to understanding how current research uses functional and structural brain imaging techniques to understand the brain, and how information is integrated across systems. We will also address comparisons across species, as well as changes in brain structure and function in neurological disorders.

Topics:

Week1 – Sept 7&12: **Introduction:** CNS organization, gross anatomy, review of cellular organization, tracts and pathways, asymmetry, hierarchy
K&W: Chapters 3 and 10

Week2 – Sept 14&19: **Methods:** neuroanatomical techniques, neurophysiology, neuroimaging, comparative anatomy
K&W: Chapter 7

Week 3 – Sept 21&26: **Sensory systems:** visual, auditory
K&W: Vision: Chaps 8 and 13; Audition: Chaps 8 and 15

Comparative anatomy: “How good is the macaque model of the human brain?”

Weeks 4 and 5 –
Sept 28; Oct 3&5: **Motor and somatosensory systems,** parietal, cerebellum, BG
K&W: Chaps 9&14

Oct 3: **Article 1:** Scholtz et al., 2012. Diffusion tensor imaging (DTI) changes related to juggling

Week 6 – Oct 12: **Midterm**

Weeks 7 and 8 –

Oct 17&19 & 24&26: **Memory systems**
K&W: Chapt 16&18

Oct 24: **Article 2:** Au et al., 2016. Working memory improved by brain stimulation

Weeks 9 and 10 –

Oct 31 & Nov 2

Nov 7 & 9:

Language, proto-language systems, mirror neurons
K&W: Chapt 19

Nov 9: **Article 3:** Berken et al., 2016 Functional connectivity in bilinguals

Nov 7: Research Review due (Article 1 or 2)

Weeks 11 and 12 –

Nov 14&16; 21&23:

Executive control and attention
K&W: Chapt 16 and 22

Weeks 13 and 14 –

Nov 28&30

Dec 5:

Emotion processing
K&W: Chapter 20

Nov 28

Article 4: Salimpour et al, 2010 Music and emotion.

Dec 7: Research Review due (article 3 or 4)

Exam period: Final exam.

Course evaluation:

Midterm (Oct 12th): This in-class test will be multiple choice and essay. It will count for 35 % of the final grade.

Research review: The short paper (5 pages) will be based on one of the research articles presented in class. The review will count for 25% of the final grade. Reviews will be due either on Nov 7th (articles 1 or 2) or Dec 7th (articles 3 or 4).

Final (exam period): Based on the whole course, this test will be multiple choice and essay. It will count for 40 % of the final grade.

Participant Pool credits: up to 3 credits (1.5% of the final grade) will be given

No supplemental exams will be given. No changes to the grading scheme or due dates will be made.

All grades will be reported in letter form in accordance with university regulations. University policy with respect to examinations applies. In particular, students must present evidence of a valid reason (e.g. physician's letter) for missing either the examinations or the research review. Missed exams or other evaluations will result in a mark of zero.

Letter grades are assigned as follows:

A+	91-100	C+	67-70
A	87-90	C	63-66
A-	83-86	C-	60-62
B+	79-82	D+	57-59
B	75-78	D	54-56
B-	71-74	D-	51-53
		F	< 50