

## REQUIREMENTS

<b>Semmelweis University</b> <b>Faculty of Medicine, Department of Anatomy, Histology and Embryology</b>	Faculty, Department:
<b>Name of the course:</b> Systems Neuroscience IV. Neocortex: from structure to function <b>Type of course:</b> optional course-unit <b>code:</b> AOSANT560_4A <b>credit:</b> 2	
<b>Name of the responsible person:</b> Dr. Gábor Gerber (László Négyessy, PhD)	
<b>Academic year:</b> 2018/2019., second semester	
<b>Role of the course in the training of the Department:</b>  What are the characteristics making the brain so special among the organs of the body? Why is the cerebral cortex so important within the brain? Such conceptual questions will be approached from an organizational view of brain's anatomy. The course will then turn on to the exploration of the structure and the functioning of the cerebral cortex as it is known today. It will be shown how the cortex is scaled up from its basic building blocks the neurons interconnected up to the full network of the cortical areas. It will be shown how the functional cortical systems subserving cognition are formed by subnetworks of the areas, and, vice versa, the cortical subnetworks responsible for different cognitive functions will be overviewed.	
<b>The program of the course:</b>  <ol style="list-style-type: none"> <li>1. Lecture: Brain as a unique organ.</li> <li>2. Lecture: Putting cerebral cortex on the map.</li> <li>3. Lecture: Introduction into the science of networks</li> <li>4. Lecture: Cortical networks I</li> <li>5. Lecture: Cortical networks II</li> <li>6. Lecture: Cognitive cortical networks. Sensory and perceptual systems. Low level processing. I</li> <li>7. Lecture: Cognitive cortical networks. Sensory and perceptual systems. Low level processing. II</li> <li>8. Lecture: Cognitive cortical networks. Sensory and perceptual systems. High level processing. I</li> <li>9. Lecture: Cognitive cortical networks. Sensory and perceptual systems. High level processing. II</li> <li>10. Lecture: Cognitive cortical networks. The neurobiology of motor control.</li> <li>11. Lecture: Cognitive cortical networks. Learning and memory. Introduction</li> <li>12. Lecture: Cognitive cortical networks. Episodic memory</li> <li>13. Lecture: Cognitive cortical networks. Procedural memory</li> <li>14. Lecture: Cognitive cortical networks. Working memory</li> <li>15. Lecture: Cognitive cortical networks. Emotional memory</li> <li>16. Lecture: Cognitive cortical networks. Executive functions I</li> <li>17. Lecture: Cognitive cortical networks. Executive functions II</li> <li>18. Lecture: Cognitive cortical networks. Attention</li> <li>19. Lecture: Cognitive cortical networks. Language</li> <li>20. Lecture: Hemispheric lateralization</li> <li>21. Lecture: Students' presentations, discussion I</li> <li>22. Lecture: Students' presentations, discussion II</li> <li>23. Lecture: Students' presentations, discussion III</li> </ol>	

24. Lecture: Written test  
25. Lecture: Written test

**Practical courses:**

1. course: Animal experiment (rodents): surgery, dissecting the brain
2. Course: Animal experiment (rodents): histology
3. Course: Animal experiment (rodents): electrophysiological recording

**Consultations:** personally with the actual course leader

**Requirements of course participation and options to recover missed hours:**

1. Total absence allowed: 10% of the course hours
2. Recovering missing hours: studying the material provided by the course leaders, consultation

**Eligibility:** US grade point average (GPA) of 3.0. Students with a GPA lower than 3.0 should inquire with the Directors on the possibility of a waiver.

**Justification of absence from course hours or exams:**  
Hungarian medical certificate

**Number and schedule of the examinations:**

**1 on the last day of the course**

**Requirements of the successful completion of the program:**

**written or oral test in each course material**

**Marks:**

**In case of a written test grades are given after obtaining points as follows: 0-50% fail, 51-60% pass, 61-75% fair, 76-90% good, above 90% excellent.**

**Types of exam: test, essay, verbal**

**Requirements of the examinations:**

**Verbal and electronic etc. material provided by the lecturers. Syllabus is available upon opening the program on the web page.**

**Registration for exams: NEPTUN**

**Rescheduling the tests:**

**N/A**

**Each student has to take an examination in each block of the course.**

**Justification of absence from the exam:**

**Hungarian medical certificate (see above).**

**List of useful literature (books, papers etc):**

Arbib MA, Érdi P, Szentágothai J (1997) Neural Organization: Structure, Function and Dynamics. MIT Press

Jessell T, Kandel E, Siegelbaum S, Schwartz J, Hudspeth A.J. (2012) Principles of Neural Science. Fifth Edition. McGraw-Hill

Squire L, Berg D, Bloom FE, du Lac S, Ghosh A, Spitzer NC (2012) Fundamental Neuroscience. 4th edition. Academic Press

Gazzaniga MS. (2009) The Cognitive Neurosciences. Fourth edition. The MIT Press

Gazzaniga, M. S., Ivry, R. B. & Mangun, G. R. (2009) *Cognitive Neuroscience: The biology of the mind* (3d ed.). New York: W.W.Norton.

Banich M. T., & Compton, R. J. (2011) Cognitive Neuroscience (3d ed.). Wadsworth Publishing.

Érdi P (2008) Complexity Explained. Springer-Verlag Berlin Heidelberg

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<http://www.scholarpedia.org/article/Encyclopedia:Neuroscience>