REQUIREMENTS

Semmelweis University, Faculty of Medicine
Name of the managing institute (and any contributing institutes):
Department of Anatomy, Histology and Embryology

Name of the subject: Systems Neuroscience II. Neocortex: from structure to function

in English: Systems Neuroscience II. Neocortex: from structure to function

in German:

Credit value: 2

Number of lessons per week: 28 lecture: 0 practical course: 3 seminar: 25

Subject type: compulsory course elective course optional course

Academic year: 2019/2020. academic year II. semester

Subject code: AOSANT560_2A

(In case of a new subject, it is filled by the Dean's Office, after approval)

Name of the course leader: Dr. Gerber Gábor

His/her workplace, phone number: 53653

Position: Vice Chairman of the dept.

Date and registration number of their habilitation: 04/2019

Objectives of the subject, its place in the medical curriculum:
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.

Place where the subject is taught (address of the auditorium, seminar room, etc.):
library room, Department of Anatomy, Histology and Embryology

Successful completion of the subject results in the acquisition of the following competencies:

Course prerequisites:
Anatomy and Physiology. Grade point average (GPA) of 3.0 in the last semester.

Number of students required for the course (minimum, maximum) and method of selecting students:
min. 5, max. 7; on the first-come first-served basis

How to apply for the course:
Neptun

Detailed curriculum:
(Theoretical and practical lessons shall be given separately by numbering the lessons (by weeks).

Please provide the names of the teachers of the lectures and practical lessons and indicate guest lecturers. Do not use attachments!
Always attach a CV for guest lecturers!)

László Négyessy, PhD, guest lecturer
Theoretical lessons

1. Seminar: Brain as a unique organ.
2. Seminar: Putting cerebral cortex on the map.
3. Seminar: Introduction into the science of networks
4. Seminar: Cortical networks I
5. Seminar: Cortical networks II
6. Seminar: Cognitive cortical networks. Sensory and perceptual systems. Low level processing. I
7. Seminar: Cognitive cortical networks. Sensory and perceptual systems. Low level processing. II
8. Seminar: Cognitive cortical networks. Sensory and perceptual systems. High level processing. I
9. Seminar: Cognitive cortical networks. Sensory and perceptual systems. High level processing. II
10. Seminar: Cognitive cortical networks. The neurobiology of motor control.
11. Seminar: Cognitive cortical networks. Learning and memory. Introduction
12. Seminar: Cognitive cortical networks. Episodic memory
13. Seminar: Cognitive cortical networks. Procedural memory
14. Seminar: Cognitive cortical networks. Working memory
15. Seminar: Cognitive cortical networks. Emotional memory
16. Seminar: Cognitive cortical networks. Executive functions I
17. Seminar: Cognitive cortical networks. Executive functions II
18. Seminar: Cognitive cortical networks. Attention
19. Seminar: Cognitive cortical networks. Language
20. Seminar: Hemispheric lateralization
21. Seminar: Students' presentations, discussion I
22. Seminar: Students' presentations, discussion II
23. Seminar: Students' presentations, discussion III
24. Seminar: Written test
25. Seminar: Written test

Practical lessons:

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

Other subjects concerning the border issues of the given subject (both compulsory and optional courses!). Possible overlaps of themes:

Special study work required to successfully complete the course:
(E.g. field exercises, medical case analysis, test preparation, etc.)

Requirements for participation in classes and the possibility to make up for absences:
Total absence allowed: 25% of the course hours
Recovering missing hours: studying the material provided by the course leaders, consultation

Methods to assess knowledge acquisition during term time:
(E.g. homework, reports, mid-term test, end-term test, etc., the possibility of replacement and improvement of test results)
Exam on the last day of the course
Additional occasions to be arranged by the teacher for improvement

Requirements for signature:
Succesful written test

Type of examination:
colloquium

Requirements of the examination:
(*In case of a theoretical examination, please provide the topic list; in case of a practical exam, specify the topics and the method of the exam)*
Verbal and electronic etc. material provided by the lecturers. Syllabus is available upon opening the program on the web page**.**

Method and type of evaluation:
(*Method of calculating the final mark based on the theoretical and practical examination. How the mid-term test results are taken into account in the final mark.)*
Grades are given after obtaining points as follows: 0-50% fail, 51-60% pass, 61-75% fair, 76-90% good, above 90% excellent.

How to register for the examination?:
Neptun

Possibilities for exam retake:
2 occasions arranged by the teacher

Printed, electronic and online notes, textbooks, guides and literature (URL address for online material) to aid the acquisition of the material:

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

Related articles in Scholarpedia:
http://www.scholarpedia.org/article/Encyclopedia:Neuroscience

Signature of the habilitated instructor (course leader) who announced the subject:

Signature of the Director of the Managing Institute:

Hand-in date:

Opinion of the competent committee(s):

Comments of the Dean's Office:

Dean's signature: