GS14 1213: VISUAL NEUROSCIENCE

Course Description: Visual Neuroscience – FALL 2019

Course Directors: Christophe P. Ribelayga and John O'Brien
Lecturers: Christophe P. Ribelayga, John O'Brien, Chai-An Mao, Steven Wang, Ruth Heidelberger, Amir Mohsenin, Stephen C. Massey, David Marshak

Offering: Three semester hours. Fall bi-annually. 30 lecture/exam days – Letter grade

Prerequisite: Instructor's approval.
Attendance < 15 students.
Possibility to audit the course: YES

Class meets on Tuesday and Thursday 10-11 am – MSB-7.037

Spring Semester Academic Classes Begin on August 26th, 2019

Block I - Evolution and general plan of organization of the mammalian visual system (weeks 1-6)

Week 1 (August 26-30)
Tu: Lecture: Light, optics, evolution of the eyes, photoreception and beyond
Th: Article discussion

Week 2 (September 4-6)
Tu: Lecture: Photoreceptors and phototransduction processes
Th: Article discussion

Week 3 (September 9-13)
Tu: Lecture: Excitatory pathways and the division in ON and OFF channels
Th: Article discussion

Week 4 (September 16-20)
Tu: Lecture: Modulatory pathways and development of receptive fields
Th: Article discussion

Week 5 (September 23-27)
Tu: Lecture: Ganglion cells and visual pathways
Th: Article discussion

Week 6 (September 30-October 4)
Tu: Lecture: A specific visual pathway: the non-image-forming visual system
Th: Article discussion

Week 7 (October 7-11)
Tu: REVIEW
Th: Midterm Exam

Block II - Functional retinal circuits (weeks 8-11)

Week 8 (October 14-18)
Tu: Lecture: Spatial resolution, contrast sensitivity
Th: Article discussion

Week 9 (October 21-25)
Tu: Lecture: Color vision, trichromacy, and opponent-color theory
Th: Article discussion

Week 10 (October 28-November 1)
Tu: Lecture: Motion perception
Th: Article discussion

Week 11 (November 4-8)
Tu: Lecture: Principles of adaptation and plasticity of retinal circuits
Th: Article discussion

Block III - Retinal degenerative diseases and visual malfunctions (weeks 12-13)

Week 12 (November 11-15)
Tu: Photoreceptors and retinal degeneration
Th: Article discussion

Week 13 (November 18-22)
Tu: Ganglion cell loss and glaucoma
Th: Article discussion

Week 14 (November 25-29)
THANKSGIVING BREAK---------------------------------------------

Week 15 (December 2-6)
Tu: extra topic
Th: extra topic

Week 16 (December 9-13)
Tu: REVIEW
Th: Final Exam

Last Day of Classes: December 6, 2019; Final Exams: December 9-13, 2019
End of Fall Semester: December 13, 2019