

Course Description: Visual Neuroscience – GS14 1213 – FALL 2020

Course Directors: Christophe P. Ribelayga and John O'Brien

Lecturers: Christophe P. Ribelayga, John O'Brien, Chai-An Mao, Ruth Heidelberger, Stephen C. Massey, David Marshak

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

Pre-requisite: Instructor's approval.

Attendance < 15 students.

Possibility to audit the course: YES

Class meets on Tuesday and Thursday 10-11.30 am – online (WEBEX)

GSBS - Fall Semester Academic Classes Begin on August 31st, 2020

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

Week 1 (September 01-03) (Ribelayga)

Tu: Lecture: Light, optics, evolution of the eyes, photoreception and beyond

Th: Article discussion

Week 2 (September 08-10) (O'Brien)

Tu: Lecture: Photoreceptors and phototransduction processes

Th: Article discussion

Week 3 (September 15-17) (Massey)

Tu: Lecture: Excitatory pathways and the division in ON and OFF channels

Th: Article discussion

Week 4 (September 22-24) (Marshak)

Tu: Lecture: Modulatory pathways and development of receptive fields

Th: Article discussion

Week 5 (September 29-October 01) (Massey)

Tu: Lecture: Ganglion cells and visual pathways

Th: Article discussion

Week 6 (October 06-08) (Ribelayga)

Tu: Lecture: A specific visual pathway: the non-image-forming visual system

Th: Article discussion

Week 7 (October 13-15)

Tu: REVIEW

Th: Midterm Exam

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

Week 8 (October 20-22) (Ribelayga)

Tu: Lecture: Spatial resolution, contrast sensitivity

Th: Article discussion

Week 9 (October 27-29) (O'Brien)

Tu: Lecture: Color vision, trichromacy, and opponent-color theory
Th: Article discussion

Week 10 (November 03-05) (Marshak)

Tu: Lecture: Motion perception
Th: Article discussion

Week 11 (November 10-12) (Ribelayga + O'Brien)

Tu: Lecture: Principles of adaptation and plasticity of retinal circuits
Th: Article discussion

Block III - Retinal degenerative diseases and visual malfunctions (weeks 12-15)

Week 12 (November 17-19) (Ribelayga)

Tu: Photoreceptors and retinal degeneration
Th: Article discussion

Week 13 (November 24-26)

THANKSGIVING BREAK-----

Week 14 (December 01-03) (Mao)

Tu: Ganglion cell loss and glaucoma
Th: Article discussion

Week 15 (December 08-10) (Heidelberger)

Tu: extra topic
Th: extra topic

Week 16 (December 15-17)

Tu: REVIEW
Th: Final Exam

GSBS - Last Day of Classes: December 11, 2020; Final Exams: December 14-18, 2020;
End of Fall Semester: December 18, 2020