Techniques and Approaches in Neuroscience

Icahn School of Medicine at Mount Sinai
Fall 2020, Zoom (class link below), Fridays from 10:30am-12:00pm
Course coordinators: Paul Kenny, PhD and Kirstie Cummings, PhD

Course description: With the accelerated development of new technologies and approaches, research at the cutting-edge of neuroscience is fast-evolving. The purpose of this one credit course is to introduce students to current techniques and methodologies used in research labs in the neuroscience department in order to prepare them for successful rotations in diverse lab settings. All class sessions are led by current postdocs in the Friedman Brain Institute. The course features didactic, discussion, and written components that will facilitate a deep conceptual understanding to enable practical application of popular approaches.

Course format: Each class will be 1.5 hours. The first hour will consist of a didactic component lead by a neuroscience department postdoctoral fellow. The last 30 minutes will serve as a discussion period based on topics covered in the lecture. Readings may be sent out prior to each class in order to prime students for the lecture. Together with weekly written assignments (0.5-1 page), discussion sessions will afford students an opportunity to apply their new knowledge through practice experimental design and data analysis/interpretation. Assignments are due via email to the postdoc lecturer one week after each session (i.e. the following Friday).

Course access: All classes will be conducted via Zoom on the dates indicated from 10:30am-12:00pm. Please use this Zoom link every week: https://mssm.zoom.us/j/94188689746

Course materials: All class materials including lecture slides and associated readings will be uploaded to this Google Drive folder:
https://drive.google.com/drive/folders/1PXZmFnLvqAxN0Njn9LrA20i_gI9sUgxc?usp=sharing

Grading: Grades will be based on participation during the lecture and discussion sections (50%) as well as the written assignments (50%). All students are expected to participate during class. Final grades are Pass/Fail.

Date	Lecture topic	Instructor
09/11/2020	Viral and genetic approaches for circuit dissection	Zoé Christenson Wick, PhD
09/18/2020	Approaches in behavioral neuroscience	Molly Heyer, PhD
09/25/2020	Electrophysiological approaches for probing neuronal, synaptic, and network activities	Lingxuan Chen, PhD
10/02/2020	Molecular biology techniques for studying receptor trafficking and diffusion	Swati Gupta, PhD
10/09/2020	Fundamentals of mechanobiology in controlling pluripotency and neuronal differentiation	Chrystian Alves, PhD
10/16/2020	Optical control of neuronal activity and neural circuits	Romain Durand, PhD
10/23/2020	Tissue clearing and computational analysis of volume imaging data	Alex Smith, PhD
10/30/2020	Imaging neural activity using miniature head-mounted microscopes	William Mau, PhD
11/06/2020	Sequencing techniques for neuroepigenetics	Lorna Farrelly, PhD
11/13/2020	Network: from data to graph	Young Jae Woo, PhD