NSCI 710: Tutorials in Neuroscience

Course Description: Tutorials cover specialized topics in neuroscience in depth in small group setting. Courses consist of directed reading, take-home assignments, tutorials, and discussion. The topic for the 2019 - 2020 academic year is Experimental Design and Biostatistics for Neuroscience.

Credit Hours: 1

Course Prerequisites: Must be a student in good standing in the School of Graduate Studies in the Health Sciences (SGSHS). This course is required for all first year students in the Program in Neuroscience and elective for all other students in the SFSHS.

Course Dates: Spring semester, Mondays, Wednesdays and Fridays, starting on March 4, 2020.

Course Times: MWF, 1:00-3:00pm

Course Location: Neuroscience Institute Large Conference Room (4th fl., TR401)

Instructor: Course Director James Shaffery, D. Phil.
G-111.2, x46684, jshaffery@umc.edu

Faculty Instructors - Faculty in the Graduate Program in Neuroscience.

Required Text and Other Learning Resources: Intuitive Biostatistics, H. Motulsky, 3rd Ed., (2014) New York, Oxford University Press

Course Overview: Experimental Design and Biostatistics for Neuroscience is intended to provide students with advanced understanding of experiment design, the need for rigor and reproducibility in experiments and in data analysis. The course will also provide students with a minimum proficiency in the use of statistical analysis and its execution on the GraphPad software program, which seem to be the most used statistical analysis program among the PIN labs. Students need to purchase a personal copy of the GraphPad program for use on their own laptops. Students will study experimental design and the use of biostatistics in neuroscience, including an examination of the new NIH guidelines for Rigor and Reproducibility in neuroscience under guidance of Faculty in the Program in Neuroscience. The course is presented in seven modules, during seven consecutive weeks, usually Monday, Wednesday

and Fridays, except for the first week when the class will only meet Wed and Fri. Typically, class meetings on Monday will be didactic instruction on statistical test description, including elucidation of the logic for the test along with test assumptions. An example data set is then assigned for Wednesday and the student is expected to complete the assignment and analyze the data in Wednesday's class meeting with assistance from the instructor and/or other students. Fridays are devoted to students independently analyzing an assigned data set unassisted in class (a test) on the GraphPad program. Upon completion of the tests and grading in the class, areas of difficulty will be assessed and addressed in the Friday class meeting.

Course Objectives: Upon completion of this course:

1. Students will have participated in the Society for Neuroscience's online training webinar on Scientific Rigor, "Promoting Awareness and Knowledge to Enhance Scientific Rigor in Neuroscience."

    1) [SfN Seminar 1](#)

    2) [SfN Seminar 2](#)

2. Students will be able to develop neuroscience experiments using appropriate experimental designs.

3. Students will have acquired a basic knowledge of biostatistical analysis methods.
4. Students will be able to apply this basic knowledge to their area of research.

5. Students will become familiar with the use of statistical analysis software, in particular GraphPad Prism, as a tool for data analysis.

Grading Policy and Rubric.

Students are graded based on levels of preparedness prior to each class and levels of participation in each class. In addition, students will be graded each week based on completion of the assigned analysis and tests in class. Course is currently graded Pass/Fail.

Course Policies:

Attendance of the classes is mandatory. Students are expected to read the assigned chapters from the text and any assigned journal articles as well as complete assigned exercises. Unexcused absence will result in a Fail-grade. If students can't attend a session for valid reasons such as illness or conference attendance, the course director needs to be notified prior to the session and a make-up assignment will be discussed and settled upon.

University Policies:

Students with disabilities (ADA) statement: Refer to UMC policy

Academic honesty statement: Refer to UMC policy