FIRST-YEAR STUDENTS

WHAT TO REGISTER FOR in FALL:

BSR1706 "Neuro Core Unit 1: Systems Neuroscience" (Aug-Nov)
BSR1705 "Neuro Core Unit 2: Cellular and Molecular Neuroscience" (Nov-Jan)
BSR1021 "Responsible Conduct in Research"
BSR4702 "Selected Topics in Neuroscience" (our weekly Journal Club/WIP)
BSR5701 "Seminar in Neurobiology" (our weekly *Translational Neuroscience Seminar* series)
BSR2703 "Techniques and Approaches in Neuroscience"
BSR1006 Laboratory Rotation

WHAT TO REGISTER FOR in SPRING:

BSR1707 "Neuro Core Unit 3: Behavioral and Cognitive Neuroscience"
BSR1708 "Neuro Core Unit 4: Pathophysiology of Neurological and Psychiatric Disorders"
BSR6705 "Clinical Topics in Neuroscience" (*direct patient contact)
BSR4702 "Selected Topics in Neuroscience"
BSR5701 "Seminar in Neurobiology (our Translational Neuroscience Seminar series")
BSR1007 Laboratory Rotation
BSR1022 "Rigor and Reproducibility"

BIOSTATISTICS OPTIONS (should be completed in YEAR 1)

There are three options. Regardless of the option that you choose, Biostats should be completed in YEAR 1. Importantly, we do not feel that Option 1 adequately prepares Neuroscience students for rigorous statistical and quantitatively analytical principles needed to succeed in your research. Therefore, we urge students to follow **OPTION 2** or **OPTION 3**.

Option 1 (***NOT*** *recommended*): MPH0300 "Introduction to Biostatistics". This course is taught in the **Fall**. There is no placement test requirement, and no prerequisites. There is a weekly statistical computing lab using SAS. It is too basic and too limited to be useful to Neuroscience students.

Option 2 BIO6400 "Biostatistics for Biomedical Research". This course is taught in the **Fall**. A placement test is required (about 20-25 min long) testing concepts in calculus and algebra, or alternatively, you can provide evidence (your transcript or a Corsera course) that you have had calculus in the past 2-3 years. It is a rigorous biostats preparatory course, with labs in R programming (or SAS, not recommended) that accompany the course. It is a great option if you have a decent-to-strong math background, and will set you up well for "Intro to Data Analysis", a 2nd year advanced course taught by Mark Baxter and Erin Rich (see below).

Option 3 BIO1026 "Applied Biostatistics for Biomedical Research". This is a **SPRING** course; there is no placement test, but prerequisites include a working-level knowledge

of algebra, and familiarity with logarithms and exponents (calculus is helpful, but not required). Additionally--and importantly--students *must* be familiar with programming in R, Python or MATLAB as a prerequisite. If you have programming skills in any of these, you can take BIO1026 directly in the Spring. If you do not, then you can first take either BIO6300 ("Intro to R-Programming) or BMI1007 ("Computer Systems: Intro to Scientific Programming in Python) in the FALL semester. For students picking this 2-course option (an Intro programming course in the Fall, BIO1026 stats in the Spring), we recommend taking BIO6300. The R-programming skills will be directly relevant to "Intro to Data Science" in Year 2, which is R-programming based.

SECOND-YEAR STUDENTS

Minimally 2 Advanced Electives are required. These can be taken from any courses offered across the Institution (but please check any prerequisite).

"Intro to Data Science" (course number not yet assigned). This is a Neuroscience-only advanced course designed to expand students' skills in data exploration and interpretation, utilizing the coding and statistics knowledge acquired in Year 1. Focus will be on large data sets relevant to Neuroscience, including basic analyses of time series data, such as spike trains, imaging data, oscillatory brain data (LFPs, EEG, ECoG); population coding and functional connectivity measures. The course will then emphasize advanced analysis of large neural data sets, covering data mining techniques and best practices, basic classification methods from machine learning, and introducing neural network models and how they scale up to advanced artificial intelligence systems.

BSR4702 "Selected Topics in Neuroscience"
BSR5701 "Seminar in Neurobiology (our Translational Neuroscience Seminar series")
BSR8000 "Independent Research" (before thesis proposal exam)

OR

BSR0000 "Doctoral Dissertation Research (after thesis proposal exam)