

**BIOL490-002**  
**Synaptic Plasticity: Analysis of Primary Literature**  
**Spring, 2020**

**Course Summary:**

Do you want to learn what happens in your brain when you learn something? In this course, we will spotlight one of the molecular events that are fundamental to synaptic plasticity, a key mechanism of learning and memory. We will read a series of scientific papers that elegantly demonstrated it. Students will not only become familiar with this exciting neuroscience topic, but also learn how to interpret experimental data and read papers critically and objectively. We will also think about the future experiments based on the paper we read. This is a **highly interactive course**; it involves a lot of group discussions, in which students are expected to actively participate.

**Instructor:**

Dr. Toshihide Hige  
Email: hige@email.unc.edu  
Office: 3157 Genome Sciences Building  
Office Hours: By appointment

**Time and Location:**

Time: Tuesday and Thursday 2:00pm – 3:15pm  
Location: GSB1377

**Goals:**

Upon completion of the course, students are expected to be able to...

**1. Get excited like a scientist.**

By focusing on one specific topic in neuroscience, students will “witness” how a surprising finding developed into an important concept in neuroscience. Students will share the excitement that must have been felt by the entire field, which is the strongest driving force for the scientists. Which important concept are we dealing with? Well, we will learn what it is as we read the papers, just like the scientists at that time did!

**2. Read like a scientist.**

There is not too much to memorize in this course; the exams are all open notebook, and we will deal with only one topic anyway. The core of the course is to understand the hypotheses, analyze the figures, interpret the data, and critically evaluate the validity of the conclusions. Students are expected to become familiar with the experimental techniques, including electrophysiology.

**3. Think like a scientist.**

Scientists are always thinking about the possible impact of their work and planning on the next experiments. Those are exactly what students will do in this course. After reading the results section, students will formulate their own

discussion points. In the grant panel activity, students will propose potential follow-up experiments and peer-review each other.

**Target Students:**

Undergraduates who are not only strongly excited about neuroscience, but also eager to gain a skill to read primary scientific literatures. Students are also expected to possess basic knowledge in neuroscience.

**Materials:**

There is no required textbook for this course. Primary literatures will be distributed before or within the classes.

**Grading:**

***Attendance and Participation: 25%***

Attendance and active participation during the class period is **essential part** of this course. Participation includes asking and responding to a question, giving respectful and thoughtful comments to the colleagues, and active engagement in both class-wide and small-group discussions.

***Homework: 20%***

Homework will be assigned in most class meetings. Typically, it will be a worksheet or other tasks to facilitate your understanding of the paper. It will be announced at the end of (or shortly after) each class meeting.

***Exams: 15% x 2 (Midterm 1 & 2) + 25% (Final) = 55%***

There will be two midterm exams (**2/18** and **3/26**). Near the end of the course, a new paper, which is closely related to the papers read in the classes, will be assigned. Questions regarding the new paper will be asked in the final exam (**5/4 at noon**). All the exams will be open-notebook, but no electronic devices are allowed.

**Please Note:** The professor reserves the right to make changes to the syllabus, including exam dates (excluding the officially scheduled final examination), when unforeseen circumstances occur. These changes will be announced as early as possible so that students can adjust their schedules.

**Departmental Diversity Statement:**

The Department of Biology values the perspectives of individuals from all backgrounds reflecting the diversity of our students. We broadly define diversity to include race, gender identity, national origin, ethnicity, religion, social class, age, sexual orientation, political background, and physical and learning ability. We strive to make this classroom and this department an inclusive space for all students.

**Honor Code:**

All work done in this class must be carried out within the letter and spirit of the UNC Honor Code. You must sign a pledge on all graded work certifying that no unauthorized

assistance has been given or received. You are expected to maintain the confidentiality of examinations by divulging no information about any examination to a student who has not yet taken that exam. You are also responsible for consulting with your professors if you are unclear about the meaning of plagiarism or about whether any particular act on your part constitutes plagiarism. Please talk with the professor if you have any questions about how the Honor Code pertains to this course.