**USC** Dornsife

**BISC 499, section 13498**

**Developmental and Cellular Neurobiology**

**Units: 2.0**

**Spring 12:00 -1:50 Wednesdays**

**Location:** HNB 100

**Instructor:** Dion Dickman, Ph.D.

**Office**: HNB 309

**Office Hours**: by appointment

**Contact Info**: 213-740-7533, [dickman@usc.edu](mailto:dickman@usc.edu)

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**Course Description**

According to the Merriam-Webster Dictionary, neuroscience is defined as a branch of the life sciences that deals with the anatomy, physiology, biochemistry, or molecular biology of nerves and nervous tissue and especially with their relation to behavior and learning.

**Learning Objectives**

This course is designed to assist you in understanding how individual nerve cells develop, find targets, and establish functional synapses, and how dysfunction in this process contributes to neurological and neuropsychiatric diseases.

**Recommended Preparation**: Bisc 421: Neurobiology core course; Cell Biology

**Required Reading:**

*Principles of Neural Science*. Fifth Edition. Kandel, Schwartz, Jessell, Siegelbaum, Hudspeth.

**Suggested Reading:**

*Development of the Nervous System*. Third Edition. Dan Sanes, Thomas Reh, William Harris.

**Course Material**

Course materials (syllabus, readings, lecture figures, etc.) will be available on Blackboard. <https://blackboard.usc.edu>. Develop the habit of checking Blackboard. Many important announcements will appear first on Blackboard.

**Grading**

The course is divided into two modules with a midterm and final Exam, each for 100 points. Weekly discussions and quizzes will be worth an additional 50 points for the semester.

**Course Schedule: A Weekly Breakdown**

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|  | **Topics/Daily Activities** | **Chapter** | **Pages** |
| Week 1 01.11 | Course overview and Neural Development | 52 | 1165-1171 |
| Week 2 1.18 | Patterning of the nervous system | 52 | 1172-1185 |
| Week 3 1.25 | Differentiation of Nerve cells | 53 | 1187-1199 |
| Week 4 02.01 | Neuronal survival and growth | 53 | 1200-1208 |
| Week 5 02.08 | Axon growth and guidance | 54 | 1209-1231 |
| Week 6 02.15 | **MIDTERM** |  |  |
| Week 7 2.22 | Synaptogenesis I | 55 | 1233-1247 |
| Week 8 03.01 | Synaptogenesis I | 55 | 1248-1257 |
| Week 9 03.08 | Refinement of synaptic connections | 56 | 1259-1282 |
| Spring Break |  |  |  |
| Week 10 03.22 | Transmitter release | 12 | 260-2280 |
| Week 11 03.29 | Modulation of presynaptic release | 12 | 281-287 |
| Week 12 04.05 | Diseases of the nerve and motor units | 14 | 307-330 |
| Week 13 04.12 | Repairing the damaged brain | 57 | 1287-1304 |
| Week 14 04.19 | Seizures and Epilepsy | 50 | 1116-1138 |
| Week 15 04.26 | Sleep, synapses, and dreaming | 51 | 1140-1157 |
| Finals week | **FINAL EXAM**, day/time TBD |  |  |

**Statement on Academic Conduct and Support Systems**

**Academic Conduct**

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences.  Please familiarize yourself with the discussion of plagiarism in *SCampus* in Section 11, *Behavior Violating University Standards*<https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions/>.  Other forms of academic dishonesty are equally unacceptable.  See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct/>.

Discrimination, sexual assault, and harassment are not tolerated by the university.  You are encouraged to report any incidents to the *Office of Equity and Diversity* <http://equity.usc.edu/> or to the *Department of Public Safety* <http://capsnet.usc.edu/department/department-public-safety/online-forms/contact-us>.  This is important for the safety whole USC community.  Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person.  *The Center for Women and Men* <http://www.usc.edu/student-affairs/cwm/> provides 24/7 confidential support, and the sexual assault resource center webpage [sarc@usc.edu](mailto:sarc@usc.edu) describes reporting options and other resources.

## **Support Systems**

A number of USC’s schools provide support for students who need help with scholarly writing.  Check with your advisor or program staff to find out more.  Students whose primary language is not English should check with the *American Language Institute* <http://dornsife.usc.edu/ali>, which sponsors courses and workshops specifically for international graduate students.  *The Office of Disability Services and Programs* <http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html>provides certification for students with disabilities and helps arrange the relevant accommodations.  If an officially  declared emergency makes travel to campus infeasible, *USC Emergency Information* [*http://emergency.usc.edu/*](http://emergency.usc.edu/)will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.