

## Fall 2020 Course Descriptions as of 04/02/2020 08:12 PM

Information in Browse Course Catalog is subject to change. Information is term specific. Please refer to the appropriate term when searching for course content. Key to Course Descriptions may be found at: [http://rcs.registrar.arizona.edu/course\\_descriptions\\_key](http://rcs.registrar.arizona.edu/course_descriptions_key).

### Neuroscience (NROS)

#### **NROS 215: Introduction to Electrophysiology** (3 units)

**Description:** This course will provide sophomores with hands-on laboratory experience in recording electrical signals from living cells. This course is designed to inspire a fascination with brain function.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Flat Fee:** \$50

<b>Course Components:</b>	Discussion	Required
	Laboratory	Required

**Repeatable:** Course can be repeated a maximum of 3 times.

**Course typically offered:**

Main Campus: Spring

**Recommendations and additional information:** Concurrent enrollment in NSCS 200.

**Honors Course:** Honors Contract

**Honors Course:** Honors Contract

#### **NROS 310: Molecular and Cellular Biology of Neurons** (3 - 4 units)

**Description:** Molecular and cellular functions and structures with emphasis on how macromolecules assemble and cooperate to carry out common cellular processes including molecular genetics, movement, signal transduction, organelle assembly & cell division. Focus on the use and interpretation of experimental data using neurons as model cells.

**Grading basis:** Regular Grades

**Career:** Undergraduate

<b>Course Components:</b>	Discussion	May Be Offered
	Lecture	Required

**Equivalent to:** BIOC 410, MCB 410, MIC 410, MICR 410, PLS 410

**Course typically offered:**

Main Campus: Spring

**Recommendations and additional information:** CHEM 151 and 152 with labs; MCB 181R and 181L. Credit allowed for NROS 310 or MCB 410 (BIOC 410, MIC 410, MICR 410, PLS 410) but not both.

**Enrollment requirement:** NSCS 200 required for PRNCND majors.

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**NROS 330: Principles of Neuroanatomy: Cells to Systems** (3 units)

**Description:** This course provides an in-depth exploration of the principles of organization of nervous systems, with a special emphasis on the functional organization of the human brain. Through lectures, in-class discussion of required reading assignments, and class projects, students will learn about the basic anatomical ground-plans of the brains of species ranging from flies to humans and then focus on the details of organization of the sensory and motor systems and neural circuits that control certain complex functions in humans. The cross-species comparisons will highlight fundamental concepts as well as key neuroanatomical specializations that match a particular organism's behavior to its environment.

**Grading basis:** Regular Grades

**Career:** Undergraduate

<b>Course Components:</b>	Discussion	May Be Offered
	Lecture	Required

**Course typically offered:**

Main Campus: Fall

**Enrollment requirement:** NSCS 200 and prerequisite or concurrent enrollment in NROS 307. Other courses may be accepted at the discretion of instructor.

**NROS 381: Animal Brains, Signals, Sex, and Social Behaviors** (3 units)

**Description:** To introduce the relationship between the functional organization of brains and signals in the animal world that elicit brain function resulting in behavior actions. The course will provide students with an appreciation of strategies used to observe, analyze, and study brain organization, relating this to the study of animal behavior, particularly those behaviors involving social and sexual interactions within a species.

**Grading basis:** Regular Grades

**Career:** Undergraduate

<b>Course Components:</b>	Lecture	Required
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**Equivalent to:** ECOL 381, ENTO 381

**Course typically offered:**

Main Campus: Spring

**Recommendations and additional information:** Major or minor in science-related field or, for non-science majors, two courses from Tier One Natural Sciences (courses numbered 170A, B, or C).

**Writing Emphasis:** Writing Emphasis Course

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**NROS 399: Independent Study** (1 - 5 units)

**Description:** Qualified students working on an individual basis with professors who have agreed to supervise such work.

**Grading basis:** Alternative Grading: S, P, F

**Career:** Undergraduate

**Course Components:** Independent Study      Required

**Repeatable:** Course can be repeated a maximum of 99 times.

**Course typically offered:**

Main Campus: Fall, Spring, Summer

**NROS 399H: Honors Independent Study** (1 - 5 units)

**Description:** Qualified students working on individual basis with professors who have agreed to supervise such work.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:** Independent Study      Required

**Repeatable:** Course can be repeated a maximum of 99 times.

**Course typically offered:**

Main Campus: Fall, Spring, Summer

**Enrollment requirement:** Student must be active in the Honors College.

**Honors Course:** Honors Course

**Honors Course:** Honors Course

**NROS 412: Molecular Mechanisms of Learning and Memory** (3 units)

**Description:** The course is designed to provide a solid grounding in mechanisms of learning and memory at the molecular, cellular, behavioral level. After all, learning and remembering are properties of an organism that interacts with its environment and requires molecules and neural circuits that can sense, process, and output information via behavior. Only with insights at all levels can one begin to approach a comprehensive understanding of learning and memory. A combination of lectures and discussions of research papers will comprehensively discuss the current state of knowledge regarding the neurobiological basis of learning and memory derived from invertebrate to mammalian model systems. The course will discuss topics including the biochemical basis of cellular information processing, genes and gene regulation in memory formation, the role of long-term changes in synaptic connections for memory, multimodal signal integration at the molecular level and its role in memory, and biochemical mechanisms of information storage.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:** Lecture      Required

**Course typically offered:**

Main Campus: Fall

**Enrollment requirement:** Students must have completed either NROS 307 or NROS 310.

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**NROS 415: Electrophysiology Laboratory** (3 units)

**Description:** This course will provide seniors with detailed hands-on laboratory experience in recording electrical signals from living cells. This course will cover advanced preparations and data analysis including spike sorting.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Flat Fee:** \$50

**Course Components:**      Discussion                      Required  
   Laboratory                      Required

**Repeatable:** Course can be repeated a maximum of 3 times.

**Course typically offered:**

Main Campus: Spring

**Recommendations and additional information:** NSCS 315 or NROS 310 or NROS 307 or consent of instructor.

**Honors Course:** Honors Contract

**Honors Course:** Honors Contract

**NROS 418: Fundamental Principles in Systems Neuroscience** (3 units)

**Description:** This course approaches the study of neural systems by analyzing and comparing common but critical neurophysiological features that underlie the functioning of various neural systems. We'll use the primary literature, including classical papers, to delve into the nature of these functionalities within the context of specific systems as well brain properties that overlay and coordinate system functions.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:**      Lecture                                      Required

**Course typically offered:**

Main Campus: Spring

**Enrollment requirement:** NROS 307 or PSIO 465. NSCS 315B recommended.

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-CC represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**NROS 430: Neurogenetics** (3 units)

**Description:** Neurogenetics deals with the molecular function of neural genes, their molecular signaling pathways and their relation to neurological disorders. It also provides a powerful methodology to examine molecular and cellular mechanisms of neuronal patterning, migration, connectivity, and all aspects of neuronal function including locomotion, perception, cognition, memory, and behavior. This course teaches genetic approaches to study the nervous system and provides insights into the genetic nature and genetic models of neurological and psychiatric diseases.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:** Lecture Required

**Course typically offered:**

Main Campus: Spring

**Recommendations and additional information:** MCB 181R (required), NROS 310 (recommended).

**NROS 492: Directed Research** (1 - 6 units)

**Description:** Individual or small group research under the guidance of faculty.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:** Independent Study Required

**Repeatable:** Course can be repeated a maximum of 99 times.

**Course typically offered:**

Main Campus: Fall, Spring, Summer

**NROS 499: Independent Study** (1 - 5 units)

**Description:** Qualified students working on an individual basis with professors who have agreed to supervise such work.

**Grading basis:** Alternative Grading: S, P, F

**Career:** Undergraduate

**Course Components:** Independent Study Required

**Repeatable:** Course can be repeated a maximum of 99 times.

**Course typically offered:**

Main Campus: Fall, Spring, Summer

-SA represents a Student Abroad & Student Exchange offering

-CC represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

**NROS 499H: Honors Independent Study** (1 - 5 units)

**Description:** Qualified students working on individual basis with professors who have agreed to supervise such work.

**Grading basis:** Regular Grades

**Career:** Undergraduate

**Course Components:** Independent Study      Required

**Repeatable:** Course can be repeated a maximum of 99 times.

**Course typically offered:**

Main Campus: Fall, Spring, Summer

**Enrollment requirement:** Student must be active in the Honors College.

**Honors Course:** Honors Course

**Honors Course:** Honors Course

**-SA** represents a Student Abroad & Student Exchange offering

**-CC** represents a Correspondence Course offering

**May Be Offered** Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.