

352 / Programs and Courses

NEM 250. Seminar in Nematology (1) Seminar, 1 hour. Prerequisite(s): consent of instructor. Lectures and discussions by visiting scientists, staff and graduate students on topics in nematology. Normally graded Satisfactory (S) or No Credit (NC) only, but students may petition instructor for a letter grade on the basis of presentation of a formal seminar.

NEM 270. Special Topics in Nematology (1) Seminar, 2 hours. Prerequisite(s): consent of instructor. Discussion of current literature within special areas of nematology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

NEM 290. Directed Studies (1-6) Individual studies on specially selected topics in nematology under the direction of a staff member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

NEM 297. Directed Research (1-6) Experimental studies on specially selected topics in nematology under the direction of a staff member. Graded Satisfactory (S) or No Credit (NC).

Neuroscience Undergraduate Major

Subject abbreviation: CBNS

College of Humanities, Arts, and Social Sciences

College of Natural and Agricultural Sciences

Peter Hickmott, Ph.D., Chair
College of Humanities, Arts, and Social Sciences
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College of Natural and Agricultural Sciences
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Committee in Charge

Michael Adams (Cell Biology & Neuroscience, Entomology)
Scott Currie, Ph.D. (Cell Biology & Neuroscience)
Margarita Curras-Collazo (Cell Biology & Neuroscience)
Kelly Huffman (Psychology)
Edward Korzus (Psychology)
Khaleel Razak (Psychology)
B. Glenn Stanley, Ph.D. (Cell Biology & Neuroscience)
Stephen E. Cullenberg, Ph.D.
Dean, College of Humanities, Arts, and Social Sciences, ex officio
Thomas Baldwin, Ph.D.
Dean, College of Natural and Agricultural Sciences, ex officio

Major

The Neuroscience major is an intercollege major offered by the colleges of Humanities, Arts, and Social Sciences and Natural and Agricultural Sciences. It offers upper-division courses that contribute to an academic program emphasizing the functioning of nervous systems at the molecular, cellular, system, behavioral, and cognitive levels. Some of the topics covered include neuroanatomy, neurophysiology, and neurochemistry in humans and other animals; neural mechanisms underlying sensory system function and perception; neural

organization of behavior; development of the nervous system; and neural mechanisms of learning and memory.

Both a B.A. and a B.S. degree are offered by each college. When students declare the major, they choose from which college they wish to have their degree awarded. Students whose degrees are awarded by the College of Humanities, Arts, and Social Sciences are advised in and have their records maintained by the Department of Psychology; students whose degrees are awarded by the College of Natural and Agricultural Sciences are advised in and have their records maintained by the CNAS Academic Advising Center. Breadth requirements vary by college; and students must fulfill the breadth requirements of the college they choose.

For information about student advising, contact the CNAS Academic Advising Center, (951) 827-7294, or the Department of Psychology, (951) 827-5386, University of California, Riverside, Riverside, CA 92521.

University Requirements

See Undergraduate Studies section.

College Requirements

College breadth requirements vary depending on which college is chosen to award the degree. For details on breadth requirements, see the Colleges and Programs section of this catalog. Students are urged to consult their advisor regarding requirements.

The following restrictions and additions apply to college breadth requirements for the Neuroscience major.

For the College of Humanities, Arts, and Social Sciences

Humanities Foreign language at level 4 or above for the B.A. may be used to fulfill up to 8 units of the Humanities breadth requirement.

Social Sciences Psychology courses may not be used as part of the Social Sciences breadth requirement if a Biology course is used to meet any part of the Natural Sciences and Mathematics breadth requirement.

Foreign Language In fulfilling the Foreign Language breadth requirement for both the B.A. and B.S. degrees, a modern language such as Spanish, Russian, Chinese, German, or French must be used.

Natural Sciences and Mathematics

The Neuroscience Core in the Neuroscience major satisfies the Natural Sciences and Mathematics breadth requirement.

For the College of Natural and Agricultural Sciences

Humanities For the B.S. degree, 16 units instead of 12 units are required to fulfill the Humanities breadth requirement. PHIL 134 and PHIL 137 are recommended.

Social Sciences For the B.S. degree, 16 units instead of 12 units are required to fulfill the Social Sciences breadth requirement. Psychology courses not required or approved for the Neuroscience major may be used in meeting the Social Sciences breadth requirement.

Foreign Language In fulfilling the Foreign Language breadth requirement for the B.A. degree, a modern language such as Spanish, Russian, Chinese, German, or French must be used. Further, fourth-quarter level proficiency in one foreign language (not level 2 in two languages) is required.

Natural Sciences and Mathematics The Neuroscience Core in the Neuroscience major satisfies the Natural Sciences and Mathematics breadth requirement.

Major Requirements

- Neuroscience Core (66-72 units; satisfies the Life Sciences Core required for some majors in the College of Natural and Agricultural Sciences). Up to 12 units of upper-division life sciences courses (for this major, courses from the departments of Biochemistry, Biology, Cell Biology and Neuroscience, and Entomology) not being used to satisfy the core may be taken prior to completion of the core; permission from the program chair or the program chair's designate is required to take upper-division units in excess of these 12 units.
 - BIOL 005A, BIOL 05LA, BIOL 005B, BIOL 005C (BIOL 002 and BIOL 003 may be substituted for BIOL 005A, BIOL 05LA, and BIOL 005B with advisor's approval.)
 - PSYC 011 or STAT 040 or STAT 100A
 - MATH 008B or MATH 009A or MATH 09HA, MATH 009B or MATH 09HB
 - CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC (or CHEM 01HA and CHEM 1HLA, CHEM 01HB and CHEM 1HLB, CHEM 01HC and CHEM 1HLC); CHEM 112A, CHEM 112B, CHEM 112C
 - PHYS 002A, PHYS 002B, PHYS 002C, PHYS 02LA, PHYS 02LB, PHYS 02LC; or PHYS 040A, PHYS 040B, PHYS 040C
 - BCH 100 or BCH 110A
- Upper-division requirements
 - First Tier (14 units)
 - CBNS 106
 - CBNS 120/PSYC 120
 - CBNS 120L/PSYC 120L
 - CBNS 124/PSYC 124
 - Second Tier (at least 12 units for the B.A. or at least 20 units for the B.S.)

BIOL 178; CBNS 101, CBNS 116, CBNS 121/PSYC 121, CBNS 123, CBNS 125/PSYC 125, CBNS 126/PSYC 126, CBNS 127/PSYC 127; PSYC 129, PSYC 136

c) Third Tier (additional units to reach a total of 36 units for the B.A. or 52 units for the B.S.)

Select from upper-division courses listed under Neuroscience Core, Second Tier above not used to satisfy those requirements, and the additional courses listed below. The combined number of units taken under First Tier, Second Tier, and Third Tier must total either 36 if the B.A. is sought or 52 if the B.S. is sought.

BCH 102, BCH 110B, BCH 110C, BCH 120; BIOL 100/ENTM 100, BIOL 102, BIOL 105, BIOL 107A, BIOL 108, BIOL 109, BIOL 110, BIOL 151, BIOL 160, BIOL 161A, BIOL 161B; BIOL 162/ENTM 162; BIOL 171, BIOL 171L, BIOL 173/ENTM 173, BIOL 175, BIOL 185P; CBNS 169; up to 9 units from CBNS 191, CBNS 194, CBNS 197 and/or CBNS 199; CS 170; PHYS 139L; PSYC 132, PSYC 134, PSYC 135, ANTH 146/PSYC 146

Note No courses other than those listed may be used in the major unless specifically approved by the program chair or the program chair's designate.

Sample Program

Bachelor of Arts

Freshman Year	Fall	Winter	Spring
CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC	4,1	4,1	4,1
BIOL 005A, BIOL 05LA; BIOL 005B		3,1	4
ENGL 001A, ENGL 001B, ENGL 001C	4	4	4
MATH 008B or MATH 009A, MATH 009B	4	4	
Humanities/Social Sciences			4
Total Units	13	17	17
Sophomore Year	Fall	Winter	Spring
CHEM 112A, CHEM 112B, CHEM 112C	4	4	4
BIOL 005C	4		
CBNS 106	4		
PSYC 001, PSYC 002		4	4
General Physics	4	4	4
General Physics Lab	1	1	1
Foreign Language	1, 2	4	4
Total Units	17	17	17
Junior Year	Fall	Winter	Spring
BCH 100 or BCH 110A	4		
PSYC 011	5		
Upper-division BIOL, CBNS, or PSYC	4	8	8
Foreign Language	3, 4	4	4
Humanities/Social Sciences		4	4
Total Units	17	16	12
Senior Year	Fall	Winter	Spring
Upper-division BIOL, CBNS, or PSYC	4	4	4
Humanities/Social Sciences	8	4	4
Electives	4	8	8
Total Units	16	16	16

Bachelor of Science

Freshman Year	Fall	Winter	Spring
CHEM 001A, CHEM 001B, CHEM 001C, CHEM 01LA, CHEM 01LB, CHEM 01LC	4,1	4,1	4,1
MATH 008B or MATH 009A, MATH 009B	4	4	
BIOL 005A, BIOL 05LA; BIOL 005B		3,1	4
ENGL 001A, ENGL 001B, ENGL 001C	4	4	4
Humanities/Social Sciences			4
Total Units	13	17	17
Sophomore Year	Fall	Winter	Spring
CHEM 112A, CHEM 112B, CHEM 112C	4	4	4
BIOL 005C	4		
CBNS 106	4		
PSYC 001, PSYC 002		4	4
General Physics	4	4	4
General Physics Lab	1	1	1
Humanities/Social Sciences		4	4
Total Units	17	17	17
Junior Year	Fall	Winter	Spring
BCH 100 or BCH 110A	4		
PSYC 011	5		
Upper-division BIOL, CBNS, or PSYC	4	8	8
Humanities/Social Sciences	4	8	4
Total Units	17	16	12
Senior Year	Fall	Winter	Spring
Upper-division BIOL, CBNS, or PSYC	12	8	8
Electives	4	8	8
Total Units	16	16	16

Minor

A minor in Neuroscience is available. For more information on minor requirements, refer to the discussion of minors in the appropriate college section of the General Catalog.

1. First tier (14 units)
 - a) CBNS 106
 - b) CBNS 120/PSYC 120
 - c) CBNS 120L/PSYC 120L
 - d) CBNS 124/PSYC 124

2. Second Tier (6 units)

Select additional units from the list below so that the units from the First Tier combined with the units from the Second Tier equal at least 20.

BIOL 178; CBNS 101, CBNS 116, CBNS 121/PSYC 121, CBNS 125/PSYC 125, CBNS 126/PSYC 126, CBNS 127/PSYC 127; PSYC 129

Descriptions for all courses used in the Neuroscience major and minor may be found in the appropriate department section.

Neuroscience Graduate Program

Subject abbreviation: NRSC
College of Natural and Agricultural Sciences

Michael E. Adams, Ph.D., Director
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neuro.ucr.edu

Professors

Michael E. Adams, Ph.D.
(Cell Biology and Neuroscience/Entomology)
John Andersen, Ph.D. (Psychology)
Nancy E. Beckage, Ph.D.
(Entomology/Cell Biology and Neuroscience)
Curt Burgess, Ph.D. (Psychology)
Christine Chiarello, Ph.D. (Psychology)
Manuela Martins-Green, Ph.D.
(Cell Biology and Neuroscience)
Thomas H. Morton, Ph.D. (Chemistry)
B. Glenn Stanley, Ph.D.
(Cell Biology and Neuroscience/Psychology)
Raphael Zidovetzki, Ph.D.
(Cell Biology and Neuroscience)

Associate Professors

Maxim Bazhenov, Ph.D., (Cell Biology and Neuroscience)
Monica J. Carson, Ph.D. (Biomedical Sciences)
Margarita C. Currás-Collazo, Ph.D.
(Cell Biology and Neuroscience)
Scott N. Currie, Ph.D.
(Cell Biology and Neuroscience)
Iryna M. Ethell, Ph.D. (Biomedical Sciences)
Peter W. Hickmott, Ph.D. (Psychology)

Assistant Professors

Douglas L. Altshuler, Ph.D. (Biology)
Anupama Dahanukar, Ph.D. (Entomology)
Douglas W. Ethell, Ph.D. (Biomedical Sciences)
Todd Fiacco, Ph.D. (Cell Biology and Neuroscience)
Kelly J. Huffman, Ph.D. (Psychology)
Edward Korzus, Ph.D. (Psychology)
Anandasankar Ray, Ph.D. (Entomology)
Khaleel Razak, Ph.D. (Psychology)
Wendy G. Saltzman, Ph.D. (Biology)
Aaron Seitz, Ph.D. (Psychology)
Emma Wilson, Ph.D. (Biomedical Sciences)

Graduate Program

The multidisciplinary interdepartmental graduate program in Neuroscience offers instruction and research training leading to the Ph.D. degree in Neuroscience. The M.S. degree (Plan I, Thesis) is available in special circumstances when the work leading to the Ph.D. degree cannot be completed.

The goal of this program is to prepare students for careers in research, teaching and scientific administration. The program is aimed at providing high-quality graduate training for students who come from a variety of undergraduate backgrounds but share a commitment and an intense interest in nervous system research. Students are expected to learn the fundamentals of neuroscience, starting with a required core sequence, become knowledgeable concerning a range of research methods as taught in neuroscience laboratories and demonstrate capability in original