career options and goals in the sciences, opportunities for undergraduate research, development of learning and study skills, ethics in research and education, and an introduction to the faculty in CNAS.

**NASC 092. First-Year Seminar in the Natural and Agricultural Sciences (1)** Seminar, 10-15 hours per quarter. Prerequisite(s): Freshman standing. Enrollment priority is given to freshmen, but sophomores may enroll on a space-available basis with consent of instructor. Introduction to one of the many areas of study explored by the faculty of natural and agricultural sciences in a small-group, highly interactive format. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

**NASC 093. Freshman Advising Seminar in the Natural and Agricultural Sciences (2)** Seminar, 1 hour; discussion, 1 hour. Prerequisite(s): first-year freshman standing in the College of Natural and Agricultural Sciences (CNAS). Introduction to UCR for students in the sciences. Includes selection of majors, curriculum planning, career options and goals in the sciences, opportunities for undergraduate research, development of learning and study skills, ethics in research and education, and an introduction to the faculty and professional academic advisors in CNAS. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of BCH 095, NASC 091, or NASC 093.

### Upper-Division Courses

**NASC 191S. Seminar in Sacramento (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor; admission to the UCR Center at Sacramento Program. Examines aspects of the Sacramento area, including cultural, political, and governmental institutions and the sciences, arts, and media. Requires a substantial research paper or project, the result of guided independent work drawing on the unique aspects of Sacramento. Required of participants in the UCR Center at Sacramento Program. Cross-listed with ENGR 191S and HASS 191S.

**NASC 191W. Seminar in Washington, D.C. (4)** Seminar, 3 hours; outside research, 3 hours. Prerequisite(s): upper-division standing or consent of instructor; admission to the UCR Washington Center Program. Examines aspects of the Washington, D.C., area, including cultural, political, and governmental institutions as well as the sciences, arts, and media. Requires a substantial research paper or project, the result of guided independent work drawing on the unique aspects of Washington, D.C. Required of participants in the UCR Washington, D.C., Center Program. Cross-listed with ENGR 191W and HASS 191W.

**NASC 192. Careers in Science and Mathematics Education (1)** Seminar, 1 hour. Prerequisite(s): upper-division standing or consent of instructor; consent of instructor is required for students repeating the course. Covers preparation for a career in mathematics and science teaching. Includes job search strategies. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 2 units.

**NASC 198-L. Individual Internship in the Natural and Agricultural Sciences (1-12)** Internship, 2-24 hours; written work, 1-12 hours. Prerequisite(s): upper-division standing in the College of Natural and Agricultural Sciences (CNAS); consent of instructor. An internship to provide CNAS students with on-the-job experience in government, industry, or clinical laboratories. Each individual project must be approved by the CNAS associate dean and the laboratory director where the internship is to be carried out. Requires a written report. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

### Nematology

**Subject abbreviation:** NEM

**Course**: College of Natural and Agricultural Sciences

**Professor**: James G. Baldwin, Ph.D., Chair

**Department Office**: 2317 Webber Hall

**UCR website**: www.nematology.ucr.edu

**Prerequisite(s)**:

- Upper-division standing or consent of instructor. Research in nematology with the guidance of the supervising faculty member.
- A written report is required. Course is repeatable.

**NEM 100. Special Studies (1-4)** Individual study, 1-4 hours. Prerequisite(s): consent of instructor and Department Chair. Individual study, directed by a faculty member, to meet special curricular needs. A written report is required. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**NEM 197. Research for Undergraduates (1-4)** Laboratory, 1-12 hours. Prerequisite(s): upper-division standing. Research in nematology with the guidance of a Nematology faculty member. A written report is required. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**NEM 199. Senior Research (2-4)** F, W, S Laboratory, 6-12 hours. Prerequisite(s): senior standing, a grade of “B+” or better in an upper-division Nematology course; or consent of instructor. Individual research on a problem relating to Nematology. A written proposal signed by the supervising faculty member must be approved by the major advisor and the department chair and a written report filed with the supervising faculty member. Course is repeatable to a maximum of 9 units.

### Graduate Courses

**NEM 205. Identification of Plant Parasitic Nematodes** (Summer) (one week only) Lecture, 5 hours; laboratory, 25 hours. Prerequisite(s): upper-division standing or consent of instructor. Five-day lecture and laboratory course on morphological identification of economically important plant parasitic nematodes in...
**Neuroscience Undergraduate Major**

Subject abbreviation: CBNS

**College of Humanities, Arts, and Social Sciences**

- Peter Hickmott, Ph.D., Chair
  - College of Humanities, Arts, and Social Sciences
  - 1113 Olmsted Hall; (951) 827-7308
- College of Natural and Agricultural Sciences
  - 1223 Pierce Hall; (951) 827-4186
  - neuromajor.ucr.edu

**Committee in Charge**
- Curt Burgess, Ph.D. (Psychology)
- Christine Chiarello, Ph.D. (Psychology)
- Scott Currie, Ph.D. (Cell Biol & Neuroscience)
- Glenn Hatton, Ph.D. (Cell Biol & Neuroscience)
- Peter Hickmott, Ph.D. (Psychology)
- B. Glenn Stanley, Ph.D. (Cell Biol & Neuroscience)
- Raphael Zidovetzki, Ph.D. (Neuroscience/Biology)
- Stephen E. Cullenberg, Ph.D.
  - Dean, College of Humanities, Arts, and Social Sciences, ex officio
- Steven R. Angle, 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) 827-7309, 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**
  - Foreign language at level 4 or above for the B.A. must be used to fulfill the Humanities breadth requirement.
- **Social Sciences**
  - For the B.S. degree, 16 units instead of 12 units are required to fulfill 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.

**Major Requirements**

1. Neuroscience Core (66-72 units; satisfies the Life Sciences Core required for some majors in the College of Natural and Agricultural Sciences).
   - 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.
   - a) BIOL 005A, BIOL 05LA, BIOL 05LB, BIOL 005C (BIOL 002 and BIOL 003 may be substituted for BIOL 005A, BIOL 05LA, and BIOL 005B with advisor’s approval.)
   - b) PSYC 011 or STAT 040 or STAT 100A
   - c) MATH 009B or MATH 009A or MATH 09HA, MATH 009B or MATH 09HB
   - d) 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 12A, CHEM 112B, CHEM 112C
   - e) PHYS 002A, PHYS 002B, PHYS 002C, PHYS 02LA, PHYS 02LB, PHYS 02LC; or PHYS 040A, PHYS 040B, PHYS 040C
   - f) BCH 100 or BCH 110A

2. Upper-division requirements
   - a) First Tier (14 units)
     - (1) CBNS 106
     - (2) CBNS 120/PSYC 120
     - (3) CBNS 120L/PSYC 120L
     - (4) CBNS 124/PSYC 124

Tylenchida and Dorylaimida using dissecting and bright field microscopy. Includes preparation of microscope slides, diagnosis of field samples, and use of diagnostic keys. Offered in summer only. Baldwin

NEM 206. Phytopathogens: Nematodes (2) S Lecture, 1 hour; laboratory, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Recognition, diagnosis, biology, and control of major nematode diseases of plants. Laboratory covers identification techniques, soil sampling and processing techniques, and process of pathogenesis. Cross-listed with PLPA 206. Roberts

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) Individual studies on specially selected topics in nematology under the direction of a staff member. Graded Satisfactory (S) or No Credit (NC).