The neuroscience degree offers students an intense introduction to the study of the nervous system. While the core faculties reside in the Department of Psychology and Neuroscience, faculty in other departments from the College of Arts and Sciences also contribute to the interdisciplinary education. Students will study the cellular and molecular properties of single nerve cells, the connections among them and learn how these properties determine animal behavior. Advanced coursework will dissect more specialized topics within the broad field of neuroscience to address specific student interests.

Find additional information regarding the Neuroscience major at our website:

http://psych.colorado.edu/~nrsc/

ADVISING FOR THE NEUROSCIENCE MAJOR

All undergraduate advising for sophomores through graduation for the Neuroscience major (NRSC), including Core Curriculum and other Arts and Sciences requirements, is done in the Department. Each new sophomore through senior Neuroscience student is assigned to a NRSC advisor:

Carrie Bagli: carrie.bagli@colorado.edu (303) 492-9914
Kelli McAntee: kelli.mcantee@colorado.edu (303) 492-0862
Kristina Porter: kristina.porter@colorado.edu (303) 492-8241
Gwen Robeson: gwen.robeson@colorado.edu (303) 492-5118
Scott Zeman: scott.zeman@colorado.edu (303) 735-2748

Advising office front desk: (303) 492-1234
Advising office website: http://psych.colorado.edu/~advising/
Advising office blog: http://cuneuroadvising.wordpress.com/

To schedule an advising appointment: http://www.colorado.edu/advising/

REQUIREMENTS FOR THE NEUROSCIENCE MAJOR

Overview

The NRSC undergraduate major leads to a Bachelor of Arts (B.A.) degree in Neuroscience from the College of Arts and Sciences (A&S). Diploma will read “Bachelor of Arts in Neuroscience.” Students majoring in NRSC must satisfy NRSC major and ancillary requirements as well as A&S requirements.

- See detailed description in University Catalog.
- PSYC & NRSC course descriptions are available in the online University Catalog: http://www.colorado.edu/catalog/ See the “Courses” tab.
Course Details: Ancillaries

All courses must be completed with a grade of C- or better. Ancillary courses do not count toward major hours or major GPA.

1. **MCDB 1150 with 1151 or 1161 or 1171 Introduction to Cell and Molecular Biology with lab, 4 credit hours (Typically Fall, sometimes Spring-lecture only)**

   or **EBIO 1210 with 1230 General Biology I with lab, 4 credits (Typically Fall & Summer only, sometimes Spring thru Continuing Ed)**

   - CHEN 2810 (or equivalent transfer credit), or appropriate scores on the International Baccalaureate or Advanced Placement exams may be used to satisfy this requirement. Students who take CHEN 2810 must also take an approved lab requirement.
   - We strongly urge each student to discuss these options with the NRSC advisor. A&S recognizes MCDB 1150/1151 as sufficiently different from EBIO 1210/1230 so that no credit is lost by also taking MCDB 1150/1151 if a student has AP or IB credit for EBIO 1210/1230. If considering pre-health, consult with pre-health advisor on whether AP scores would be accepted.

2. **MATH 1300, Calculus and Analytical Geometry I, 5 credit hours (Fall, Spring, Summer)**

   - MATH 1310, Calculus, Systems, and Modeling or APPM 1350, Engineering Calculus I are acceptable alternatives.
   - All of the calculus courses require prerequisite course of MATH 1150 or APPM 1235 (minimum grade D-) or an ALEKS math score of 76% or greater. Students with weak backgrounds should first take MATH 1150 (this will be an elective). **Do not take MATH 1071 & 1081, which are courses for business and social science students.**

3. **CHEM 1113 with 1114 and 1133 with 1134 General Chemistry I and II with labs, 10 credit hours (Fall, Spring, Summer)**

   Students with no high school chemistry or a weak background in chemistry should take CHEM 1021, Introductory Chemistry, before attempting General Chemistry (this will be an elective).

   - Students transferring from Engineering may substitute CHEN 1211 and CHEM 1221 for CHEM 1113/1114, but must take CHEM 1133 & 1134.

4. **CHEM 3311, Organic Chemistry I, 4 credit hours (Fall, Spring, Summer)**

   - Prerequisite for CHEM 3311: A grade of C- or better in General Chemistry II & lab.
   - CHEM 3351 and 3361, Organic Chemistry I and Lab for Majors are recommended for BCHM double majors. Students planning graduate school, medical school, or work in the biotechnology industry should plan to take CHEM 3321, Organic Chemistry I lab and CHEM 3331 and CHEM 3341, Organic Chemistry II and Lab or another recommended upper division CHEM course. Please consult your program of interest and your pre-health advisor for specific requirements.

Course Details: Major Courses

5. **NRSC 2100: Introduction to Neuroscience, 4 credit hours (Fall, Spring, sometimes Summer)**

   - EBIO 1210 or MCDB 1150 is the pre-requisite.
   - Recommended to take this course sophomore year

6. **NRSC 2200: Laboratory Techniques in Neuroscience, 2 credit hours (Fall, Spring)**

   - NRSC 2100 is the pre-requisite.
   - Recommended to take this course sophomore year

7. **MCDB 2150 with 2151 or 2161 or 2171 Principles of Genetics with lab, 4 credit hours (Fall and Spring, sometimes Summer)**

   - MCDB 1150 or equivalent is the prerequisite.
   - EBIO 2070, Genetics: Molecules to Populations is also an approved genetics course, however MCDB genetics is recommended as better preparation for MCDB 3135 (see below). EBIO 2070 has recommended pre-reqs of EBIO 1210, 1220, 1230, and 1240 with grades of C- or higher and is typically taught spring and summer, though sometimes fall.

8. **Choose one statistics course from the list of accepted statistics courses, 3 or 4 credit hours (Fall, Spring, Summer)**

   - Be cautious to select a course for which you meet the pre-requisites and restrictions.
   - Most common selection is MATH 2510 or PSYC 2111. PSYC 2111 is a pre-requisite for some of the upper division major electives (see below). Pre-requisite for PSYC 2111 is College Algebra (MATH 1011) or more advanced math (pre-calc, etc). PSYC double majors must opt for PSYC 2111. Prior to Fall 2015, PSYC 2111 was PSYC 3101. It will still count toward the statistics requirement for NRSC under either number.

9. **MCDB 3135, Molecular Cell Biology I, 3 credit hours (Typically Fall; sometimes Spring, Summer)**

   - MCDB 2150 or other approved genetics course and CHEM 1113 & 1114 are the pre-requisites. See course description.
10. Neuroscience Core Courses: complete at least three of the following:

**NRSC 4032, Neurobiology of Learning and Memory, 3 credit hours (Typically Fall, Spring, Summer)**
- Prerequisite: PSYC 2012 or 4052, or IPHY 3730, or NRSC 2100 or 4052

**NRSC 4052, Behavioral Neuroscience, 4 credit hours (Typically Fall). Same course as PSYC 4052**
- Prerequisite: with a C- or higher: NRSC 2100 or PSYC 2012 and one of these sequences: EBI 1210-1220 or CHEM 1113-1133 or PHYS 1010-1020 or PHYS 1010-2010. PSYC double majors can use this course as the PSYC Lab & Methods course.

**NRSC 4072, Clinical Neuroscience, 3 credit hours (Typically Fall)**
- Prerequisite: PSYC/NRSC 4052 or PSYC 2012 or NRSC 2100 and one of the following sequences: EBI 1210-1220, MCDB 1150-2150, or MCDB 1150-EBIO 1220, or EBI 1210-MCDB 2150 (all C- or higher)

**NRSC 4082, Neural Circuits of Learning and Decision Making, 3 credit hours (Typically Spring)**
- Prerequisite: NRSC 2100 or PSYC/NRSC 4052 (C- or higher)

**NRSC 4092, Behavioral Neuroendocrinology, 3 credit hours (Typically Spring)**
- Prerequisite: PSYC 2012 or NRSC 2100 (C- or higher)

**NRSC 4132, Neuropharmacology, 3 credit hours (Typically Fall)**
- Prerequisite: PSYC 2012 or NRSC 2100 and CHEM 1133 (all C- or higher)

11. NRSC Elective Courses

NRSC majors must also complete a minimum of 9 credit hours of upper-division electives from the approved list.

- **Elective Courses:** At least one of the upper division elective courses (3 hours) must be from the approved list of PSYC or NRSC prefixed courses. Taking additional courses from requirement #10 will count toward the 9 elective hours.
- There is no upper limit on NRSC electives, but A&S requires students to complete at least 75 credit hours outside their major department. Any course which satisfies requirements 5 through 10 will count toward the 9 elective hours.
- **Independent study:** Thesis credit (NRSC 4011) may be counted toward the 9 hours of major electives, however Independent Study (PSYC/NRSC 4841) cannot count toward the major requirements (since it is mandatorily graded pass/fail). PSYC/NRSC 4841 can count toward general upper division elective hours (toward the graduation requirement of 45 hours of upper division) and counts toward the 45 department hours.
- **Electives from other departments:** A maximum of six credit hours from an approved list of out-of-department electives may be used as upper division Neuroscience electives. Current approved list is available on purple requirement sheet or the degree audit.

**SAMPLE DEGREE PLAN**

There are many ways to fit all the Departmental and College graduation requirements into a four-year degree plan. We encourage each student to develop a personalized degree plan in consultation with the departmental advisor. The following notations and assumptions are incorporated in the plan:

- MATH 1300, MATH 1310 or APPM 1350 is used for QRMS.
- The required writing courses are designated “LD writing” lower division and “UD writing” upper division.
- This plan assumes MAPS (including foreign language) are complete. Lower division electives may need to be used toward MAPS as applicable per individual.
- “NRSC Elective” refers to an upper division NRSC or General Science elective approved for the major. At least 1 course must be prefixed upper division NRSC or PSYC (from list). No more than 6 credit hours may be approved out-of-department courses.
- “*” indicates categories in which there is more than one option to satisfy the major requirement. Please refer to requirement sheet or degree audit for a list of options.

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- **NRSC 4132, Neuropharmacology, 3 credit hours (Typically Fall)**
  - Prerequisite: PSYC 2012 or NRSC 2100 and CHEM 1133 (all C- or higher)
RESEARCH OPPORTUNITIES FOR UNDERGRADUATES

Research plays a major role in the overall program of NRSC. Many of the faculty are recognized leaders in their specialties, and the Department is rated among the best research departments in its field. Opportunities are available for undergraduate research experience and the Department actively encourages students to participate in its research activities.

Most research projects begin in the sophomore or junior years and continue until graduation. Individual faculty members differ in the amount of classroom experience they expect before accepting a student for independent study.

Students can receive course credit for Independent Study research (this credit counts toward upper division electives, not toward the 30 hours required for the NRSC major), and a successful project combined with a 3.3 GPA can lead to graduation with Honors. There are also work-study and part-time paid positions in many laboratories.

The University also has Bioscience Undergraduate Research Skills and Training Program (BURST) and Undergraduate Research Opportunities Program (UROP) to encourage development of joint student-faculty research projects and to help with their costs. Details are available online at: http://bsi.colorado.edu/ and http://www.colorado.edu/suep/urop/apply

GETTING INVOLVED IN RESEARCH

Students must first identify and contact a faculty member who is willing to serve as a sponsor. PSYC and NRSC faculty and their research interests are available at: http://www.colorado.edu/psych-neuro/staff/faculty or http://www.colorado.edu/psych-neuro/research/faculty-research-labs

After the student and faculty sponsor have agreed on a project, they must complete and sign an independent study contract if the student would like to earn university credit. The Independent Study Form is available from the PSYC & NRSC Undergraduate Advising office (MUEN D-243) or online at http://psych.colorado.edu/~advising/current-undergrads.html. The signed contract should be submitted for approval before the end of the first week of classes. Registration must be completed by the end of the drop/add period for the semester in which the research will be done.

EARNING DEPARTMENTAL HONORS

Graduating with Latin honors is possible only by writing and defending an honors thesis. To find out more information, meet with your advisor after reading the following website: http://www.colorado.edu/psych-neuro/undergraduates/honors-program

PREREQUISITES

Prerequisites for PSYC and NRSC courses are described in terms of CU course numbers. Equivalent transfer credits are generally acceptable. Potentially qualified students who lack the formal prerequisites for a PSYC or NRSC course must obtain consent from the instructor before enrolling. Students lacking the prerequisites for a course may be administratively dropped. All students are encouraged to take prerequisites very seriously and to learn about pre-requisites through course descriptions many semesters ahead of time.

APPLYING TRANSFER CREDIT TOWARD MAJOR REQUIREMENTS

Any transfer course a student wishes to have apply toward the major must be approved by the faculty. Use https://www.transferology.com/ to verify exact equivalency and the Transfer Credit Pre-Approval process found here: http://www.colorado.edu/artsandsciencestransfer/

CU-BOULDER NEUROSCIENCE CLUB

Connect with the faculty and students of the Neuroscience community. Find them under “CU Boulder Neuroscience Club” on Facebook, or at: http://www.colorado.edu/StudentGroups/neuroscience/ or to be added to their mailing list, send an email to neuroscienceclub@colorado.edu

NEUROSCIENCE LISTSERV

Find out about opportunities in the greater Front Range Neuroscience community (seminars, conferences, etc) by signing up for the Neuroscience seminars listserv. Send an email to Dr. Serge Campeau at serge.campeau@colorado.edu. In the subject line say “SUBSCRIBE NEUROSCIENCE SEMINAR LISTSERV” Let him know you are an undergraduate Neuroscience student and would like to be added to the NRSC seminar listserv.
**NEUROSCIENCE Planning Sheet (January 2014 and forward declare date)**

**TOTAL HOURS/120 REMAINING to graduate:** _______ (after FA/SP/SU ‘___)

**Total Upper Division hours/45 REMAINING (from your major or from anything else) to graduate:** ____________

**CORE REQUIREMENTS REMAINING** (usually 3 credits each except for foreign language or math courses): Foreign Language, Written Communication Lower Division, Written Communication Upper Division, Historical Context, Human Diversity, US Context, Literature & Arts Lower Division, Literature & Arts Upper Division, Contemporary Societies, Ideals & Values (QRMS and Natural Science are covered by NRSC requirements) Other: ______________

**NRSC requirements REMAINING:** Biology 1 + lab, Calculus 1, Gen. Chem 1 + lab, Gen. Chem 2 + lab, O Chem I, NRSC 2100, NRSC 2200, genetics, statistics, Cell Bio I- MCDB 3135, NRSC Core #1, NRSC Core #2, NRSC Core #3 (3 of the following: NRSC 4032, 4052, 4072, 4082, 4092, 4132) 9 hr NRSC electives (see list in audit): ______________, ____________, ____________, (max 6 hr outside PSYC/NRSC)

**Requirements for graduate school or pre-professional school Remaining:** ____________________________

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