The University of Texas at Dallas
Online Catalog

2006-2008 Undergraduate Catalog

Introduction (home)
Contents / Site Map
Admissions
Academic Policies and Procedures
Registration
Resources for Study and Campus Life
Tuition and Fees
Financial Aid
Degree Programs
Undergraduate Programs
Course Descriptions
Academic Calendar
Administration
Board of Regents
Faculty
Correspondence Directory
Appendices
Alphabetical Index

Search the 2006-2008 UG catalog:
go

UTD Home Page
Online Catalogs Index
Graduate Catalog

DOWNLOADS

Neuroscience (B.S.)

Neuroscience is the multidisciplinary study of brain function that draws on recent advances in computer science, biology, chemistry, physics, and cognitive science. It examines the brain's global biochemistry, the subcellular processes of its individual cellular components, its complex and extensively networked anatomical structure, and its remarkably adaptive physiology. The field considers neuronal development from early embryology through advanced senescence, and examines the brain's adaptive processes at the level of single neurons, through networks and systems of cells, on up to complete organisms. It studies the regulation and expression of behavior, and the complex interactions of multiple neuronal systems that underlie the emergence of cognitive function. The Neuroscience program at U. T. Dallas provides students with the opportunity to focus on the brain from a systems-level perspective, drawing on the behavioral and cognitive perspectives of psychology and the cellular and molecular perspectives of biology. It allows undergraduates extensive interactions with working neuroscientists who use the latest analytic techniques.

The Neuroscience program is designed to prepare students for admission to graduate or medical school, or for careers in related biomedical research, medicine, dentistry, and other health science specialties. Required courses and guided electives can include the approved pre-medical curriculum and offer an alternative to other traditional pre-medical majors. Students who wish to continue their education in the fields of medicine, dentistry or allied professional areas should register with the Health Professions Advisory Committee during their first semester. Students are encouraged to design a personalized degree plan of guided electives with their advisor that will combine courses from the related disciplines of mathematics, physics, chemistry, biology, engineering, computer science, psychology, and speech pathology and audiology in a way that will suit their individual interests and goals.

Students can complete Core Curriculum and Neuroscience major requirements in a minimum of 85 semester credit hours, leaving 35 elective hours. Students can complete Core Curriculum, Neuroscience major, and Pre-health Professions requirements in a minimum of 111 semester credit hours, leaving 9 remaining elective hours.

Bachelor of Science in Neuroscience Degree Requirements (120 hours)

I. Core Curriculum Requirements[1]: 42 hours

A. Communication (6 hours)
- 3 hours Communication (RHET 1302)
- 3 hours Communication Elective (NSC 4353)[2]

B. Social and Behavioral Sciences (15 hours)
- 6 hours Government (GOVT 2301 and 2302)
- 6 hours American History
- 3 hours Social and Behavioral Science Elective (PSY 2301)[2]

C. Humanities and Fine Arts (6 hours)
- 3 hours Fine Arts (ARTS 1301)
- 3 hours Humanities (HUMA 1301)

D. Mathematics and Quantitative Reasoning (6 hours)
- 3 hrs College Math (MATH 2417)[2]
- 3 hrs Quantitative Methods (PSY 2317 or STAT 1342)[2]

E. Science (9 hours)
- 9 hrs Science (CHEM 1311 and CHEM 1111, BIOL 2311 and BIOL 2281)[2]

[1] Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at U.T. Dallas.

II. Major Requirements: 64 hours (43 hours beyond Core Curriculum)

Major Preparatory Courses: 24 hours

All of the following:

BIOL 2281 Introductory Biology Lab[2] (also satisfies 3 hours part E of Core Curriculum)

BIOL 2311/2111 Introduction to Modern Biology[2] with Workshop

CHEM 1311/1111 General Chemistry I w/ Lab[2] (also satisfies 3

BEHAVIORAL AND BRAIN SCIENCES

General Information
Child Learning and Development
Cognitive Science
Neuroscience
Psychology
Speech-Language Pathology and Audiology

hours part E of Core Curriculum)

CHEM 1312/1112 General Chemistry II w/ lab

MATH 2417 Calculus I[2] (also satisfies 3 hours part D of Core Curriculum)

PSY 2301 Introduction to Psychology[2] (also satisfies 3 hours part B of Core Curriculum)

PSY 2317 Statistics for Psychology[2]

or STAT 1342 Statistical Decision Making[2] (also satisfies 3 hours part D of Core Curriculum)

Major Core Courses: 25 hours

All of the following:

NSC 3361 Behavioral Neuroscience
NSC 4166 Neuroanatomy Workshop
NSC 4352 Cellular Neuroscience

NSC 4353 Neuroscience Laboratory Methods[2] (also satisfies 3 hours part A of Core Curriculum)

NSC 4354 Integrative Neuroscience
NSC 4356 Neurophysiology
NSC 4363 Neuropharmacology
NSC 4366 Neuroanatomy
NSC 4367 Developmental Neurobiology

Major Related Courses: 15 hours (15 hours beyond the Core Curriculum)

Advanced Guided Electives: 15 semester hours from the following. Consultation with an advisor is required.

BIOL 3361 Biochemistry I
BIOL 3362 Biochemistry II
CGS 4312 Computational Models of Language Understanding
NSC 3344 Anatomy and Physiology of Speech and Hearing
NSC 3345 Neural Basis of Communication
NSC 4355 Advanced Neuroscience Laboratory
NSC 4357 Brain and Memory
NSC 4358 Neuroscience of Sensation and Perception
NSC 4368 Computational Neuroscience
NSC 4370 Neuroendocrinology
NSC 4372 Neuroimmunology
NSC 4373 Sensory Neurophysiology
NSC 4374 Neural Plasticity in Neuropathologies
NSC 4375 Honors Seminar
NSC 4376 Stress and the Nervous System
NSC 4394 Internship in Neuroscience
NSC 4397 Honors Thesis
NSC 4V98 Directed Research[3]
NSC 4V99 Individual Study[4]
NSC 4V90 Special Topics in Neuroscience
PSY 4360 Learning
PSY 4362 Perception
SPAU 3304 Communication Sciences

[2] A required Major course that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.

[3]May be repeated for credit, up to 9 hours.

[4]May be repeated for credit, up to 6 hours.

III. Elective Requirements: 35 hours

Advanced Electives (6 hours)

Breadth Electives; 6 hours of upper-division courses, or lower-division courses that have prerequisites that are outside of Neuroscience.

Free Electives (29 hours)

At least 30 hours of lower- or upper-division courses of the student's choice. Students are encouraged to explore areas of concentration in Neuroscience as well as explore interests outside the field. Be aware that at least 51 hours of upper-division credit hours are required for graduation.

Premedical and/or other pre-health professions students: 27 hours

Students seeking to complete Pre-health Professions requirements

should take the following as free electives:

Required pre-medical courses (12 hours):

- BIOL 2112 Introduction to Modern Biology Workshop II
- BIOL 2312 Introduction to Modern Biology II
- CHEM 2123 Introductory Organic Chemistry Laboratory I
- CHEM 2125 Introductory Organic Chemistry Laboratory II
- CHEM 2323 Introductory Organic Chemistry I
- CHEM 2325 Introductory Organic Chemistry II

Pre-med Advanced Biology requirement (6 hours, select 2 courses):

- BIOL 3301 Classic and Molecular Genetics
- BIOL 3302 Eukaryotic Molecular and Cell Biology
- BIOL 3361 Biochemistry I
- BIOL 3362 Biochemistry II

Pre-med Physics requirement (8 hours, select 2 courses):

- PHYS 1101 College Physics Laboratory I *
- PHYS 1301 College Physics I *
- PHYS 1102 College Physics Laboratory II *
- PHYS 1302 College Physics II *
- PHYS 2125 Physics for Bioscience Laboratory I **
- PHYS 3341 Physics for Bioscience I **
- PHYS 2126 Physics for Bioscience Laboratory II **
- PHYS 3342 Physics for Bioscience II **

** algebra based Physics courses*
*** calculus based Physics courses*

Minor in Neuroscience

Students who are not majoring in Neuroscience may minor in Neuroscience by taking 18 semester credit hours selected from the lists of major core courses and major related courses. At least 12 hours must be upper-division Neuroscience core courses. No credit hours may be used to satisfy both major and minor requirements; however, free elective hours or major preparatory classes may be used to satisfy the minor. At least one-third of the hours for a minor must be taken at U.T. Dallas.

Fast Track Baccalaureate/Master's Degrees

U.T. Dallas undergraduate students with strong academic records who intend to pursue a master's degree in Applied Cognition and Neuroscience at UTD may consider an accelerated undergraduate-graduate plan of study. When accepted into the program, students may take up to 12 hours of graduate courses that may be used to complete the baccalaureate degree and also satisfy requirements for the master's degree. Students must maintain a 3.00 grade point average and earn grades of B or better in graduate courses taken. The Fast Track makes it possible for students to complete upper-division undergraduate education and graduate training in three years, including summer study. To qualify for application, students must have completed at least 72 semester credit hours toward their bachelor degree, including at least 18 semester credit hours in major core courses at UTD. Apply to the Fast Track program through the Applied Cognition and Neuroscience Program Office. Students should consult with a graduate advisor regarding admissions criteria and plans of study.

The University of Texas at Dallas 2006-2008 Undergraduate Catalog
Volume 31, Number 1