COMPUTING & NEUROTECHNOLOGY CONCENTRATION

Neuroscience, Bachelor of Science with a Concentration in Computing and Neurotechnology Requirements

Code	Title	Credits
GENERAL EDUCATION REQUIREMENTS - 34 Hours Required		
Minimum of "C-"required		
Fundamental Skills		**15**
Writing – 6 hrs.		
ENGL 1150	ENGLISH COMPOSITION I	
ENGL 1160	COLLEGE RESEARCH AND INFORMATION LITERACY	
Oral Communication – 3 hrs.		
CMST 1110	PUBLIC SPEAKING FUNDS	
or CMST 2120	ARGUMENTATION AND DEBATE	
Quantitative Literacy – 3 hrs.		
MATH 1120	INTRODUCTION TO MATHEMATICAL AND COMPUTATIONAL THINKING	
or MATH 1130	QUANTITATIVE LITERACY	
or MATH 1140	QUANTITATIVE REASONING FOR HEALTHCARE PROFESSIONALS	
or MATH 1300	COLLEGE ALGEBRA WITH SUPPORT	
Data Literacy – 3 hrs.		
Select one from the following:		
STAT 1100	DATA LITERACY AND VISUALIZATION	
STAT 1530	ELEMENTARY STATISTICS	
Until Fall 2028, students can satisfy this requirement with an approved data literacy course, or any approved natural or social science general education course.		
Breadth of Knowledge		**13**
Social Science – 3 hrs.		
Humanities – 3 hrs.		
Natural & Physical Science (must complete a lab) – 4 hrs.		
Arts – 3 hrs.		
Individual and Social Responsibility		**6**
Cultural Knowledge – 3 hrs.		
Civic Knowledge and Engagement – 3 hrs.		
MAJOR REQUIREMENTS		
**Course will satisfy UNO's General Education requirement		
^Course requires pre-requisite(s)		
Neuroscience Major - 53-57 Hours Required		
Required Neuroscience Fundamentals Courses (Core)		**20-23**
NEUR 1000	SUPERHEROES, ZOMBIES, CYBORGS AND DROIDS: COULD THEY LIVE AMONG US? (**^)	
or BIOL 1450	BIOLOGY I	
NEUR 1520	INTRODUCTION TO NEUROSCIENCE I (^)	
NEUR 1540	INTRODUCTION TO NEUROSCIENCE II (^)	
PSYC 3130	STATISTICS FOR THE BEHAVIORAL SCIENCES (^)	
or STAT 3000	STATISTICAL METHODS I	
NEUR 3600	RESEARCH METHODS IN NEUROSCIENCE (^)	
or PSYC 3140	RESEARCH METHODS IN PSYCHOLOGY	
Select one of the following:		
CHEM 1140 & CHEM 1144	FUNDAMENTALS OF COLLEGE CHEMISTRY and FUNDAMENTALS OF COLLEGE CHEMISTRY LABORATORY (** ^)	
or		
PHYS 1110 & PHYS 1154	PHYSICS FOR LIFE SCIENCE I and GENERAL PHYSICS LABORATORY I (** ^)	
or both		
CHEM 1180 & CHEM 1184	GENERAL CHEMISTRY I and GENERAL CHEMISTRY I LABORATORY (** ^)	
and		
CHEM 1190 & CHEM 1194	GENERAL CHEMISTRY II and GENERAL CHEMISTRY II LABORATORY (^)	
Required Courses		**6**
***indicates also a Computing Path course**		
CIST 1600	INTRODUCTION TO PROGRAMMING USING PRACTICAL SCRIPTING (^, *, SUB HCC 8006 FOR FAST TRACK)	
or CIST 1400	INTRODUCTION TO COMPUTER SCIENCE I	
BIOI 1000	DIGITAL HEALTH AND BIOLOGICAL SYSTEMS (** (*) Sub HCC 8006 for Fast Track)	
Select 2 from the following courses (At least one from ACMP or BIOI)		**6**
ACMP 1100	INTRODUCTION TO INFORMATION SECURITY (**)	
ACMP 1200	HUMAN-CENTERED COMPUTING (**)	
ACMP 2900	SPECIAL TOPICS IN APPLIED COMPUTING AND INFORMATICS	
ACMP 3200	DATA STRUCTURES AND ALGORITHMS FOR APPLIED COMPUTING AND INFORMATICS (^)	
ACMP 3220	CREATIVITY AND INNOVATION	
ACMP 3330	DESIGN METHODS AND PROTOTYPING (^)	
ACMP 4000	SPECIAL TOPICS IN IT INNOVATION	
ACMP/CSCI 4260	USER EXPERIENCE DESIGN (SUB HCC/ CSCI 8266 FOR FAST TRACK STUDENTS)	
BIOI 3000	APPLIED BIOINFORMATICS (^,*)	
BIOI 4890	COMPUTERIZED GENETIC SEQUENCE ANALYSIS (SUB BIOI 8896 FOR FAST TRACK STUDENTS)	
NEUR 4000	SYSTEMS NEUROSCIENCE (^)	
NEUR 4160	NEUROPHARMACOLOGY (^)	
NEUR 4330	SOCIAL NEUROSCIENCE (^)	
NEUR 4340	ADVANCED BEHAVIORAL NEUROSCIENCE (^)	
NEUR 4480	NEUROIMMUNOLOGY (^)	
NEUR 4840	GLIA IN HEALTH AND DISEASE (^)	
NEUR 4870	MOLECULAR AND CELLULAR NEUROBIOLOGY (^)	

Other courses in NEUR, BIOI or ACMP approved by advisor. Students who have applied for the Fast Track Programs may take graduate versions of these courses. Nine credit hours of graduate-level coursework may count toward the Neuroscience Major for students in the Fast Track Program of study.

In addition to the required fundamentals courses, 18-19 credit hours as a combination from the Cornerstone Neuroscience Lecture (3 credits), Laboratory (3 – 4 credits), and Block I, Block II, and Block III Courses (12 credits) from the lists below must be selected. Within the 12-hour credit selection, at least 3 credits must come from Block I and at least 3 credits must come from Block II. To complete the 18 credits required, a minimum of 6 credits can be taken from a combination of Block I, Block II, and Block III. No more than three hours of Experiential Study in Neuroscience (NEUR 4960) may be applied to the Additional Advanced Neuroscience Courses category. NEUR 4910, NEUR 4920, and NEUR 4930 may be taken more than once as long as they are different topics. No courses can double-count within this 18-credit hour group.

Advanced Neuroscience Coursework (18-19)

In addition to completing the required fundamentals courses, students must select 18–19 credit hours from the following components:

Cornerstone Neuroscience Lecture **3**

Select one of the following lecture courses, unless it has already been used to satisfy the Supporting Neuroscience Block Courses requirement:

NEUR 4000	SYSTEMS NEUROSCIENCE (^)
NEUR 4160	NEUROPHARMACOLOGY (^)
NEUR 4330	SOCIAL NEUROSCIENCE (^)
NEUR 4480	NEUROIMMUNOLOGY (^)
NEUR/BIOL 4870	MOLECULAR AND CELLULAR NEUROBIOLOGY (^)
NEUR/BIOL 4890	GENES, BRAIN, AND BEHAVIOR (^)
PSYC/BIOL 4320	HORMONES & BEHAVIOR (^)

Cornerstone Neuroscience Laboratory **3-4**

NEUR 4200	ADVANCED NEUROSCIENCE LABORATORY
NEUR/BIOL 4810	BEHAVIORAL GENETICS
PSYC/BIOL 4280	ANIMAL BEHAVIOR LABORATORY

Block I, II, and III Courses **12**

Complete 12 credits total across Blocks I, II, and III, according to these rules:

At least one course (3 credits) must be from Block I (Molecular and/or Cellular Neuroscience)

At least one course (3 credits) must be from Block II (Behavioral and/or Cognitive Neuroscience)

The remaining credits (6 or more) may be selected from any combination of Blocks I, II, or III to reach the 12-credit total.

Block I (Molecular and/or Cellular Neuroscience)

NEUR 4000	SYSTEMS NEUROSCIENCE (^)
NEUR 4160	NEUROPHARMACOLOGY (^)
NEUR 4290	NEUROETHOLOGY (^)
NEUR 4340	ADVANCED BEHAVIORAL NEUROSCIENCE (^)
NEUR 4480	NEUROIMMUNOLOGY (^)
NEUR 4640	NEURAL MECHANISMS OF SUBSTANCE USE DISORDERS (^)
NEUR 4840	GLIA IN HEALTH AND DISEASE (^)
NEUR 4850	NEUROBIOLOGY OF LEARNING AND MEMORY (^)
NEUR 4870	MOLECULAR AND CELLULAR NEUROBIOLOGY (^)
NEUR/BIOL 4890	GENES, BRAIN, AND BEHAVIOR (^)
NEUR 4910	SPECIAL TOPICS IN NEUROSCIENCE - BLOCK 1 (^)

Block II (Behavioral and/or Cognitive Neuroscience)

NEUR/BIOL/GERO 3500	BIOLOGICAL PRINCIPLES OF AGING (^)
NEUR/GERO 4050	ADVANCED BIOLOGY OF AGING
NEUR/PSYC 4230	BEHAVIORAL NEUROSCIENCE (^)
NEUR 4330	SOCIAL NEUROSCIENCE (^)
NEUR 4650	NEUROMECHANICS OF HUMAN MOVEMENT (^)
or BMCH 4650	NEUROMECHANICS OF HUMAN MOVEMENT
NEUR 4710	AI IN HEALTHCARE AND NEUROSCIENCE (^)
NEUR 4920	SPECIAL TOPICS IN NEUROSCIENCE - BLOCK 2 (^)
PSYC 4090	COGNITIVE NEUROSCIENCE (^)
PSYC 4210	SENSATION AND PERCEPTION (^)
PSYC/PHIL 4250	LIMITS OF CONSCIOUSNESS (^)
PSYC/BIOL 4270	ANIMAL BEHAVIOR (^)
PSYC/BIOL 4320	HORMONES & BEHAVIOR (^)

Block III (Additional Advanced Neuroscience Choices)

NEUR 4930	SPECIAL TOPICS IN NEUROSCIENCE - NEURO ELECTIVE BLOCK (^)
NEUR 4960	EXPERIENTIAL STUDY IN NEUROSCIENCE (^)

Important Notes:

No more than 3 credits of NEUR 4960 (Experiential Study in Neuroscience) may count toward these 18–19 credits.

NEUR 4910, NEUR 4920, and NEUR 4930 may be repeated for credit provided the topics are different.

Courses cannot be "double-counted" within this set of 18–19 credits (i.e., each course may only fulfill one requirement in this category).

College Breadth **0**

Neuroscience majors satisfy College of Arts and Sciences' Option 3 for college breadth, a CAS interdisciplinary major.

Bachelor Science Cognate Requirement **15**

Students must complete 15 credits worth of a cognate set of courses (see below) OR may choose a minor of at least 15 hours or a double major. Courses taken within the major may not also be used toward the completion of cognate coursework. Six (6) hours of cognate coursework may double-count with your Gen Ed requirements. No more than 6 hours of cognate coursework may be at the 1000 level. At least 3 hours of cognate coursework must be at the 3000-4000 level. Note that some classes have prerequisites.

ANTH 1050	INTRODUCTION TO ANTHROPOLOGY (**)
ANTH 3910	INTRODUCTION TO PHYSICAL ANTHROPOLOGY (** ^)
ANTH 4230	ETHNOMEDICINES OF THE AMERICAS (^)
ANTH 4240	MEDICAL ANTHROPOLOGY
BIOI 1000	DIGITAL HEALTH AND BIOLOGICAL SYSTEMS (**)
BIOL 2740	HUMAN ANATOMY AND PHYSIOLOGY I (^)

BIOL 2840	HUMAN ANATOMY AND PHYSIOLOGY II (^)
BIOL 3020	MOLECULAR BIOLOGY OF THE CELL (^)
BIOL 3240	INTRODUCTION TO IMMUNOLOGY (^)
BIOL 4110	STATISTICS FOR BIOLOGICAL SCIENCES (^)
BIOL 4130	MOLECULAR GENETICS (^)
BIOL 4140	CELLULAR BIOLOGY (^)
BIOL 4230	EVOLUTION (^)
BIOL 4260	BEHAVIORAL ECOLOGY (^)
BIOL 4650 & BIOL 4654	BIOCHEMISTRY I and BIOCHEMISTRY I LABORATORY (^)
BIOL 4730	VERTEBRATE ENDOCRINOLOGY (^)
BIOL 4740	ANIMAL PHYSIOLOGY (^)
BIOL 4850	DEVELOPMENTAL BIOLOGY (^)
BIOL 4860	COMPARATIVE GENOMICS (^)
BIOL 4960	ADVANCED GENETICS (^)
BMCH 2400	HUMAN PHYSIOLOGY & ANATOMY I (**)
BMCH 2500	HUMAN PHYSIOLOGY AND ANATOMY II (^)
BMCH 4100	BIOINSPIRED ROBOTICS
CHEM 3650 & CHEM 3654	FUNDAMENTALS OF BIOCHEMISTRY and FUNDAMENTALS OF BIOCHEMISTRY LABORATORY (^)
CHEM 4610	BIOCHEMISTRY OF METABOLISM (^)
CHEM 4650 & CHEM 4654	BIOCHEMISTRY I and BIOCHEMISTRY I LABORATORY (^)
CSCI 1200 & CSCI 1204	COMPUTER SCIENCE PRINCIPLES and COMPUTER SCIENCE PRINCIPLES LABORATORY (** ^)
ENVN 4320	ECOLOGICAL SUSTAINABILITY AND HUMAN HEALTH (^)
MATH 1940	CALCULUS FOR BIOMEDICINE (^)
PHIL 2020	INTRODUCTION TO PHILOSOPHY OF MIND
PHIL 3650	PHILOSOPHY OF MIND (^)
PHIL 4220	NEUROETHICS (^)
PHYS 3300	INTRODUCTION TO BIOMEDICAL PHYSICS (^)
PHYS 3500	ELEMENTS OF ELECTRONICS (^)
PHYS 4500	BIOLOGICAL PHYSICS (^)
PSYC 1010	INTRODUCTION TO PSYCHOLOGY I (**)
PSYC 1020	INTRODUCTION TO PSYCHOLOGY II (^)
PSYC 2024	EXPLORATIONS IN THE SCIENCE OF PSYCHOLOGY (^)
PSYC 3520	CHILD PSYCHOLOGY (^)
PSYC 4020	LEARNING (^)
PSYC 4024	LABORATORY IN PSYCHOLOGY: LEARNING (^)
PSYC 4234	LABORATORY IN PSYCHOLOGY: BEHAVIORAL NEUROSCIENCE (^)
PSYC 4440	ABNORMAL PSYCHOLOGY (^)
PSYC 4460	PSYCHOLOGY OF ADULT DEVELOPMENT AND AGING (^)
PSYC 4470	MENTAL HEALTH AND AGING (^)
PSYC 4990	SENIOR THESIS (^)
ELECTIVES	
Elective hours as required to reach a total of 120 hours	