

**College of Science**  
**Bachelor of Science in Neuroscience**  
**For Students Graduating in 2021**  
**Major: Cognitive and Behavioral Neuroscience**

**1. Curriculum for Liberal Education (CLE) Requirements (36 Credits)**

|         |  |               |  |
|---------|--|---------------|--|
| Area 1: | Writing and Discourse                        | _____ (3) ( ) | _____ (3) ( )  |
| Area 2: | Ideas, Cultural Traditions and Values        | _____ (3) ( ) | _____ (3) ( )  |
| Area 3: | Society and Human Behavior                   | _____ (3) ( ) | _____ (3) ( )  |
| Area 4: | Scientific Reasoning and Discovery           |               |  |
|         | BIOL 1105 Principles of Biology <sup>1</sup> | (3) ( )       | BIOL 1106 Principles of Biology <sup>1</sup> (3) ( )       |
| Area 5: | Quantitative and Symbolic Reasoning          |               |  |
|         | MATH 1025 Elementary Calculus <sup>1</sup>   | (3) ( )       | MATH 1026 Elementary Calculus <sup>1</sup> (3) ( )         |
| Area 6: | Creative and Aesthetic Experience            | _____ (3) ( ) | Area 7: Critical Issues in Global Context<br>_____ (3) ( ) |

**2. Core Neuroscience Requirements (21 Credits)**

|                              |                                  |         |         |
|------------------------------|----------------------------------|---------|---------|
| CHEM 1035-1036 <sup>1</sup>  | General Chemistry                | (3) ( ) | (3) ( ) |
| NEUR 1004 <sup>1</sup>       | Neuroscience Orientation Seminar |         | (1) ( ) |
| #NEUR 2025-2026 <sup>1</sup> | Introduction to Neuroscience     | (3) ( ) | (3) ( ) |
| NEUR 2035-2036 <sup>1</sup>  | Neuroscience Laboratory          | (1) ( ) | (1) ( ) |
| #NEUR 4044 <sup>1</sup>      | Neuroscience Senior Seminar      |         | (3) ( ) |
| PSYC 1004 <sup>1*</sup>      | Introductory Psychology          |         | (3) ( ) |

\*note that because PSYC1004 is in the "Core" requirements, it *may not* double count as an area 3 course

**3. Cognitive and Behavioral Neuroscience Major Requirements (23 Credits)**

|                            |  |         |         |
|----------------------------|--|---------|---------|
| BIOL1115-1116 <sup>1</sup> | Principles of Biol. Lab                              | (1) ( ) | (1) ( ) |
| #NEUR 3084                 | Cognitive Neuroscience                               |         | (3) ( ) |
| #NEUR 3144                 | Mechanisms of Learning and Memory                    |         | (3) ( ) |
| #PSYC 1094                 | Principles of Psychological Research                 |         | (3) ( ) |
| #PSYC 2044                 | Psychology of Learning                               |         | (3) ( ) |
| #STAT3615-STAT 3616        | Biological Statistics                                | (3) ( ) | (3) ( ) |
| CHOOSE 1:                  |  |         |         |
| #NEUR 3914                 | Neuroscience of Drug Addiction                       |         |         |
| or                         | or   |         |         |
| #NEUR 4364                 | Neuroscience of Language and Communication Disorders |         | (3) ( ) |

#### 4. Restricted Electives (12 Total Credits)

Students must complete 12 credits of restricted electives including:

- a. At least two (2) of the following: NEUR2464, NEUR4454, NEUR4544
- b. At least three (3) additional credits of courses with a "NEUR" prefix from the approved list
- c. At least three (3) additional restricted elective credits from the approved list

##### Section 4a. (6 credits)

Choose two (2) of the following courses. Courses may not double count with the credits chosen for any other CBNU requirement. If NEUR2464 is selected as an option, you must choose 3 credits from section 4b or 4c at the 3000-level or 4000-level such that at least 6 of the 12 total restricted elective credits are at the 3000/4000 level.

|  |                                 |     |     |
|--|---------------------------------|-----|-----|
| NEUR 2464  | Neuroscience and Society        | (3) | ( ) |
| #NEUR 4454   | Neuroeconomics                  | (3) | ( ) |
| (NEUR 4454 is cross listed with ECON4454 and PSYC4454) |                                 |     |     |
| #NEUR4544  | Synaptic Structure and Function | (3) | ( ) |

##### Section 4b. (3 credits)

Choose one (1) of the following courses. Courses may not double count with the credits chosen for any other CBNU requirement. If NEUR4994 is selected, research must total to 3 credits.

|  |  |     |     |
|--|--|-----|-----|
| NEUR 2464  | Neuroscience and Society                             | (3) | ( ) |
| #NEUR 2554   | Experimental Neuroscience                            | (3) | ( ) |
| #NEUR 3044   | Cellular and Molecular Neuroscience                  | (3) | ( ) |
| #NEUR 3064   | Educational Neuroscience                             | (3) | ( ) |
| #NEUR 3234   | The Artificial Brain                                 |     |     |
| #NEUR 3554   | Neuroscience Research and Practical Experience       | (3) | ( ) |
| #NEUR3774  | Neuroendocrinology                                   | (3) | ( ) |
| #NEUR3844  | Computational Neuroscience & Neural Engineering      | (3) | ( ) |
| #NEUR 3914   | Neuroscience of Drug Addiction                       | (3) | ( ) |
| #NEUR 4034   | Diseases of the Nervous System                       | (3) | ( ) |
| #NEUR 4314   | Genetics in Neuroscience                             | (3) | ( ) |
| #NEUR 4364   | Neuroscience of Language and Communication Disorders | (3) | ( ) |
| #NEUR 4454   | Neuroeconomics                                       | (3) | ( ) |
| (NEUR 4454 is cross listed with ECON4454 and PSYC4454)                     |  |     |     |
| #NEUR 4514   | Neuroimmunology                                      | (3) | ( ) |
| #NEUR 4544   | Synaptic Structure and Function                      | (3) | ( ) |
| #NEUR 4814   | Nutritional Neuroscience                             | (3) | ( ) |
| #NEUR 4594   | Clinical Neuroscience in Practice                    | (3) | ( ) |
| NEUR 4994  | Undergraduate Research                               | (3) | ( ) |
| (NEUR4994 may only be taken after two terms of research at the 2994 level) |  |     |     |

##### Section 4c. (3 credits)

Choose at least three (3) credits from the below list of courses. Courses may not double count with the credits chosen for any other CBNU requirement.

|                |   |     |     |
|----------------|---|-----|-----|
| #ALS 2304      | Comparative Animal Physiology and Anatomy | (4) | ( ) |
| #ALS/BIOL 4554 | Neurochemical Regulation                  | (3) | ( ) |
| #BCHM 2024     | Concepts of Biochemistry                  | (3) | ( ) |
| #BCHM 3114     | Biochemistry for Biotech                  | (3) | ( ) |
| #BIOL 2004     | Genetics                                  | (3) | ( ) |
| #BIOL 2134     | Cell Function and Differentiation         | (3) | ( ) |
| #BIOL 3404     | Introductory Animal Physiology            | (3) | ( ) |



|  |   |     |     |     |     |
|--|---|-----|-----|-----|-----|
| #BIOL 4824   | Bioinformatics Methods                                      |     | (3) | ( ) |     |
| #BMSP 2135-2136  | Human Anatomy and Physiology                                | (3) | ( ) | (3) | ( ) |
| CHEM 1045-1046   | General Chemistry Laboratory                                | (1) | ( ) | (1) | ( ) |
| #CHEM 2514   | Survey of Organic Chemistry                                 |     | (3) | ( ) |     |
| #CHEM 2535-2536  | Organic Chemistry   | (3) | ( ) | (3) | ( ) |
| #CHEM 2545-2546  | Organic Chemistry Laboratory                                | (1) | ( ) | (1) | ( ) |
| #CHEM 4554   | Drug Chemistry  |     | (3) | ( ) |     |
| #CHEM 4615-4616  | Physical Chemistry for the Life Sciences                    | (3) | ( ) | (3) | ( ) |
| NEUR 2464  | Neuroscience and Society                                    |     | (3) | ( ) |     |
| #NEUR 2554   | Experimental Neuroscience                                   |     | (3) | ( ) |     |
| #NEUR 3044   | Cellular and Molecular Neuroscience                         |     | (3) | ( ) |     |
| #NEUR 3064   | Educational Neuroscience                                    |     | (3) | ( ) |     |
| #NEUR 3234   | The Artificial Brain  |     | (3) | ( ) |     |
| #NEUR 3554   | Neuroscience Research and Practical Experience              |     | (3) | ( ) |     |
| #NEUR3774  | Neuroendocrinology  |     | (3) | ( ) |     |
| #NEUR3844  | Computational Neuroscience & Neural Engineering             |     | (3) | ( ) |     |
| #NEUR 3914   | Neuroscience of Drug Addiction                              |     | (3) | ( ) |     |
| #NEUR 4034   | Diseases of the Nervous System                              |     | (3) | ( ) |     |
| #NEUR 4314   | Genetics in Neuroscience                                    |     | (3) | ( ) |     |
| #NEUR 4364   | Neuroscience of Language and Communication Disorders        |     | (3) | ( ) |     |
| #NEUR 4454   | Neuroeconomics  |     | (3) | ( ) |     |
| (NEUR 4454 is cross listed with ECON4454 and PSYC4454)                     |   |     |     |     |     |
| #NEUR 4514   | Neuroimmunology   |     | (3) | ( ) |     |
| #NEUR 4544   | Synaptic Structure and Function                             |     | (3) | ( ) |     |
| #NEUR 4814   | Nutritional Neuroscience                                    |     | (3) | ( ) |     |
| #NEUR 4594   | Clinical Neuroscience in Practice                           |     | (3) | ( ) |     |
| NEUR 4994  | Undergraduate Research                                      |     | (3) | ( ) |     |
| (NEUR4994 may only be taken after two terms of research at the 2994 level) |   |     |     |     |     |
| #PHYS 2205-2206  | General Physics   | (3) | ( ) | (3) | ( ) |
| #PHYS 2215-2216  | General Physics Laboratory                                  | (1) | ( ) | (1) | ( ) |
| #PHYS 4714   | Introduction to Biophysics                                  |     | (3) | ( ) |     |
| #PSYC 4044   | Advanced Learning   |     | (3) | ( ) |     |
| #PSYC 4064   | Physiological Psychology                                    |     | (3) | ( ) |     |
| #PSYC 4074   | Sensation and Perception                                    |     | (3) | ( ) |     |
| #PSYC 4114   | Cognitive Psychology  |     | (3) | ( ) |     |
| #STAT 3424   | Introduction to Statistical Neuroscience and Image Analysis |     | (3) | ( ) |     |
| #STAT 4204   | Experimental Designs  |     | (3) | ( ) |     |

#### 5. Free Electives (28 Credits)

|       |        |       |        |
|-------|--------|-------|--------|
| _____ | (__cr) | _____ | (__cr) |
| _____ | (__cr) | _____ | (__cr) |
| _____ | (__cr) | _____ | (__cr) |
| _____ | (__cr) | _____ | (__cr) |
| _____ | (__cr) | _____ | (__cr) |

#### Acceptable Substitutions:

BIOL 1105: BIOL 1005 General Biology  
 BIOL 1106: BIOL 1006 General Biology  
 BIOL 1115: BIOL 1015 General Biology Lab  
 BIOL 1116: BIOL 1016 General Biology Lab  
 CHEM 1035-1036: CHEM 1055-1056 General Chemistry for Chemistry Majors



CHEM 1045-1046: CHEM 1065-1066 General Chemistry for Chemistry Majors Lab  
MATH 1025-1026: MATH 1225-1226 Calculus of a Single Variable  
PHYS 2205, 2215: PHYS 2305 Foundations of Physics I  
PHYS 2206, 2216: PHYS 2306 Foundations of Physics II

**Double Majors/Minors:** The School of Neuroscience offers majors in Cognitive and Behavioral Neuroscience, Clinical Neuroscience, Computational and Systems Neuroscience, and Experimental Neuroscience. Courses for these majors overlap slightly. Therefore, students may not pursue multiple majors within the School.

**Foreign Language Requirement:** Students who did not successfully complete at least two years of a single foreign, classical, or sign language during high school must successfully complete six semester hours of a single foreign, classical, or sign language at the college level. Courses taken to meet this requirement do not count toward the hours required for graduation. Please consult the Undergraduate Catalog for details.

**<sup>1</sup>Grade Requirements:** Students must earn a grade of "C-" or better in all core neuroscience coursework (CHEM1035, CHEM1036, NEUR1004, NEUR2025, NEUR2026, NEUR2035, NEUR2036, NEUR4044, PSYC1004) or the equivalent coursework. Students must also earn a "C-" or better in BIOL1105, BIOL1106, BIOL1115, BIOL1116, MATH1025, and MATH1026. Only two attempts, including course withdrawals with a grade of "W," are allowed for each core neuroscience course, BIOL1105, BIOL1106, BIOL1115, BIOL1116, MATH1025, and MATH1026.

**Graduation Requirements:** Student must complete a minimum of 120 credit hours with an overall GPA of 2.0 and a minimum in-major GPA of 2.0. For purposes of GPA computation, courses IN-MAJOR will include Core requirements, Major requirements, Restricted Electives, BIOL 1105, 1106, 1115, 1116, and MATH 1025-1026.

**#Prerequisites:** This check sheet contains courses that have at least one prerequisite that may not be included as part of this degree. Please see your advisor or consult the Undergraduate Course Catalog for more information.

**Progress Toward Degree Policy:** After attempting 72 credits, students must have completed BIOL 1105, 1106, 1115, 1116, CHEM 1035-1036, NEUR 2025-2026 and 2035-2036; have a minimum overall GPA of 2.5; and have completed at least 24 credits that apply to the University Curriculum for Liberal Education requirements.

**Terminology:**

CLE Requirements: Curriculum for Liberal Education Requirements are defined by the university with the goal "to empower students with a broad base of knowledge and transferable skills through exposure to multiple disciplines and ways of knowing."

Core Neuroscience Requirements: Core neuroscience requirements are those requirements that must be fulfilled by all students in the School of Neuroscience, regardless of major.

Major Requirements: Major requirements are those requirements that are unique to the CBNU major and do not apply across all School of Neuroscience majors.

Restricted Elective: Restricted elective courses provide students the autonomy to select 12 or more credits of coursework within an approved list to count towards the students' degree requirements. These courses expand on the depth and breadth of the CBNU major.

Free Elective: Free elective credits may consist of any credit-bearing Virginia Tech coursework to ensure that students reach the 120 credits required by the university to earn a bachelor's degree. Coursework that does not apply elsewhere towards the degree will apply here (this includes non-duplicative coursework for double majors, minors, or AP coursework that does not count elsewhere towards the degree).