

Neuroscience, BS

What: Removing allowance for a C- in BIOL 213 and 311.

Why: The new lab, BIOL 215 will require a grade of C in 213, this wording would now be misleading for some students in retake situations, or those who choose BIOL 311 (for which BIOL 213 is required with a C or better).

The Bachelor of Science in Neuroscience is an interdisciplinary program emphasizing the relationship between the biology and chemistry of the nervous system and the behavior of an organism. The BS prepares students for graduate level study in both medical school and doctoral and master's level programs in neuroscience and other health-related fields, and work in the neuroscience field.

Admissions

University-wide admissions policies can be found in the [Undergraduate Admissions Policies](#) section of this catalog.

To apply for this program, please complete the [George Mason University Admissions Application](#).

Policies

Students must fulfill all [Requirements for Bachelor's Degrees](#), including the [Mason Core](#).

[NEUR 411](#) Seminar in Neuroscience ([Mason Core](#)) fulfills the writing intensive requirement.

For policies governing all undergraduate programs, see [AP.5 Undergraduate Policies](#).

Banner Code: SC-BS-NEUR

Degree Requirements

Total credits: minimum 120

Students should refer to the [Admissions & Policies](#) tab for specific policies related to this program.

HIDE ALL 

Foundation Courses EXPAND 

Biology

BIOL 213 Cell Structure and Function ~~X~~ 4

Select one from the following. ~~X~~² 3-4

BIOL 311 General Genetics

BIOL 322 Developmental Biology

BIOL 326 Animal Physiology

BIOL 425 Human Physiology

BIOL 430 Advanced Human Anatomy and Physiology I

Chemistry

CHEM 211 General Chemistry I (Mason Core) 4
& CHEM 213 and General Chemistry Laboratory I (Mason Core)

CHEM 212 General Chemistry II (Mason Core) 4
& CHEM 214 and General Chemistry Laboratory II (Mason Core)

Mathematics

Select one option (4 or 6 credits) from the following: 4-6

MATH 113 Analytic Geometry and Calculus I (Mason Core)

MATH 123 Calculus with Algebra/Trigonometry, Part A
& MATH 124 and Calculus with Algebra/Trigonometry, Part B (Mason Core)

Statistics

Select one course (3 or 4 credits) from the following: 3-4

BIOL 214 Biostatistics for Biology Majors

STAT 250 Introductory Statistics I (Mason Core)

PSYC 300 Statistics in Psychology

MATH 352 Statistics

Physics

Select one of the following sequences: 8

PHYS 243 College Physics I (Mason Core)
& PHYS 244 and College Physics I Lab (Mason Core)
& PHYS 245 and College Physics II (Mason Core)
& PHYS 246 and College Physics II Lab (Mason Core)

PHYS 160 University Physics I (Mason Core)
& PHYS 161 and University Physics I Laboratory (Mason Core)
& PHYS 260 and University Physics II (Mason Core)
& PHYS 261 and University Physics II Laboratory (Mason Core)

Psychology ^{1,3}

PSYC 100 Introduction to Psychology (Mason Core) 3

PSYC 375 Brain and Sensory Processes 3

PSYC 376 Brain and Behavior 3

Computer Science

CDS 130 Computing for Scientists (Mason Core) 3

Core Courses in Neuroscience ¹

NEUR 327 Cellular Neuroscience 5
& NEUR 328 and Cellular Neuroscience Lab

NEUR 335 Developmental and Systems Neuroscience 3

Technical Writing ^{1,2,4}

NEUR 411 Seminar in Neuroscience (Mason Core) 3

Required Psychology Lab Course ¹

PSYC 373 Biopsychology Laboratory 2

Total Credits

55-59

- 1 Students must earn a minimum grade of 1.67 (C-) in these courses.
- 2 The course chosen to fulfill this requirement cannot be applied as a Major Elective.
- 3 Transfer students who have earned transfer credit for [PSYC 372](#) Biopsychology may substitute this course for [PSYC 375](#) Brain and Sensory Processes.
- 4 This course fulfills the writing intensive requirement.

Major Electives

EXPAND 

Students should consult with an advisor to choose elective courses. The list below includes pre-approved courses. Elective courses not on the list must be approved by an advisor. Only courses not already taken in the degree will apply as electives, with the exception of seminar and topics courses; a different topic must be addressed in the second instance of a seminar or topics course. Students may apply no more than 6 credits of courses with a grade of 'D' to this requirement.

Students intending to pursue a doctorate in neuroscience or a medical degree are advised to take [CHEM 313](#) Organic Chemistry I and [CHEM 315](#) Organic Chemistry Lab I, and consult an advisor for other elective recommendations.

Select 22 credits of major electives. The list below includes pre-approved courses.
Elective courses not on the list must be approved by an advisor.

22

BENG 101	Introduction to Bioengineering
BENG 434	Computational Modelling of Neurons and Networks
BIOL 305	Biology of Microorganisms
BIOL 306	Biology of Microorganisms Laboratory
BIOL 311	General Genetics
BIOL 322	Developmental Biology
BIOL 323	Environmental Effects on Embryonic Development

<u>BIOL 326</u>	Animal Physiology
<u>BIOL 417</u>	Selected Topics in Molecular and Cellular Biology (when the topic is: Foundations of the Mammalian Brain)
<u>BIOL 420</u>	Vaccines
<u>BIOL 425</u>	Human Physiology
<u>BIOL 426</u>	Mechanisms of Aging
<u>BIOL 429</u>	Biological Foundations of Pharmacology
<u>BIOL 430</u>	Advanced Human Anatomy and Physiology I
<u>BIOL 431</u>	Advanced Human Anatomy and Physiology II
<u>BIOL 432</u>	Clinical Applications in Human Physiology
<u>BIOL 452</u>	Immunology
<u>BIOL 453</u>	Immunology Laboratory
<u>BIOL 471</u>	Evolution
<u>BIOL 482</u>	Introduction to Molecular Genetics
<u>BIOL 483</u>	General Biochemistry
<u>BIOL 484</u>	Cell Signaling and Disease
<u>BIOL 515</u>	Developmental Neurobiology
<u>CDS 301</u>	Scientific Information and Data Visualization
<u>CHEM 313</u>	Organic Chemistry I
<u>CHEM 314</u>	Organic Chemistry II
<u>CHEM 315</u>	Organic Chemistry Lab I

<u>CHEM 318</u>	Organic Chemistry Lab II
<u>CHEM 321</u>	Quantitative Chemical Analysis
<u>CHEM 463</u>	General Biochemistry I
<u>CHEM 464</u>	General Biochemistry II
<u>CHEM 465</u>	Biochemistry Lab (<u>Mason Core</u>)
<u>MATH 114</u>	Analytic Geometry and Calculus II
or <u>MATH 116</u>	Analytic Geometry and Calculus II (Honors)
<u>MATH 203</u>	Linear Algebra
<u>MATH 213</u>	Analytic Geometry and Calculus III
<u>NEUR 355</u>	Cross-Cultural Studies in Scientific Inquiry (<u>Mason Core</u>)
<u>MATH 214</u>	Elementary Differential Equations
<u>NEUR 405</u>	RS: Laboratory Methods in Behavioral Neuroscience
<u>NEUR 406</u>	Zebrafish Neurodevelopment Laboratory
<u>NEUR 407</u>	Lab Investigations Using Voltage Clamp Electrophysiology
<u>NEUR 410</u>	Current Topics in Neuroscience (when not used to fulfill the technical writing requirement) ¹
<u>NEUR 411</u>	Seminar in Neuroscience (<u>Mason Core</u>) ¹
<u>NEUR 422</u>	Glutamatergic Systems
<u>NEUR 424</u>	Sleep and Circadian Rhythms (<u>Mason Core</u>).
<u>NEUR 440</u>	Independent Study in Neuroscience
<u>NEUR 450</u>	Honors Thesis Proposal
<u>NEUR 451</u>	Honors Thesis

NEUR 461	Special Topics in Neuroscience
NEUR 473	Current Neuroscience Research in Germany (Mason Core).
NEUR 480	Biological Bases of Alzheimer's Disease
PHYS 262	University Physics III (Mason Core).
PHYS 263	University Physics III Laboratory (Mason Core).
PSYC 304	Principles of Learning (Mason Core).
PSYC 309	Sensation, Perception, and Information Processing (Mason Core).
PSYC 317	Cognitive Psychology
PSYC 441	Criminal Behavior: Psychological and Neurological Aspects
PSYC 472	Current Topics in Brain and Behavior

Total Credits

22

¹ This course fulfills the writing intensive requirement.

Mason Core and Elective Credits

EXPAND 

In order to meet a minimum of 120 credits, this degree requires an additional 39-43 credits which may be applied toward any remaining [Mason Core](#) requirements (outlined below), [Requirements for Bachelor's Degrees](#), and elective courses. Students are strongly encouraged to consult with their advisors to ensure that they fulfill all requirements.

Mason Core

Some [Mason Core](#) requirements may already be fulfilled by the major requirements listed above. Students are strongly encouraged to consult their advisors to ensure they fulfill all remaining [Mason Core](#) requirements.

Students who have completed the following credentials are eligible for a waiver of the Foundation and Exploration (lower level) requirement categories. The Integration category (upper level) is not waived under this policy. See [Admissions](#) for more information.

- VCCS Uniform Certificate of General Studies
- VCCS or Richard Bland Associate of Science (A.S.), Associate of Arts (A.A.), Associate of Arts and Sciences (A.A.&S.), or Associate of Fine Arts (A.F.A.)

Foundation Requirements

Written Communication (lower-level)	3
Oral Communication	3
Quantitative Reasoning	3
Information Technology and Computing	3

Exploration Requirements

Arts	3
Global Contexts	3
Global History	3
Literature	3
Natural Science	7
Social and Behavioral Sciences	3
Just Societies (optional) ¹	

Integration Requirements

Written Communication (upper-level)	3
Writing Intensive ²	3

Total Credits

40

- 1 In addition to covering content related to the designated category, Exploration level courses marked with a Just Societies "flag" are specifically designed to help students learn how to interact effectively with others from all walks of life, including those with backgrounds and beliefs that differ from their own. Students who wish to increase their knowledge and skills in this area may choose to enroll in a Just Societies-flagged course. Students interested in this approach to completing their Mason Core Exploration Requirements should work closely with their advisor to identify the appropriate Just Societies-flagged courses.
- 2 Most programs include the writing-intensive course designated for the major as part of the major requirements; this course is therefore not counted towards the total required for Mason Core.
- 3 Minimum 3 credits required.

Honors in the Major

Highly-qualified students may apply to graduate with honors in the major.

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Eligibility EXPAND 

Honors Requirements EXPAND 

ON THIS PAGE

- [Neuroscience, BS/Biology, Accelerated MS](#)
- [Bachelor's Degree \(selected\), Bioinformatics Management, Accelerated PSM](#)

Neuroscience, BS/Biology, Accelerated MS

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Overview	EXPAND +
Application Requirements	EXPAND +
Accelerated Option Requirements	EXPAND +
Reserve Graduate Credit	EXPAND +
Graduate Course Suggestions	EXPAND +

Bachelor's Degree (selected), Bioinformatics Management, Accelerated PSM

Overview	EXPAND +
Application Requirements	EXPAND +
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Neuroscience Minor