INTERDISCIPLINARY PROGRAM IN NEUROSCIENCE

NEUROSCIENCE, B.S.

2024-2025

Orientation Quick-Sheet

Essential Resources (bookmark these pages)

- **Where do I get help from Mason Neuroscience?**
  - E-mail: neurosci@gmu.edu
  - Website: https://cos.gmu.edu/neuroscience/
  - Advising
    - Instructions for booking advising appointments Neuroscience Advising | GMU College of Science
    - We strongly recommend making a full degree plan and discussing it with an advisor early and often.
    - **Advising is usually online.** In-person advising may be available through Navigate or by contacting an advisor.
  - Twitter: @MasonNeuro
  - Instagram: masonneuroscience
- **What classes do I take?**
  - See "Registration" section below for first-semester classes. View sample schedule in this packet.
  - BS Neuroscience Curriculum
    - **Official Mason Catalog**: https://catalog.gmu.edu/colleges-schools/science/neuroscience-program/neuroscience-bs/#requirementstext
    - **Mason Core** courses are listed here: https://catalog.gmu.edu/mason-core/
  - Degree Evaluation: View your degree progress regularly in Degree Works (this program will be changing later this year, you will receive communication about this) through Patriot Web https://patriotweb.gmu.edu. Instructions here: https://registrar.gmu.edu/students/degree-evaluation/degree-works/
- **Health Professions Advising**: https://prehealth.gmu.edu/
  - E-mail: prehlth@gmu.edu
  - All pre-health students should join the list serv (under recourses on the website) to get emails from pre-health advising
- **Transfer Credit Services**: https://www2.gmu.edu/admissions-aid/how-apply/transfer/transfer-credit-policy
  - For issues related to AP/IB scores and transfer credit. Make sure to send your AP/IB scores and all transcripts within the first year!
- **Math Placement Exam:** http://math.gmu.edu/placement_test.php

Registration (Freshman)

A full course load is ~15 credits per semester. We advise students to balance their course load and take no more than 2 science lab courses per semester. Work with an advisor to create a course schedule for each semester and to choose appropriate neuroscience electives. Information on how to register is at https://registrar.gmu.edu/topics/registration-guide/. **What do I register for in the first semester?** Please note, these are good *options* of courses for first-year students. You should not take *all* of these in the first semester. However, we highly recommend you start on Biology and Chemistry early.

- Biology
  - **BIOL 103: Introductory Biology II- Survey of Cell and Molecular Biology**
  - If you have credit for BIOL 103 equivalent, take **BIOL 213: Cell Structure and Function**
- Chemistry
  - Take **CHEM 211&213: General Chemistry I and lab**
- Psychology
  - If you have no psychology credit, take **PSYC 100: Basic Concepts in Psychology**
    - If you have credit for PSYC 100 through an AP exam, you will not need to take this course
- Math or Statistics
  - **MATH 105: Precalculus** OR **MATH 123: Calculus with Algebra/Trig Path A** OR **MATH 113: Calculus** depending on placement exam score. *Information about the placement test is found here* http://math.gmu.edu/placement_test.php.
  - Approved statistics course (**STAT 250, BIOL 214, PSYC 300, or MATH 352**)
- **NEUR 101: Introduction to Neuroscience**
  - This course is not required, but serves as a good introduction for students who want to get started on neuroscience content in their first year. This will count as a neuroscience elective if taken before PSYC or NEUR 300-level courses.

- **Mason Core** courses such as ENGH 101, COMM 100 or 101, or an approved Arts, History, or Global Understanding course.
    - A list of approved Mason core courses can be found here: https://catalog.gmu.edu/mason-core/
- UNIV 100: Introduction to Mason

Registration (Transfer)

A full course load is ~15 credits per semester. We recommend a maximum of 13 credits for first-semester transfer students. We advise students to balance their course load and take no more than 2 science lab courses per semester. Work with an advisor to create a course schedule for each semester and to choose appropriate neuroscience electives. Information on how to register is at https://registrar.gmu.edu/topics/registration-guide/

What do I register for in the first semester?

- Biology
    - **BIOL 103: Introductory Biology II- Survey of Cell and Molecular Biology, OR**
    - If have credit for BIOL 103 equivalent, take **BIOL 213: Cell Structure and Function**
    - If you have credit for BIOL 213, take **BIOL 311: General Genetics** in you are pre-health. If you are not pre-health, you can consider one of the other BIOL options in the catalog.
- Chemistry
    - If you have no Chemistry credit, take **CHEM 211&213: General Chemistry I and lab**
    - If you have credit for CHEM 211&213, take **CHEM 212&214: General Chemistry II and lab**
    - If you have credit for CHEM 211&213 and 213&214 and wish to pursue a health profession or graduate school, take **CHEM 313&315: Organic Chemistry I and Lab**
- Psychology
    - If you have no psychology credit, take **PSYC 100: Basic Concepts in Psychology**
    - If you have credit for PSYC 100, **take PSYC 375: Brain and Sensory Processes**
- Math or Statistics
    - **MATH 105: Precalculus** OR **MATH 123: Calculus with Algebra/Trig Path A** OR **MATH 113: Calculus** depending on placement exam score. *Placement test instructions for math are found here* http://math.gmu.edu/placement_test.php.
    - Approved statistics course (**STAT 250, BIOL 214, PSYC 300, or MATH 352**)
- **NEUR 101: Introduction to Neuroscience**
    - This course is not required, but serves as a good introduction for students who want to get started on neuroscience content right away. This will count as a neuroscience elective if taken before PSYC or NEUR 300-level courses.
- Neuroscience Electives: Pre-health courses of other electives (discuss with an advisor)
- Remaining Mason Core courses (do not take the writing intensive NEUR 411 in the first semester)
    - A list of approved Mason core courses can be found here: https://catalog.gmu.edu/mason-core/

Table of Contents

Bachelor of Science (B.S.) in Neuroscience

The B.S. in Neuroscience is an interdisciplinary program emphasizing the relationship between the biology and chemistry of the nervous system and the behavior of an organism. This degree prepares students for medical school and other health-related fields, graduate study in neuroscience, and industry work in the neuroscience field.

The program blends core coursework in biology, chemistry, psychology, physics, mathematics, and computer science with dedicated neuroscience courses. Students choose elective courses in neuroscience or related disciplines, which enable them to tailor the degree to their specific interests. For example, students with a strong psychology interest may take a combination of psychology and neuroscience courses for their electives, while students with a biology interest may take more biology courses for their electives. The official, up to date, neuroscience curriculum is available in the university course catalog at **catalog.gmu.edu**. Previous catalog years can be accessed at **https://catalog.gmu.edu/archives/.**

Essential Resources

Mason Neuroscience Website: https://cos.gmu.edu/neuroscience/

Official Mason Catalog: https://catalog.gmu.edu/

Health Professions Advising: https://prehealth.gmu.edu/

Degree Evaluation: View in **Degree Works** through Patriot Web https://patriotweb.gmu.edu. Instructions here: https://registrar.gmu.edu/students/degree-evaluation/degree-works/

Transfer Credit Services:
https://www2.gmu.edu/admissions-aid/how-apply/transfer/transfer-credit-policy

Advising
E-mail: neurosci@gmu.edu
Appointment Instructions: https://cos.gmu.edu/neuroscience/advising/

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Masonneuroscience

Neuroscience, B.S. Degree Requirements

Students must complete at minimum of 120 credits applicable to their degree, with a minimum of 45 upper-level credits (300 level and above). THIS IS AN UNOFFICIAL SUMMARY, OFFICIAL REQUIREMENTS ARE IN THE CATALOG https://catalog.gmu.edu/.

I. Neuroscience Major Requirements			78-81 Credits
A. Two Courses in Biology			
☐ BIOL 213: Cell Structure and Func		*C or better required*	4 Credits
Choose one of the following:		*C- or better required*	3-4 Credits
☐ BIOL 311: General Genetics	☐ BIOL 326 Animal Physiology		
☐ BIOL 322 Developmental Biology	☐ BIOL 425 Human Physiology		
☐ BIOL 430: Advanced Human Anatomy and Physiology I			
B. Two Courses in Chemistry with Lab			
☐ CHEM 211: General Chemistry I	CHEM 213 (Lab)	*C or better required*	4 Credits
☐ CHEM 212: General Chemistry II	CHEM 214 (Lab)		4 Credits
C. One Course or Sequence in Mathematics			
Choose one option from the following:			4-6 Credits
☐ MATH 113: Analytical Geometry and Calcul			
☐ MATH 123: Calculus with Algebra/Trig, Part			
& MATH 124: Calculus with Algebra/Trig, Part B			
D. One Course in Statistics			
Choose one of the following:			3-4 Credits
☐ BIOL 214: Biostatistics	☐ PSYC 300: Statistics in Psychology		
☐ STAT 250: Introductory Statistics I	☐ MATH 352: Statistics		
E. One Course in Computer Science			
☐ CDS 130: Computing for Scientists			3 Credits
F. Two Courses in Physics with Lab			
Choose one sequence:			8 Credits
☐ PHYS 243: College Physics I	PHYS 244 (Lab)		
& PHYS 245: College Physics II and	PHYS 246 (Lab)		
OR			
☐ PHYS 160: University Physics I	PHYS 161 (Lab)		
& PHYS 260: University Physics II and	PHYS 261 (Lab)		
G. Four Courses in Psychology			
☐ PSYC 100: Basic Concepts in Psychology		*C- or better required*	3 Credits
☐ PSYC 375: Brain and Sensory Processes		*C- or better required*	3 Credits
☐ PSYC 376: Brain and Behavior		*C- or better required*	3 Credits
☐ PSYC 373: Biopsychology Labora		*C- or better required*	2 Credits
H. Three Core Courses in Neuroscience			
☐ NEUR 327: Cellular Neuroscience & NEUR 328: Cellular Neuroscience Lab		*C- or better required*	4 Credits
☐ NEUR 335: Developmental and Systems Neuroscience		*C- or better required*	2 Credits
I. One Course in Technical Writing			
☐ NEUR 411: Seminar in Neuroscier		*C- or better required*	3 Credits
J. Neuroscience Electives			
☐ See list of approved courses on **page 7-8** and at **catalog.gmu.edu**		≤ 6 credits of D	22 Credits

II. University-wide, Mason Core Requirements — 24 Credits

Foundation Requirements

A. Oral Communication

☐ ____Select an approved course at https://catalog.gmu.edu/mason-core/ — 3 Credits

B. Written Communication (lower level)

Choose one course: — 3 Credits

☐ ENGH 100: Composition for Multilingual Writers — *C or better required*

☐ ENGH 101: Composition — *C or better required*

C. Information Technology and Computing

☐ CDS 130: Computing for Scientists — *Neuroscience Requirement — Counted Above

D. Quantitative Reasoning

☐ MATH 113: Analytical Geometry and Calculus I — *Neuroscience Requirement — Counted Above

OR

☐ MATH 123: Calculus with Algebra/Trig, Part A & MATH 124: Calculus with Algebra/Trig, Part B — *Neuroscience Requirement

Exploration Requirements

E. Arts

☐ _____Select an approved course at https://catalog.gmu.edu/mason-core/ — 3 Credits

F. Global Contexts

☐ _____Select an approved course at https://catalog.gmu.edu/mason-core/ — 3 Credits

G. Literature

☐ _____Select an approved course at https://catalog.gmu.edu/mason-core/ — 3 Credits

H. Natural Science

☐ BIOL 213: Cell Structure and Function — *Neuroscience Requirement — Counted Above

☐ CHEM 211: General Chemistry I — *Neuroscience Requirement — Counted Above

I. Social and Behavioral Sciences

☐ PSYC 100 Basic Concepts in Psychology — *Neuroscience Requirement — Counted Above

J. Global History

☐ HIST 100: History of Western Civilization — 3 Credits

Integration Requirements

K. Written Communication (upper level)

☐ ENGH 302: Advanced Composition — *C or better required* *Literature (G. above) is a prerequisite* — 3 Credits

L. Writing-Intensive

☐ NEUR 411: Seminar in Neuroscience — *Neuroscience Requirement — Counted Above

M. Synthesis/Apex

☐ ____Select an approved course at https://catalog.gmu.edu/mason-core/. NEUR 424 and 473 are good options (more may be approved over time). — 3 Credits

Some Mason Core requirements (designated *Neuroscience Requirement), are fulfilled by the major requirements on the previous page. Students are strongly encouraged to consult their advisors to ensure they fulfill all remaining Mason Core requirements. Official Mason Core requirements are listed at https://catalog.gmu.edu/mason-core/.

III. General Electives — 15-18 Credits

Additional coursework to reach 120 total credits applicable to degree, with at least 45 Upper Level credits (300 – level or above)

Grand Total (I Neuroscience Requirements) + (II Mason Core) + (III General Electives) =	**120 Credits**

Neuroscience Electives

Students are required to take 22 credits of neuroscience electives. No more than 6 credits of coursework with a grade of D can be applied to neuroscience electives. Students should consult with an advisor to choose appropriate elective courses. **The official, up-to-date list of courses is found in a catalog**. Courses that are not on the pre-approved list in the catalog must be approved by the director of the program. If you would like to inquire about approval of a course not on the list, are unsure if a course will count as a neuroscience elective, or if you have taken a course listed below and it is not showing as a neuroscience elective in Degree Works, please e-mail an advisor at neurosci@gmu.edu.

WARNING: Be advised that many of the courses below require prerequisites, which may or may not be included as part of the neuroscience curriculum. Courses with **required** prerequisites are listed with a "P". Courses without a "P" may still have *recommended* prerequisites. Be sure to look up current pre-requisites when creating a 4-year plan. Consult the course catalog https://catalog.gmu.edu/ and/or an advisor to ensure you take the proper pre-requisite courses.

Once the schedule is posted for a given semester, we commonly post the electives that are offered on our advising website https://science.gmu.edu/academics/departments-units/neuroscience/advising. Check the menu on the left side of the site.

Choose 22 credits from the following	Credits
☐ BENG 101 Introduction to Bioengineering	3
☐ BENG 313 Physiology for Engineers P	3
☐ BENG 434 Computational Modeling of Neurons and Networks P	3
☐ BIOL 305 Biology of Microorganisms P	3
☐ BIOL 306 Biology of Microorganisms Laboratory P	1
☐ BIOL 311 General Genetics (when not used to fulfill biology requirement for the major) P	4
☐ BIOL 322 Developmental Biology (when not used to fulfill biology requirement for the major)	3
☐ BIOL 323 Lab for Developmental Biology	1
☐ BIOL 326 Animal Physiology (when not used to fulfill biology requirement for the major)	3
☐ BIOL 417 Selected Topics in Molecular and Cellular Biology (when topic is Foundations of the Mammalian Brain)	1-4
☐ BIOL 420 Vaccines P	3
☐ BIOL 425 Human Physiology (when not used to fulfill biology requirement for the major)	3
☐ BIOL 426 Mechanisms of Aging	3
☐ BIOL 427: Biology of Obesity and Weight Loss (summer only)	3
☐ BIOL 430 Advanced Human Anatomy and Physiology I P	4
☐ BIOL 431 Advanced Human Anatomy and Physiology II P	4
☐ BIOL 432 Clinical Applications in Human Physiology P	4
☐ BIOL 452 Immunology P	3
☐ BIOL 453 Immunology Laboratory P	1
☐ BIOL 471 Evolution P	3
☐ BIOL 482 Introduction to Molecular Genetics	3
☐ BIOL 483 General Biochemistry P	4
☐ BIOL 484 Cell Signaling and Disease P	3
☐ BIOL 515 Developmental Neurobiology* (special permission required)	3
☐ CDS 301 Scientific Information and Data Visualization	3
☐ CHEM 313 Organic Chemistry I P	3
☐ CHEM 315 Organic Chemistry Lab I P	2
☐ CHEM 314 Organic Chemistry II P	3
☐ CHEM 318 Organic Chemistry Lab II P	2

☐	CHEM 321 Quantitative Chemical Analysis [P]	4
☐	CHEM 463 General Biochemistry I [P]	4
☐	CHEM 465 Biochemistry Lab [P]	2
☐	CHEM 464 General Biochemistry II [P]	3
☐	MATH 114 Analytic Geometry and Calculus II or MATH 116 Analytic Geometry and Calculus II (Honors) [P]	4
☐	MATH 203 Linear Algebra [P]	3
☐	MATH 213 Analytic Geometry and Calculus III [P]	3
☐	MATH 214 Elementary Differential Equations [P]	3
☐	NEUR 405 RS: Laboratory Methods in Behavioral Neuroscience	3
☐	NEUR 407 Lab Investigations Using Voltage Clamp Electrophysiology [P]	3
☐	NEUR 410 Current Topics in Neuroscience (when not used to fulfill the technical writing requirement)	3
☐	NEUR 411 Seminar in Neuroscience (when not used to fulfill the technical writing requirement)	3
☐	NEUR 422 Glutamatergic Systems [P]	3
☐	NEUR 424 Sleep and Circadian Rhythms	3
☐	NEUR 440 Independent Study in Neuroscience	1-3
☐	NEUR 450 Honors Thesis Proposal (special permission required)	2-3
☐	NEUR 451 Honors Thesis (special permission required)	3-4
☐	NEUR 461 Special Topics in Neuroscience (you may take up to 12 credits in different topics)	1-3
☐	NEUR 480 Biological Basis of Alzheimer's Disease	3
☐	PHYS 262 University Physics III [P]	3
☐	PHYS 263 University Physics III Laboratory [P]	1
☐	PSYC 304 Principles of Learning	4
☐	PSYC 309 Sensation, Perception, and Information Processing	4
☐	PSYC 317 Cognitive Psychology	3
☐	PSYC 441 Criminal Behavior: Psychological and Neurological Aspects	3
☐	PSYC 472 Current Topics in Brain and Behavior	3

The following courses have been pre-approved as neuroscience electives by the advising office, but are not currently listed in the catalog as electives. If you take one of these courses, please inform an advisor. The advisor will submit paperwork so the course shows properly in Degree Works.

- PSYC 461 Special Topics. NOTE: THIS IS ONLY APPROVED WHEN THE TOPIC IS:
    - Drugs and the Brain
    - Animal Cognition
    - Animal Behavior
    - Exploring Brain Health and Sickness in Books and Film
    - Disorders in the Brain
    - Psychology of Stress and Health
    - Neuronal Basis of Learning and Memory

4-Year Example Schedule (General)

B.S. Neuroscience

This degree requires 120 total credits. 45 of these credits must be upper level (300-level and above).

First Year

Fall	
Course	Credits
BIOL 103: Introductory Biology I*	3
CHEM 211: General Chemistry I	3
CHEM 213: General Chemistry I Lab	1
PSYC 100: Basic Concepts in Psychology	3
Mason Core (rec. Written Comm.- lower level)	3
UNIV 100	1
Total	14

Spring	
Course	Credits
BIOL 213: Cell Structure and Function	4
CHEM 212: General Chemistry II	3
CHEM 214: General Chemistry II lab	1
MATH Requirement**	3-4
NEUR 101: Introduction to Neuroscience*** OR Mason Core	3
Total	14-15

Second Year

Fall	
Course	Credits
PSYC 375: Brain and Sensory Processes	3
MATH Requirement**or Mason Core	3-4
Second Biology Course	3-4
Mason Core (rec. Oral Comm.)	3
Mason Core (rec. Literature)	3
Total	14-16

Spring	
Course	Credits
PSYC 376: Brain and Behavior	3
PSYC 373: Biopsychology Laboratory	2
Statistics	3-4
Mason Core (rec. Art, Glob. Con., or Global Hist.)	3
Mason Core (rec. Art, Glob. Con., or Global Hist.)	3
Total	14-15

Third Year

Fall	
Course	Credits
PHYS 243: College Physics I	3
PHYS 244: College Physics I Lab	1
NEUR 327: Cellular Neuroscience	3
NEUR 328: Cellular Neuroscience Lab	2
Mason Core (rec. Written Comm.- upper level)	3
Mason Core (rec. Art, Glob. Con., or Global Hist)	3
Total	14

Spring	
Course	Credits
PHYS 245: College Physics II	3
PHYS 246: College Physics II Lab	1
NEUR 335: Developmental and Systems Neuroscience	3
Mason Core (rec. Apex)	3
Neuroscience Elective****	3
General Elective	3
Total	16

Fourth Year

Fall	
Course	Credits
NEUR 411: Seminar in Neuroscience	3
CDS 130: Computing for Scientists	3
Neuroscience Elective****	3
Neuroscience Elective****	3
Neuroscience Elective****	3
Total	15

Spring	
Course	Credits
Neuroscience Elective****	3
Neuroscience Elective****	3
Neuroscience Elective****	3
Neuroscience Elective****	3
General Electives to get to 120 credits	3+
Total	15+

** MATH Requirement: Students must take MATH 113 OR MATH 123 & MATH 124 (2 semesters) for this degree. Students must take the math placement test (http://math.gmu.edu/placement_test.php) to determine which math they can enroll in. Depending on placement, students may have to take MATH 105 (Precalculus) before taking Calculus.

***NEUR 101 is not required for the major, but will count as a Neuroscience Elective if taken before 300-level PSYC and NEUR courses.

****22 credits of Neuroscience Electives are required for the major. See approved list of courses on page 7-8 and on the BS Neuroscience Catalog page

4-Year Example Schedule (Pre-Health)

B.S. Neuroscience

Track-A: For students who will take the MCAT/exams during the spring of the **third** year

This degree requires 120 total credits. 45 of these credits must be upper level (300-level and above).

First Year

Fall	
Course	**Credits**
BIOL 103: Intro to Cell Biology	3
CHEM 211: General Chemistry I	3
CHEM 213: General Chemistry I Lab	1
PSYC 100: Basic Concepts in Psychology	3
Mason Core (rec. Written Comm.- lower level)	3
UNIV 100	1
Total	14

Spring	
Course	**Credits**
BIOL 213: Cell Structure and Function	4
CHEM 212: General Chemistry II	3
CHEM 214: General Chemistry II lab	1
MATH Requirement**	3-4
NEUR 101: Introduction to Neuroscience*** OR Mason Core	3
Total	14-15

Second Year

Fall	
Course	**Credits**
PSYC 375: Brain and Sensory Processes	3
Mason Core (rec. Literature)	3
CHEM 313: Organic Chemistry I****	3
CHEM 315: Organic Chemistry I Lab****	2
PHYS 243: College Physics I	3
PHYS 244: College Physics I Lab	1
Total	15

Spring	
Course	**Credits**
PSYC 376: Brain and Behavior	3
PSYC 373: Biopsychology Laboratory	2
CHEM 314: Organic Chemistry II****	3
CHEM 318: Organic Chemistry II Lab****	2
PHYS 245: College Physics II	3
PHYS 246: College Physics II Lab	1
Total	14

Third Year

Fall	
Course	**Credits**
BIOL 311: Genetics	4
Statistics (STAT 250 or BIOL 214)	3-4
BIOL 430: Advanced Human Anat. and Phys. I****	4
BIOL 483: General Biochemistry****	4
Total	15-16

Spring	
Course	**Credits**
BIOL 431: Advanced Human Anat. and Phys. II****	4
NEUR 327: Cellular Neuroscience	3
NEUR 328: Cellular Neuroscience Lab	2
SOCI 101: Introductory Sociology	3
Mason Core (rec. Written Comm.- upper level)	3
Total	14

Fourth Year

Fall	
Course	**Credits**
NEUR 335: Developmental and Systems Neuroscience	3
CDS 130: Computing for Scientists	3
Mason Core (rec. Apex	3
Mason Core	3
Mason Core	3
Total	15

Spring	
Course	**Credits**
NEUR 411: Seminar in Neuroscience	3
Mason Core	3
Mason Core	3
Major Elective	3
General Electives to get to 120 credits	3+
Total	15+

** MATH Requirement: Students must take MATH 113 OR MATH 123 & MATH 124 (2 semesters) for this degree. Students must take the math placement test (http://math.gmu.edu/placement_test.php) to determine which math they can enroll in. Depending on placement, students may have to take MATH 105 (Precalculus) before taking Calculus.

***NEUR 101 is not required for the major, but will count as a Neuroscience Elective if taken before 300-level PSYC and NEUR courses.

****22 credits of Neuroscience Electives are required for the major. Many medical school prerequisites are accepted as neuroscience electives. Courses labeled "****" above are counted as neuroscience electives. See approved list of courses on page 7-8 and on the BS Neuroscience Catalog page

4-Year Example Schedule (Pre-Health)

B.S. Neuroscience

Track-B: For students who will take the MCAT/exams during the spring of the **fourth** year

This degree requires 120 total credits. 45 of these credits must be upper level (300-level and above).

First Year

Fall	
Course	Credits
BIOL 103: Introductory Biology I*	3
CHEM 211: General Chemistry I	3
CHEM 213: General Chemistry I Lab	1
PSYC 100: Basic Concepts in Psychology	3
Mason Core (rec. Written Comm.- lower level)	3
UNIV 100	1
Total	14

Spring	
Course	Credits
BIOL 213: Cell Structure and Function	4
CHEM 212: General Chemistry II	3
CHEM 214: General Chemistry II lab	1
MATH Requirement**	3-4
NEUR 101: Introduction to Neuroscience*** OR Mason Core	3
Total	14-15

Second Year

Fall	
Course	Credits
PSYC 375: Brain and Sensory Processes	3
BIOL 311: General Genetics	4
CHEM 313: Organic Chemistry I****	3
CHEM 315: Organic Chemistry I Lab****	2
MATH Requirement**or Mason Core	3-4
Total	15-16

Spring	
Course	Credits
PSYC 376: Brain and Behavior	3
PSYC 373: Biopsychology Laboratory	2
CHEM 314: Organic Chemistry II****	3
CHEM 318: Organic Chemistry II Lab****	2
Mason Core (rec. Literature)	3
Mason Core	3
Total	16

Third Year

Fall	
Course	Credits
PHYS 243: College Physics I	3
PHYS 244: College Physics I Lab	1
NEUR 327: Cellular Neuroscience	3
NEUR 328: Cellular Neuroscience Lab	2
BIOL 483: General Biochemistry****	4
Statistics (STAT 250 or BIOL 214)	3-4
Total	15-16

Spring	
Course	Credits
PHYS 245: College Physics II	3
PHYS 246: College Physics II Lab	1
NEUR 335: Developmental and Systems Neuroscience	3
Mason Core (rec. Written Comm.- upper level)	3
Mason Core	3
Mason Core	3
Total	16

Fourth Year

Fall	
Course	Credits
BIOL 430: Advanced Human Anat. and Phys. I****	4
BIOL 305: Biology of Microorganisms****	3
BIOL 306: Biology of Microorganisms Lab****	1
CDS 130: Computing for Scientists	3
SOCI 101: Introductory Sociology	3
Total	14

Spring	
Course	Credits
BIOL 431: Advanced Human Anat. and Phys. II****	4
NEUR 411: Seminar in Neuroscience	3
Mason Core (rec. Apex	3
Mason Core	3
General Electives to get to 120 credits	3+
Total	16+

** MATH Requirement: Students must take MATH 113 OR MATH 123 & MATH 124 (2 semesters) for this degree. Students must take the math placement test (http://math.gmu.edu/placement_test.php) to determine which math they can enroll in. Depending on placement, students may have to take MATH 105 (Precalculus) before taking Calculus.

***NEUR 101 is not required for the major, but will count as a Neuroscience Elective if taken before 300-level PSYC and NEUR courses.

****23 credits of Neuroscience Electives are required for the major. Many medical school prerequisites are accepted as neuroscience electives. Courses labeled "****" above are counted as neuroscience electives. See approved list of courses on page 7-8 and on the BS Neuroscience Catalog page

Schedule Recommendations

Core Sequence Recommendations

- Take the lower-level Written Communication Core (ENGH 100 or 101) as one of your first year Core courses
- Literature Core must be taken before upper-level Written Communication Core (ENGH 302)
- ENGH 302 should be taken in the junior or senior year, and should be completed before NEUR 411
- Synthesis Core should be taken in the junior or senior year

Psychology Course Sequence Recommendations

- Take PSYC 100 first
- Next, take PSYC 375
- Lastly, take PSYC 376 concurrently with PSYC 373
- If possible, take all required PSYC courses before taking 300-level NEUR courses

Neuroscience Course Sequence Recommendations

- Take the PSYC sequence (PSYC 375, 376 & 373) before starting the NEUR sequence (NEUR 327, NEUR 335)
- Take NEUR 327 before NEUR 335
- Take NEUR 411 in the junior or senior year, after you have completed the PSYC and/or NEUR course sequences and ENGH 302.

Neuroscience Electives

- 22 Neuroscience elective credits are required.
- Students who plan to apply to graduate programs, including the Accelerated M.S. Biology, should take Organic Chemistry I with Lab (CHEM 313 & 315) as one of their electives.
- See the list of pre-approved neuroscience electives in the course catalog at catalog.gmu.edu.
- Pre-health students who take the recommended courses above (CHEM 313, CHEM 315, CHEM 314, CHEM 318, BIOL 483, BIOL 430, BIOL 431, BIOL 305, and BIOL 306 = 25 credits) will satisfy the neuroscience elective requirement through with these courses. However, we recommend students take additional neuroscience-related elective courses as their schedule allows.
- Courses that are not on the pre-approved list below must be approved by the director of the program. If you would like to inquire about approval of a course not on the list, please e-mail an advisor at neurosci@gmu.edu.

Summer Courses

The BS program is designed so it can be completed without summer courses. However, taking summer courses can alleviate the course load during the fall and spring and free up room to take more electives. In general, *we do not advise students take pre-health required courses during the summer*. We recommend all students meet with an advisor to discuss summer coursework.

Placement Exams and Transfer Credit

Math Placement Test

Students must take MATH 113 or MATH 123/124 (2 semesters) for this degree. Students must take the math placement test (http://math.gmu.edu/placement_test.php) to determine if they can enroll directly into MATH 113 (Calculus I) or MATH 123 (Calculus I Part A). If you do not place directly into MATH 113 or 123, you will need to take MATH 105 (Precalculus).

No placement test is required if you received AP/IB/transfer credit for MATH 105 or higher. However, the credit must be approved by Admissions before you can register for a higher math.

Placement test information:

Website: http://math.gmu.edu/placement_test.php
E-mail Catherine Sausville at csausvil@gmu.edu with questions

Transfer Credit

Evaluation of Transfer Credit (All transfer credit information, including equivalency search):
http://admissions.gmu.edu/transfer/transferCreditEvaluation.asp

Academic Credit by Exam (All credit exam information, e.g.: AP/IB score information):
http://admissions.gmu.edu/exams/

Honors in Neuroscience

Students in the B.S. in Neuroscience program have the opportunity to graduate with honors in the major by completing an honors thesis. The honors program is a 3 semester program that culminates in the successful completion and presentation of an honors thesis, which is an independent research project. Students who are interested in completing an honors thesis should plan to take NEUR 410 or NEUR 411, the writing intensive requirement for the neuroscience major, in their junior year. Catalog information about the honors program can be found at catalog.gmu.edu.

Course Sequence

1. NEUR 410: Current Topics in Neuroscience or NEUR 411: Seminar in Neuroscience. These are the writing intensive courses for the neuroscience major.
2. NEUR 450: Honors Thesis Proposal
3. NEUR 451: Honors Thesis

Eligibility

To be eligible, students must have completed at least 60 credits, have a minimum cumulative GPA of 3.25, and a minimum GPA of 3.25 in neuroscience courses.

Selecting a Thesis Advisor

Thesis projects are completed under the supervision of a faculty member at Mason, who serves as the “thesis advisor.” Students must identify a faculty member who agrees to serve as the thesis advisor before applying to the program. We recommend that students begin research in a faculty member’s lab 1 or more semesters before they are planning to enroll in NEUR 450: Honors Thesis Proposal.

Students who are interested in doing research at Mason, and potentially completing an honors thesis, should identify faculty whose research aligns with their interests. Contact these faculty to set up a meeting and discuss available research opportunities in their labs. Neuroscience faculty research interests and contact information can be found on the faculty web page https://cos.gmu.edu/neuroscience/people/.

Applying to the Program

Students should apply to the program in the semester before they intend to enroll in NEUR 450. Follow the procedures below.

1. Get a verbal agreement from your thesis advisor to do the honors thesis.
2. E-mail the proposed thesis topic to the director of the B.S. in Neuroscience program, Saleet Jafri (sjafri@gmu.edu). Copy your thesis advisor on the e-mail.

Assembling a Committee and Enrolling

1. Once you have received confirmation of acceptance to the program, you should form a committee of 3 faculty who will evaluate your thesis. The committee will consist of the neuroscience director, your thesis advisor, and one additional neuroscience faculty member. We recommended that students discuss the selection of the additional faculty member with their thesis advisor. Once you have assembled your committee, send this information to the neuroscience director.

2. Enroll in NEUR 450: Honors Thesis Proposal. Enrolling in NEUR 450 requires an Individualized Section Form, which should be submitted to a neuroscience advisor.

Completing the Program

1. While enrolled in NEUR 450, you should work on preparing your honors thesis proposal. Specific proposal requirements should be discussed with your thesis advisor. At a minimum, proposals should include: a description of the project, preliminary studies, and approach. The proposal should be submitted to your thesis advisor for approval. Once approved, the proposal should be e-mailed to the director of the B.S. in Neuroscience program, Saleet Jafri (sjafri@gmu.edu). Copy your thesis advisor on the e-mail.
2. Once the director has accepted your proposal, you will enroll in NEUR 451: Honors Thesis. Enrolling in NEUR 451 requires an Individualized Section Form,
3. Requirements for the completion and presentation of the thesis in NEUR 451 should be discussed with your thesis advisor. Upon completion of NEUR 451, the completed thesis must be approved by both the thesis advisor and the program director.
4. To graduate with honors, students must earn a minimum GPA of 3.50 in their honors courses, maintain a minimum cumulative GPA of 3.25, and complete an honors thesis.

Research Opportunities

The Interdisciplinary Program in Neuroscience at Mason provides students with an abundance of opportunities to gain research experience.

Research Assistantships

The simplest way to begin gaining research experience is by volunteering as a research assistant in a lab at Mason. Typically, students begin seeking out research opportunities in their sophomore and junior years, but it is never too late. The best way to find available research opportunities is to:

1. Identify faculty whose research aligns with your interests. If they teach elective courses, consider enrolling in a course and getting to know them and their subject area. Neuroscience faculty research interests and contact information can be found on the faculty web page https://cos.gmu.edu/neuroscience/people. You may also consider doing research with a faculty member outside of the neuroscience program. Faculty in Psychology, Biology, Bioengineering, and other departments are all good options. Websites for some research centers and labs that may be of interest are listed below.

2. Contact faculty. It is ideal if you are able to approach or meet with faculty in person. If you are unable to meet with them in person, it is acceptable to reach out via-email. Keep e-mails brief, but include background about yourself and explain why you are interested in their lab. Demonstrate that you have read some of their research. Ask to set up a meeting and discuss available research opportunities in their labs.

Once you have established research in a laboratory, you may be able to earn credit for this research through an Independent Study, the Undergraduate Research Scholars Program (URSP) with OSCAR, or an Honors Thesis. These options should be discussed with your research mentor.

Research Centers and Labs

*This list is not exhaustive of the research opportunities at Mason!

Centers:

- Center for Adaptive Systems of Brain-Body Interactions (CASBBI) https://casbbi.gmu.edu/
- Center for Applied Proteomics and Molecular Medicine: http://capmm.gmu.edu/
- Center for Neural Informatics, Neural Structures, and Neural Plasticity (CN3): http://krasnow1.gmu.edu/cn3/
- Center for the Study of Neuroeconomics: http://www.neuroeconomics.us/website/

Labs:

- Arch Lab: http://archlab.gmu.edu/about.shtml
- Flinn Lab: http://psychfaculty.gmu.edu/flinn/
- Physiological & Behavioral Neuroscience in Juveniles (PBNJ) Lab: http://krasnow1.gmu.edu/pbnj/
- Kabbani Lab: http://krasnow.gmu.edu/kabbani/
- Fryxell Lab: http://mason.gmu.edu/~kfryxell/index.html
- Computational Neuroanatomy Group (CNG): http://krasnow1.gmu.edu/cn3/index3.html
- Neural Engineering Lab: http://neural.bioengineering.gmu.edu/ and http://nelab.onmason.com/
- Collaborative Undergraduate Neuroscience Lab: Collaboration between Drs. Greta Ann Herin (electrophysiology), Ren Guerriero (sleep), and Valerie Olmo (development).
- Complete Neuroscience Faculty List (w/ Research Bios): https://cos.gmu.edu/neuroscience/people

Internships and Programs

There are several internship opportunities that may be of interest to undergraduates, both within and outside Mason. For example:

- George Mason Aspiring Scientists Summer Internship Program (ASSIP): http://assip.cos.gmu.edu/
- Undergraduate Research Scholars Program (URSP): http://oscar.gmu.edu/students/
- Janelia Research Campus Undergraduate Scholars Program: https://www.janelia.org/you-janelia/students-postdocs/undergraduate-scholars-program
- NIH Summer Internship Program in Biomedical Science: https://www.training.nih.gov/programs/sip
- Georgetown Dean of Medical Education's Academy for Research, Clinical, and Health Equity Scholarship (ARCHES) program: https://som.georgetown.edu/guarches
- Neuroscience Seminar in Germany: http://blogs.cofc.edu/germanneuro/

Research and Scholarship Intensive Courses

The Interdisciplinary Program in Neuroscience offers several laboratory courses where students design and execute original scholarly research projects as part of the course. Many students present their projects as Mason's research symposiums and at regional and national meetings.

- NEUR 405: Laboratory Methods in Behavioral Neuroscience
- NEUR 407: Lab Investigations Using Voltage Clamp Electrophysiology

The Office of Student Scholarship, Creative Activities, and Research (OSCAR)

OSCAR supports undergraduate research in many ways, including through the Undergraduate Research Scholars Program (URSP), which provides funding and training for undergraduate researchers. They also offer travel grants, host a research celebration, and help connect students with mentors. Get more information here https://oscar.gmu.edu/students/.

Study Abroad Programs

Neuroscience and Technology in Germany (Planned for Summer 2026)

Beginning in summer 2022, the Neuroscience program led a 6-credit summer course in Germany. This program is intended for Sophomores - Seniors in neuroscience, biology, or bioengineering.

Program Description
The World Economic Forum ranks Germany as the most innovative country in the world. The best of German science, culture, and history awaits you in this three-week course that highlights visits to top-ranked universities and research institutes. You will be able to apply what you learned in your STEM courses to real-world applications. You'll be able to discuss the hottest Neuroscience and Technology research by speaking (in English) with the scientists themselves during these personal tours. We will visit the ancient castles such as where Hildegard von Bingen devised medicines and founded natural history in the 1100s and learn about the history of innovation including Gutenberg's first printed book from the 1450s. We will explore the cultural differences and similarities between living and "doing science" in Europe vs North America. We will prepare our STEM students for each visit with Mason faculty-led concept reviews and visit previews.

Mason Global Education Office

We encourage all neuroscience students to explore study abroad opportunities. Information about additional study abroad programs can be found through the Global Education Office https://studyabroad.gmu.edu/.

Careers in Neuroscience

Recommended Links
These websites are great resources to explore career options in neuroscience

- The Ohio State University Neuroscience Program https://neurosciencemajor.osu.edu/careers-neuroscience
- Princeton Neuroscience Institute https://pni.princeton.edu/undergraduate-concentration/careers-neuroscience

Academic Colleges and Universities
Professor positions may be more research oriented or more teaching oriented

Non-University Research Institutes
Howard Hughes Medical Institutes (HHMI): http://www.hhmi.org/
Janelia Research Campus—Local branch of HHMI: https://www.janelia.org/
Santa Fe Institute: http://www.santafe.edu/
Salk Institute: http://www.salk.edu/

Hospital Affiliated Research
INOVA Translational Medicine Institute: http://www.inova.org/itmi/home

Government Research
National Institutes of Health (NIH): http://nih.gov/
National Institute of Neurological Disorders and Stroke (NINDS): http://www.ninds.nih.gov/
National Institute on Drug Abuse: http://www.drugabuse.gov/
National Institute on Aging: http://www.nia.nih.gov/
National Institute of Mental Health: http://www.nimh.nih.gov/index.shtml

Military Research
DARPA: http://www.darpa.mil/Our_Work/BTO/Programs/
Office of Naval Research (ONR): http://www.onr.navy.mil
Army Research Lab (ARL): http://www.arl.army.mil/www/default.cfm
Air Force Research Lab (AFRL): http://www.wpafb.af.mil/AFRL/

Pharmaceutical Companies
Pfizer: http://pfizercareers.com/
Roche: http://www.rocheusa.com/portal/usa/careers Johnson & Johnson: http://careers.jnj.com/
Merck: http://www.merck.com/index.html

Biotechnology Companies
Life Technologies: http://www.lifetechnologies.com/us/en/home.html Bio-Rad: http://www.bio-rad.com/
Illumina: https://www.illumina.com/
Tech Companies
IBM: http://www.ibm.com/us/en/
Northrop Grumman: http://www.northropgrumman.com/Pages/default.aspx

Advice to Mason Neuroscience Students

1. Check your degree status: http://registrar.gmu.edu/students/degree-evaluation/
2. GPA matters! A 3.5 GPA or above is considered competitive for graduate and medical schools.
3. Recommendation Letters: Get to know faculty! Connect with them early and often. Make sure they know you well so they can provide strong, positive recommendation letters for your next steps.
4. Become familiar with PubMed: http://www.ncbi.nlm.nih.gov/pubmed/
5. Top Neuroscience Journals:
   - Nature: http://www.nature.com/nature/index.html
   - Cell: http://www.cell.com/
   - Science: http://www.sciencemag.org/
   - Neuron: http://www.cell.com/neuron/
   - Journal of Neuroscience: http://www.jneurosci.org/
   - Nature Neuroscience: http://www.nature.com/neuro/index.html
   - Nature Reviews Neuroscience: http://www.nature.com/nrn/index.html
6. Article Access:
   - GMU E-journal finder: http://library.gmu.edu/phpzone/ej.php
   - D.C. Region Loan: https://www.aladin.wrlc.org/Z-WEB/Aladin?req=main c.
   - Interlibrary Loan: https://gmu.illiad.oclc.org/illiad/VGM/logon.html
7. Recommended Podcasts:
   - Nature Podcast: http://www.nature.com/nature/podcast/
   - Neuropod: http://www.nature.com/neurosci/neuropod/index.html
   - Nature Medicine Podcast: http://www.nature.com/nm/podcast/index/html
   - Science Podcast: http://www.sciencemag.org/site/multimedia/podcast/
   - Cell Podcast: https://itunes.apple.com/podcast/cell-podcast/id207189884?mt=2
   - Radiolab: http://www.radiolab.org/archive/
8. Recommended Blog: http://www.sciencedaily.com/
9. Neuroscience Resources:
   - Society for Neuroscience: http://www.sfn.org/
   - Allen Brain Atlas: http://www.brain-map.org/
10. Writing a professional email: https://www.training.nih.gov/writing_professional_e-mail
11. Satisfactory Academic Progress Policy (for Financial Aid): http://financialaid.gmu.edu/satisfactory-academic-progress-sap/
12. If you have any questions, please contact the Neuroscience Advisor at neurosci@gmu.edu