

# BIOLOGY, MS

Banner Code: SC-MS-BIOL

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This program provides advanced training for college graduates or professionals seeking careers in the biomedical research, biotechnology, neuroscience or biodefense, as well as evolutionary and animal biology, animal biology and biology teaching. Master's level concentrations are available in microbiology and infectious disease, molecular biology, neuroscience, evolutionary biology, and translational and clinical research. Alternatively, students may choose the program in general biological sciences, which allows flexibility to build a degree program tailored to a specific research or career interest.

## Admissions & Policies

### Admissions

University-wide admissions policies can be found in the Graduate Admissions Policies (<http://catalog.gmu.edu/admissions/graduate-policies/>) section of this catalog.

To apply for this program, please complete the George Mason University Admissions Application (<https://www2.gmu.edu/admissions-aid/apply-now/>).

While each applicant's qualifications are reviewed as a whole, the following are required: Applicants to the program must have a bachelor's degree in biology or other relevant fields from an institution of higher education accredited by a Mason-recognized U.S. institutional accrediting agency or international equivalent. Additionally, all MS concentrations require a GPA of 3.00 in biology coursework or in the last 60 credits of undergraduate study.

Prospective students should supply a copy of official transcripts from each college and graduate institution attended, a current résumé, and an expanded goals statement. Applicants should also include two letters of recommendation. TOEFL or IELTS scores are required for all international applicants.

Previous research experience or relevant employment is a plus. Admission is contingent on acceptance by a faculty research advisor.

The GRE is not required for admission into this program.

### Evolutionary Biology (EB) Concentration

Students who choose the Evolutionary Biology concentration must also submit a personal statement/statement of interest consistent with at least one faculty member's research program.

### Microbiology and Infectious Disease (MID) Concentration

Students who choose the Microbiology and Infectious Disease concentration must have a lecture and lab course in microbiology and a lecture course in biochemistry.

### Policies

For policies governing all graduate programs, see AP.6 Graduate Policies (<http://catalog.gmu.edu/policies/academic/graduate-policies/>).

## Requirements

### Degree Requirements

Total credits: 30

Students should refer to the Admissions & Policies tab for specific policies related to this program.

Candidates for the Biology, MS must complete the Core Courses and may choose one concentration or the MS without concentration requirements, detailed below, for a total of 30 credits (minimum).

### Program of Study

The faculty advisor and the student work together to develop a program of study that best fits the student's background and interests. The student must submit a program of study to the program director for approval within the first 12 credits of coursework. By the end of the second semester of coursework, students will form a graduate committee made up of three faculty members. At least two committee members must be full-time faculty in the School of Systems Biology (<http://catalog.gmu.edu/colleges-schools/science/systems-biology/>).

Students must complete all core courses and choose one concentration option:

### Core Courses

Code	Title	Credits
<b>Cell and Molecular Requirement</b>		<b>3</b>
BIOL 682	Advanced Eukaryotic Cell Biology	
or BIOS 744	Molecular Genetics	
<b>Professional Methods Requirement</b>		<b>4</b>
BIOL 690	Introduction to Graduate Studies in Biology	
Choose one from the following:		
BIOL 689	Interdisciplinary Tools in the Biosciences	
BIOL 691	Current Topics in Biology <sup>1</sup>	
or BIOS 702	Research Methods	
NEUR 702	Research Methods	
<b>Seminar Requirement</b>		<b>3</b>
Select a total of 3 credits from the following courses:		
BIOL 692	Seminar in Biology (may be repeated) <sup>2</sup>	
BIOL 695	Seminar in Molecular, Microbial, and Cellular Biology (may be repeated) <sup>3</sup>	
<b>Systems Biology/Evolution Requirement</b>		<b>3</b>

BIOL 502	Adaptation in Biosystems	
<b>Research Requirement</b>		<b>2-6</b>

Students have the option to complete a 2-3 credit research project (BIOL 798 Master's Research Project) or a 3-5 credit master's thesis (BIOL 799 Thesis). In accordance with AP.6 Graduate Policies, the same quality of work is expected of students regardless of which option they choose.

**Research Project:** The MS project is most appropriate for students who have scheduling commitments, such as a full-time job, that may preclude performing a complete series of laboratory experiments. Students pursuing the project option must successfully complete written and oral comprehensive exams. Additionally, students should present their research orally or as a poster to a community outside of the classroom, at Mason conferences or at external conferences.

**Thesis:** In general, the MS thesis is most appropriate for students planning or considering a research career. Students pursuing the thesis option must write a formal thesis that meets the requirements of the school and must defend their thesis and present their results in a public seminar.

#### Select a Research Project or a Master's Thesis

BIOL 798	Master's Research Project (2-3 credits)	
BIOL 799	Thesis (3-5 credits)	
<b>Total Credits</b>		<b>15-19</b>

- When the topic is "Research Methods," or "Creativity and Innovation".
- May be taken up to two times in this program under different topics.
- May be taken up to six times in this program under different topics.

## MS without Concentration

Code	Title	Credits
<b>General Coursework</b>		<b>12</b>

In consultation with an advisor, select at least 12 credits of graduate coursework from BIOL, BIOS, BMED, or NEUR-prefixed courses. Suggestions include:

BIOL 508	Selected Topics in Animal Biology <sup>1</sup>	
BIOL 553	Advanced Topics in Immunology	
BIOL 566	Cancer Genomics	
BIOL 568	Advanced Topics in Molecular Genetics	
BIOL 575	Selected Topics in Genetics	
BIOL 579	Molecular Evolution and Conservation Genetics	
BIOL 583	General Biochemistry	
BIOL 585	Eukaryotic Cell Biology Laboratory	
BIOL 667	Signal Transduction in Cancer	
BIOL 693	Directed Studies in Biology <sup>2</sup>	
or BINF 795	Bioinformatics Internship	
BIOL 793	Research in Biology	
BIOS 740	Laboratory Methods in Functional Genomics and Biotechnology	
BIOS 741	Genomics	
BIOS 742	Biotechnology	
BIOS 743	Genomics, Proteomics, and Bioinformatics	

BIOS 744	Molecular Genetics	
BIOS 767	Molecular Evolution	
BMED 604	Fundamentals of Human Physiology <sup>3</sup>	
<b>Total Credits:</b>		<b>30</b>

- Suggested section topics: "Research and Development in a Biotechnology Company," "Biology of Obesity and Weight Loss," "Human Anatomy," or "Medical Biochemistry". Other relevant topics may only be applied toward the degree with advisor approval.
- No more than 3 credits of directed study or internship can be applied.
  - Topics should be relevant and approved by the program director.
- Course is only available for students also enrolled in the Advanced Biomedical Sciences Graduate Certificate (<http://catalog.gmu.edu/colleges-schools/science/advanced-biomedical-sciences-graduate-certificate/>).

## Concentration in Evolutionary Biology (EB)

Code	Title	Credits
<b>Populations and Species</b>		<b>3-6</b>

Select 3-6 credits from the following:

BIOL 574	Population Genetics	
BIOL 579	Molecular Evolution and Conservation Genetics	
or BIOS 767	Molecular Evolution	
BIOL 648	Population Ecology	
BIOL 691	Current Topics in Biology	

<b>Organismal Biology</b>		<b>3-6</b>
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Select 3-6 credits from the following:

BIOL 501	Microbial Diversity: An Organismal Approach	
BIOL 507	Selected Topics in Ecology	
BIOL 508	Selected Topics in Animal Biology	
BIOL 518	Conservation Biology	
BIOL 528	Planetary Health	
BIOL 532	Animal Behavior	
BIOL 533	Selected Topics in Plant Biology	
BIOL 537	Ornithology	
BIOL 538	Mammalogy	
BIOL 539	Herpetology	
BIOL 543	Tropical Ecosystems	
BIOL 559	Fungi and Ecosystems	
BIOL 566	Cancer Genomics	
BIOL 581	Estuarine and Coastal Ecology	
BIOL 582	Estuarine and Coastal Ecology Laboratory	
BIOL 643	Microbial Ecology	
EVPP 536	The Diversity of Fishes	

<b>Molecular Techniques</b>		<b>3-4</b>
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Select 3-4 credits from the following:

BIOL 693	Directed Studies in Biology <sup>1</sup>	
or BINF 795	Bioinformatics Internship	
BINF 630	Bioinformatics Methods	
BIOS 716	Methods in Evolutionary Biology	
EVPP 515	Molecular Environmental Biology I	
EVPP 615	Molecular Environmental Biology II	

**Electives** 2-6

If needed in order to reach a total of 30 credits, select from the following courses:<sup>2</sup>

BIOL 693	Directed Studies in Biology <sup>1</sup>
or BINF 795	Bioinformatics Internship
BIOS 741	Genomics

Any additional course listed in the Core Courses section

**Total Credits:** 30

- <sup>1</sup>
- No more than 3 credits of directed study or internship can be applied to this concentration.
  - Topics should be relevant to the concentration and should be approved by the program director.

- <sup>2</sup> Other relevant graduate-level coursework may be selected in consultation with the advisor.

### Concentration in Microbiology and Infectious Disease (MID)

Code	Title	Credits
<b>Microbiology and Infectious Diseases</b>		<b>12</b>

In consultation with an advisor, select 12 credits from the following:

BINF 739	Topics in Bioinformatics <sup>1</sup>
BIOL 553	Advanced Topics in Immunology
BIOL 563	Virology
BIOL 685	Emerging Infectious Diseases
BIOL 693	Directed Studies in Biology <sup>2</sup>
BIOL 669	Pathogenic Microbiology
BIOL 715	Microbial Physiology

**Electives** 0-3

If needed to reach a total of 30 credits, select from the following courses:

BIOL 508	Selected Topics in Animal Biology <sup>3</sup>
BIOL 560	Infectious Diseases of Wildlife
BIOL 564	Techniques in Virology
BIOL 583	General Biochemistry
BIOL 718	Techniques in Microbial Pathogenesis
BIOS 742	Biotechnology
Any additional course listed in the Core Courses section	

**Total Credits:** 30

- <sup>1</sup> When the topic is "Computational Analysis: Viral Genomes".
- <sup>2</sup>
- No more than 3 credits of directed study can be applied to this concentration.
  - Topics should be relevant to the concentration and should be approved by the program director.
- <sup>3</sup> When the topic is "Water and Disease".

### Concentration in Molecular Biology (MOB)

Code	Title	Credits
<b>Molecular Biology</b>		<b>12</b>

In consultation with an advisor, select 12 credits from the following:

BIOL 508	Selected Topics in Animal Biology <sup>1</sup>
or BIOL 583	General Biochemistry

BIOL 568	Advanced Topics in Molecular Genetics
BIOL 579	Molecular Evolution and Conservation Genetics
or BIOS 767	Molecular Evolution
BIOL 580	Computer Applications for the Life Sciences
or BINF 630	Bioinformatics Methods
BIOL 583	General Biochemistry
BIOL 585	Eukaryotic Cell Biology Laboratory
BIOL 678	Cell-Based Assays
BIOL 693	Directed Studies in Biology <sup>2</sup>
or BINF 795	Bioinformatics Internship
BIOS 701	Systems Biology
BIOS 716	Methods in Evolutionary Biology
BIOS 742	Biotechnology
or BINF 633	Molecular Biotechnology
BINF 739	Topics in Bioinformatics
NEUR 651	Molecular Neuropharmacology

**Electives** 0-3

If needed to reach a total of 30 credits, select from the following courses:

BINF 641	Biomolecular Modeling
BIOL 693	Directed Studies in Biology <sup>2</sup>
or BINF 795	Bioinformatics Internship
BIOS 741	Genomics
NEUR 592	Special Topics in Neuroscience <sup>3</sup>
or NEUR 689	Topics in Neuroscience
CHEM 564	General Biochemistry II
CHEM 660	Protein Biochemistry
Any additional course listed in the Core Courses section	

**Total Credits:** 30

- <sup>1</sup> When the topic is "Research and Development in a Biotechnology Company," or "Medical Biochemistry".
- <sup>2</sup>
- No more than 3 credits of directed study or internship can be applied to this concentration.
  - Topics should be relevant to the concentration and should be approved by the program director.
- <sup>3</sup> When the topic is "Glutamatergic Systems".

### Concentration in Neuroscience (NEUR)

Code	Title	Credits
<b>Statistics</b>		<b>3</b>

Select 3 credits from the following:

BINF 530	Introduction to Bioinformatics Methods
BINF 630	Bioinformatics Methods
BINF 702	Biological Data Analysis
BIOL 691	Current Topics in Biology <sup>1</sup>
STAT 535	Analysis of Experimental Data
STAT 544	Applied Probability
STAT 554	Applied Statistics I

**Neurobiology** 9

In consultation with an advisor, select 9 credits from the following, at least 6 of which must be in NEUR-prefixed courses:

BIOL 508	Selected Topics in Animal Biology <sup>2</sup>
BIOL 568	Advanced Topics in Molecular Genetics <sup>3</sup>
BIOL 693	Directed Studies in Biology <sup>4</sup>
or BINF 795	Bioinformatics Internship
NEUR 592	Special Topics in Neuroscience
NEUR 601	Developmental Neuroscience
NEUR 602	Cellular Neuroscience
NEUR 603	Mammalian Neuroanatomy
NEUR 612	Neuroethics
NEUR 621	Synaptic Plasticity
NEUR 634	Neural Modeling
NEUR 651	Molecular Neuropharmacology
NEUR 689	Topics in Neuroscience (any topic is allowed; may be repeated)
NEUR 701	Neuroscience Laboratory
NEUR 709	Neuroscience Seminars
NEUR 710	Special Topics in Neuroscience
NEUR 734	Computational Neurobiology
NEUR 741	Introduction to Neuroimaging

**Electives** **0-3**

If needed to reach a total of 30 credits, select from the following:

BIOL 583	General Biochemistry
BIOL 691	Current Topics in Biology <sup>5</sup>
or BIOS 743	Genomics, Proteomics, and Bioinformatics
BIOL 693	Directed Studies in Biology <sup>4</sup>
or BINF 795	Bioinformatics Internship
Any additional NEUR-prefixed course at the 500-700 levels	
Other relevant graduate-level coursework may be selected in consultation with the advisor	
<b>Total Credits:</b>	<b>30</b>

- <sup>1</sup> When the topic is "MATLAB for Brain, Biological, and Cognitive Scientists".
- <sup>2</sup> When the topic is "Biology of Obesity and Weight Loss".
- <sup>3</sup> When the topic is "Epigenetics".
- <sup>4</sup>
  - No more than 3 credits of directed study or internship can be applied to this concentration.
  - Topics should be relevant to the concentration and should be approved by the program director.
- <sup>5</sup> When the topic is "Genomics, Proteomics, and Bioinformatics".

### Concentration in Nutrition Genetics and Nutraceuticals (NGN)

Code	Title	Credits
<b>Nutrition</b> <span style="float: right;"><b>6</b></span>		
In consultation with an advisor, choose 6 credits from the following:		
BIOL 508	Selected Topics in Animal Biology <sup>1</sup>	
NUTR 522	Nutrition Across the Lifespan	
NUTR 642	Macronutrients	

NUTR 670	Nutrition Research Methods
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**Human Diseases** **6**

In consultation with an advisor, choose 6 credits from the following:

BIOL 566	Cancer Genomics
BIOL 666	Human Genetics Concepts for Health Care
BIOS 743	Genomics, Proteomics, and Bioinformatics

**Electives**

If needed to reach a total of 30 credits, select from the following courses:

BIOL 508	Selected Topics in Animal Biology <sup>2</sup>
BIOL 562	Personalized Medicine
BIOL 568	Advanced Topics in Molecular Genetics
BIOL 583	General Biochemistry
BIOL 693	Directed Studies in Biology <sup>3</sup>
or BINF 795	Bioinformatics Internship
CHEM 564	General Biochemistry II
Any additional course listed in the Core Courses section	

**Total Credits** **30**

- <sup>1</sup> When the topic is "Biology of Obesity and Weight Loss," or "Medical Biochemistry".
- <sup>2</sup> When the topic is "Research and Development in Biotechnology Companies".
- <sup>3</sup>
  - No more than 3 credits of directed study or internship can be applied to this concentration.
  - Topics should be relevant to the concentration and should be approved by the program director.

### Concentration in Translational and Clinical Research (TCR)

Code	Title	Credits
<b>Translational and Clinical Research</b> <sup>1</sup>		<b>12</b>

In consultation with an advisor, select 12 credits from the following:

BIOL 508	Selected Topics in Animal Biology <sup>2</sup>
BIOL 562	Personalized Medicine
BIOL 566	Cancer Genomics
BIOL 666	Human Genetics Concepts for Health Care
BIOL 667	Signal Transduction in Cancer
BIOL 691	Current Topics in Biology <sup>3</sup>
or BIOS 743	Genomics, Proteomics, and Bioinformatics
BIOL 693	Directed Studies in Biology <sup>4</sup>
or BINF 795	Bioinformatics Internship
BMED 603	Cell Biology and Microscopic Anatomy <sup>5</sup>
BMED 604	Fundamentals of Human Physiology <sup>5</sup>
BMED 605	Introduction to Human Anatomy <sup>5</sup>

**Electives** **0-3**

If needed to reach a total of 30 credits, select from the following courses:

BIOL 508	Selected Topics in Animal Biology <sup>6</sup>
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BIOL 568	Advanced Topics in Molecular Genetics
BIOL 693	Directed Studies in Biology <sup>4</sup>
or BINF 795	Bioinformatics Internship
BIOS 741	Genomics
Any additional course listed in the Core Courses section	
Other relevant graduate-level coursework may be selected in consultation with the advisor	
<b>Total Credits:</b>	<b>30</b>

- For students concurrently enrolled in the Advanced Biomedical Sciences Graduate Certificate (<http://catalog.gmu.edu/colleges-schools/science/advanced-biomedical-sciences-graduate-certificate/>), contact your advisor for details regarding:
  - BMED course credit that may be counted towards this concentration
  - Meeting the requirements for graduate certificates and for master's degrees
- When the topic is "Research and Development in a Biotechnology Company," "Biology of Obesity and Weight Loss," or "Medical Biochemistry".
- When the topic is "Genomics/Proteomics/Bioinformatics".
- No more than 3 credits of directed study or internship can be applied to this concentration.
  - Topics should be relevant to the concentration and should be approved by the program director.
- Course is only available for students enrolled in the Advanced Biomedical Sciences Graduate Certificate (<https://catalog.gmu.edu/colleges-schools/science/advanced-biomedical-sciences-graduate-certificate/>).
- When the topic is "Research and Development in a Biotechnology Company".

(<http://catalog.gmu.edu/policies/academic/registration-attendance/#text>).

## Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Graduate Admission Policies (<http://catalog.gmu.edu/admissions/graduate-policies/>) section of this catalog.

Important application information and processes for this accelerated master's program can be found here (<https://www2.gmu.edu/admissions-aid/how-apply/accelerated-masters/>).

Students should seek out the graduate program's advisor who will aid in choosing the appropriate graduate courses and help prepare the student for graduate studies.

Three letters of recommendation, including one from a prospective thesis or project advisor, are required.

GRE scores are not required for students in this accelerated program.

Successful applicants will have an overall undergraduate GPA of at least 3.10. Additionally, they will have completed the following courses with a GPA of 3.00 or higher<sup>2</sup>:

Code	Title	Credits
BIOL 213	Cell Structure and Function	4
BIOL 214	Biostatistics for Biology Majors	4
BIOL 300 or BIOL 311	BioDiversity <sup>1</sup> General Genetics	4
CHEM 313 & CHEM 315	Organic Chemistry I and Organic Chemistry Lab I <sup>2</sup>	5

<sup>1</sup> Students should speak with an advisor to choose the course most appropriate for their post-graduation goals.

<sup>2</sup> Grades of 2.50 in CHEM 313 and CHEM 315 are acceptable for admission into this accelerated pathway.

## Accelerated Option Requirements

After the completion of 75 undergraduate credits, students may complete 3 to 12 credits of graduate coursework that can apply to both the undergraduate and graduate degrees.

In addition to applying to graduate from the undergraduate program, students in the accelerated program must submit a bachelor's/accelerated master's transition form (available from the Office of the University Registrar (<https://registrar.gmu.edu/forms/>)) to the College of Science's Office of Academic and Student Affairs (<https://cos.gmu.edu/about/contact-us/>) by the last day to add classes of their final undergraduate semester. Students should enroll for courses in the master's program in the fall or spring semester immediately following conferral of the bachelor's degree, but should contact an advisor if they would like to defer up to one semester.

Students must maintain an overall GPA of 3.00 or higher in all graduate coursework and should consult with their faculty advisor to coordinate their academic goals.

## Reserve Graduate Credit

Accelerated master's students may also take up to 6 graduate credits as reserve graduate credits. These credits do not apply to the undergraduate

## Accelerated Master's

### Biology, BS/Biology, Accelerated MS

#### Overview

This bachelor's/accelerated master's degree program allows academically strong undergraduates with a commitment to advance their education to obtain both the Biology, BS (<http://catalog.gmu.edu/colleges-schools/science/biology/biology-bs/>) and the Biology, MS degrees within an accelerated timeframe. Upon completion of this 138 credit accelerated program, students will be exceptionally well prepared for entry into their careers or into a doctoral program in the field or in a related discipline.

Students are eligible to apply for this accelerated program once they have earned at least 60 undergraduate credits and can enroll in up to 18 credits of graduate coursework after successfully completing 75 undergraduate credits. This flexibility makes it possible for students to complete a bachelor's and a master's in five years.

For more detailed information, see AP.6.7 Bachelor's/Accelerated Master's Degrees (<http://catalog.gmu.edu/policies/academic/graduate-policies/#ap-6-7>). For policies governing all graduate degrees, see AP.6 Graduate Policies (<http://catalog.gmu.edu/policies/academic/graduate-policies/>). For more information on undergraduates enrolling in graduate courses, see AP.1.4.4 Graduate Course Enrollment by Undergraduates

degree, but will reduce the master's degree by up to 6 credits. With 12 graduate credits counted toward the undergraduate and graduate degrees plus the maximum 6 reserve graduate credits, the credits necessary for the graduate degree can be reduced by up to 18.

## Graduate Course Suggestions

The following list of suggested courses is provided for general reference. To ensure an efficient route to graduation and post-graduation readiness, students are strongly encouraged to meet with an advisor before registering for graduate-level courses.

Code	Title	Credits
BIOL 508	Selected Topics in Animal Biology (When the topic is "Research and Development in a Biotechnological Company")	1-4
BIOL 682	Advanced Eukaryotic Cell Biology	3
BIOL 689	Interdisciplinary Tools in the Biosciences	3
BIOL 690	Introduction to Graduate Studies in Biology	1-2
BIOL 695	Seminar in Molecular, Microbial, and Cellular Biology	1

## Neuroscience, BS/Biology, Accelerated MS

### Overview

This bachelor's/accelerated master's degree program allows academically strong undergraduates with a commitment to advance their education to obtain both the Neuroscience, BS (<http://catalog.gmu.edu/colleges-schools/science/neuroscience-program/neuroscience-bs/>) and the Biology, MS (<https://catalog.gmu.edu/colleges-schools/science/systems-biology/biology-ms/>) degrees within an accelerated timeframe. Upon completion of this 138 credit accelerated program, students will be exceptionally well prepared for entry into their careers or into a doctoral program in the field or in a related discipline.

Students are eligible to apply for this accelerated program once they have earned at least 60 undergraduate credits and can enroll in up to 18 credits of graduate coursework after successfully completing 75 undergraduate credits. This flexibility makes it possible for students to complete a bachelor's and a master's in five years.

For more detailed information, see AP.6.7 Bachelor's/Accelerated Master's Degrees (<http://catalog.gmu.edu/policies/academic/graduate-policies/#ap-6-7>). For policies governing all graduate degrees, see AP.6 Graduate Policies (<http://catalog.gmu.edu/policies/academic/graduate-policies/>). For more information on undergraduates enrolling in graduate courses, see AP.1.4.4 Graduate Course Enrollment by Undergraduates (<https://catalog.gmu.edu/policies/academic/registration-attendance/#text>).

### Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Graduate Admission Policies (<http://catalog.gmu.edu/admissions/graduate-policies/>) section of this catalog.

Important application information and processes for this accelerated master's program can be found here (<https://www2.gmu.edu/admissions-aid/how-apply/accelerated-masters/>).

Students should seek out the graduate program's advisor who will aid in choosing the appropriate graduate courses and help prepare the student for graduate studies.

GRE scores are not required for students in this accelerated program.

Students must obtain a graduate faculty advisor prior to beginning graduate coursework.

Successful applicants will have an overall undergraduate GPA of at least 3.10. Two letters of recommendation, including one from a prospective thesis or project advisor, are required. Additionally, they will have completed<sup>2</sup> the following courses with a GPA of 3.00<sup>1</sup> or higher:

Code	Title	Credits
BIOL 213	Cell Structure and Function	4
One Course in Statistics:		3-4
BIOL 214	Biostatistics for Biology Majors	
or STAT 250	Introductory Statistics I (Mason Core) ( <a href="http://catalog.gmu.edu/mason-core/">http://catalog.gmu.edu/mason-core/</a> )	
or PSYC 300	Statistics in Psychology	
or MATH 352	Statistics	
BIOL 311	General Genetics	4
CHEM 313	Organic Chemistry I	5
& CHEM 315	and Organic Chemistry Lab I <sup>1</sup>	
NEUR 327	Cellular Neuroscience <sup>2</sup>	3

<sup>1</sup> Grades of 2.50 in CHEM 313 Organic Chemistry I and CHEM 315 Organic Chemistry Lab I are acceptable for admission into this accelerated pathway.

<sup>2</sup> Registration in, as opposed to completion of, NEUR 327 Cellular Neuroscience is sufficient.

### Accelerated Option Requirements

After the completion of 75 undergraduate credits, students may complete 3 to 12 credits of graduate coursework that can apply to both the undergraduate and graduate degrees.

In addition to applying to graduate from the undergraduate program, students in the accelerated program must submit a bachelor's/accelerated master's transition form (available from the Office of the University Registrar (<https://registrar.gmu.edu/forms/>)) to the College of Science's Office of Academic and Student Affairs (<https://cos.gmu.edu/about/contact-us/>) by the last day to add classes of their final undergraduate semester. Students should enroll for courses in the master's program in the fall or spring semester immediately following conferral of the bachelor's degree, but should contact an advisor if they would like to defer up to one semester.

Students must maintain an overall GPA of 3.00 or higher in all graduate coursework and should consult with their faculty advisor to coordinate their academic goals.

### Reserve Graduate Credit

Accelerated master's students may also take up to 6 graduate credits as reserve graduate credits. These credits do not apply to the undergraduate degree, but will reduce the master's degree by up to 6 credits. With 12 graduate credits counted toward the undergraduate and graduate degrees plus the maximum 6 reserve graduate credits, the credits necessary for the graduate degree can be reduced by up to 18.

## Graduate Course Suggestions

The following list of suggested courses is provided for general reference. To ensure an efficient route to graduation and post-graduation readiness, students are strongly encouraged to meet with an advisor before registering for graduate-level courses.

<b>Code</b>	<b>Title</b>	<b>Credits</b>
BIOL 682	Advanced Eukaryotic Cell Biology	3
BIOL 689	Interdisciplinary Tools in the Biosciences	3
BIOL 690	Introduction to Graduate Studies in Biology	1-2
BIOL 695	Seminar in Molecular, Microbial, and Cellular Biology	1
NEUR 612	Neuroethics	3
NEUR 601	Developmental Neuroscience	3
NEUR 602	Cellular Neuroscience	3
NEUR 603	Mammalian Neuroanatomy	3
NEUR 634	Neural Modeling	3
NEUR 651	Molecular Neuropharmacology	3