BIOLOGY, MASTER OF SCIENCE (M.S.)

Program goals
The Department of Biology prepares graduate students to:
1. Acquire training in a chosen subdiscipline of biology
2. Learn research techniques used in the subdiscipline
3. Develop presentation skills
4. Develop publication skills

Student learning outcomes
Upon completion of the M.S. in Biology, students will:
1. Demonstrate knowledge of a chosen subfield, including the most recent advances in research
2. Apply appropriate research techniques (i.e., field or lab)
3. Effectively communicate research and findings in a professional context
4. Effectively write papers for publication

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs
The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website (http://www.graduate.vcu.edu) and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Other information

Apply online at graduate.admissions.vcu.edu (http://www.graduate.admissions.vcu.edu).

Admission requirements

<table>
<thead>
<tr>
<th>Degree</th>
<th>Semester(s) of entry</th>
<th>Deadline dates</th>
<th>Test requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>M.S.</td>
<td>Fall</td>
<td>Jan 15</td>
<td>GRE</td>
</tr>
<tr>
<td></td>
<td>Spring and summer</td>
<td>By special permission of graduate director</td>
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</tbody>
</table>

In addition to the general admission requirements of the VCU Graduate School (http://bulletin.vcu.edu/graduate/study/admission-graduate-study/admission-requirements), the following requirements represent the minimum acceptable standards for admission:
1. Bachelor’s degree in biological or related science or equivalent
2. Appropriate college-level background in mathematics, chemistry and physics
3. Three letters of recommendation pertaining to the applicant’s potential ability as a graduate student in biology
4. Student’s written statement concerning career and research interests
5. Transcripts of all previous college work
6. Satisfactory scores on the GRE (general test)

Degree requirements
In addition to general VCU Graduate School graduation requirements (http://bulletin.vcu.edu/academic-regs/grad/graduation-info), students are required to complete course work in core and elective courses and to conduct significant research.

1. Credit hour requirements: Master of Science degree candidates are required to take a minimum of 30 graduate credit hours. A maximum of six credit hours from graduate course work taken at other institutions may be transferred if they meet approval of the department.
2. Grade requirements: Receipt of a grade of C or lower in two courses constitutes automatic dismissal from the graduate program in biology. Courses with a grade of C or lower cannot be applied to satisfying the degree requirements.

3. Other requirements: All graduate students are required to write a thesis proposal and a formal thesis following a prescribed format. In order to initiate thesis research, the thesis proposal must be approved by the student’s graduate committee and the chair of the department, and the student must be approved for degree candidacy. Each student will be required to pass a final examination, which will be primarily a defense of the thesis. Students may specialize within many areas, such as molecular and cellular biology, genetics, aquatic and terrestrial ecology, systematics, physiology, neurobiology and developmental biology. Students also may develop an interdisciplinary focus to their degree programs, for example, within areas such as bioinformatics, cancer biology, forensic science and environmental science.

**Curriculum requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOL 693</td>
<td>Current Topics in Biology</td>
<td>2</td>
</tr>
<tr>
<td>BIOL 698</td>
<td>Thesis</td>
<td>6</td>
</tr>
<tr>
<td>BIOS 543</td>
<td>Graduate Research Methods I (^1)</td>
<td>3</td>
</tr>
<tr>
<td>or STAT 543</td>
<td>Statistical Methods I</td>
<td></td>
</tr>
<tr>
<td>Recommended electives</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Choose courses from the following list in consultation with adviser:</td>
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<td></td>
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<tr>
<td>BIOL/BNFO 601</td>
<td>Integrated Bioinformatics</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 606</td>
<td>Quantitative Ecology</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 610</td>
<td>Conservation Applications</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 618</td>
<td>Ecosystems Ecology</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 626</td>
<td>Physiological Ecology</td>
<td>4</td>
</tr>
<tr>
<td>BIOL 630</td>
<td>Patterns of Mammalian Reproduction</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 640</td>
<td>Evolution and Molecular Markers</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 650</td>
<td>Conservation Genetics</td>
<td>3</td>
</tr>
<tr>
<td>BIOL/ENVS/URSP 654</td>
<td>Environmental Remote Sensing</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 660</td>
<td>Developmental Biology</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 676</td>
<td>Plant and Animal Cell Biology</td>
<td>3</td>
</tr>
<tr>
<td>BIOL 690</td>
<td>Biology Seminar</td>
<td>1-4</td>
</tr>
<tr>
<td>BIOL 691</td>
<td>Special Topics in Biology</td>
<td>1-9</td>
</tr>
<tr>
<td>BIOL 692</td>
<td>Independent Study</td>
<td>1-4</td>
</tr>
<tr>
<td>BIOL 693</td>
<td>Current Topics in Biology</td>
<td>1-5</td>
</tr>
<tr>
<td>BIOL 698</td>
<td>Thesis</td>
<td>1-3</td>
</tr>
</tbody>
</table>

Any 500- or 600-level courses in ANAT, BIOL, BIOC, BIOS, BNFO, CLSE, EGRB, ENVS, HEMS, HGEN, LFSC, MEDC, MICR, NEUS, PCEU, PHTX, PHIS or STAT

Any 600-level course in CHEM, EDUS, GRAD, MATH, PHYS, PSYC or URSP

**Total graduate credit hours required (minimum) 30**

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Students should take STAT 543 or BIOS 543 as early as possible. Students entering the program with a statistics background equivalent to one of these courses may petition to have this requirement waived.

Students will work with faculty mentors during the first semester of enrollment to provide a plan of elective courses relevant to the subdiscipline.

Note: At least 19 credit hours must be courses designated exclusively for graduate students.

**Graduate program director**
James M. Turbeville, Ph.D.
Director of graduate studies
Email: jmturbeville@vcu.edu
Phone: (804) 828-0561

**Program website**: biology.vcu.edu/graduate-program/ms-program-in-biology (http://biology.vcu.edu/graduate-program/ms-program-in-biology)