Program goals

The graduate programs of the Department of Microbiology and Immunology in the School of Medicine include degrees offered at the master's and doctoral levels. These educational programs have as their mission the preparation of individuals for a variety of career objectives in microbiology and immunology. The programs incorporate formal instructional activities and, as appropriate, research training, mentored by the members of the faculty. The M.S. program is distinguished by inclusion of the preparation of the individual to function as a laboratory director or scientific investigator.

1. The program is designed to provide students with the skills required to advance to positions as bioscience researchers and trainers in a broad spectrum of positions.
2. The structure of the program provides a framework for the progressive development of a mastery of the current state of the subject matter of bioscience, an ability to synthesize this information and apply this foundation to the identification of key areas of investigation/experimentation in bioscience.
3. The program relates the above framework to the development of the ability to design, implement and interpret experimental approaches which address the questions identified.
4. In addition, the program will develop skills in the various means of communicating both the core of bioscience knowledge and the expression of experimental design, results and interpretation to a variety of potential audiences.

Student learning outcomes

1. Problem-solving skills: Degree candidates will demonstrate an appropriate level of skill in the identification and selection of meaningful problems to be addressed in bioscience research, including the ability to defend said identifications and to design and develop appropriate methods to solve said problems as measured by rubric.
2. General knowledge of sciences: Degree candidates will demonstrate an appropriate level of knowledge of the current elements of the biosciences as related to disciplinary specialization and a more detailed understanding of the individual area of scholarship, including an appropriate familiarity with the research literature and the ability to evaluate and critique publications as measured by rubric.
3. Communication skills: Degree candidates will demonstrate that an appropriate level of oral, written and visual communication skills have been acquired as measured by rubric.
4. Experimental design: Degree candidates will demonstrate the achievement of an appropriate level of competence in the ability to appraise, modify and/or create, and implement experimental protocols and to design and develop experiments as measured by rubric.

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.grad.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.

Visit the academic regulations section for additional information on academic regulations for graduate students. (http://bulletin.vcu.edu/academic-regs/)

Degree candidacy requirements

A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master’s or doctoral status according to the degree candidacy requirements of the student’s graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student’s faculty regarding the student’s academic achievements and the student’s readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements. (http://bulletin.vcu.edu/academic-regs/grad/candidacy/)

Graduation requirements

As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements. (http://bulletin.vcu.edu/academic-regs/grad/graduation-info/)

Other information

School of Medicine graduate program policies

The School of Medicine provides policies applicable to all programs administratively housed in the school. Information on master’s programs is available elsewhere in this chapter of the Graduate Bulletin.
Apply online at graduate.admissions.vcu.edu (http://www.gr...
OVPR 601  Scientific Integrity  1
or OVPR 602  Responsible Scientific Conduct
or OVPR 603  Responsible Conduct of Research

Total Hours  22

Electives

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Select seven credits from the following:</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>MICR 505</td>
<td>Immunobiology (if not taken previously)</td>
<td></td>
</tr>
<tr>
<td>MICR 515</td>
<td>Principles of Molecular Microbiology (if not taken previously)</td>
<td></td>
</tr>
<tr>
<td>MICR 605</td>
<td>Prokaryotic Molecular Genetics</td>
<td></td>
</tr>
<tr>
<td>MICR 607</td>
<td>Techniques in Molecular Biology and Genetics</td>
<td></td>
</tr>
<tr>
<td>MICR 608</td>
<td>Introduction to Microbiology and Immunology Research</td>
<td></td>
</tr>
<tr>
<td>MICR 616</td>
<td>Mechanisms of Viral and Parasite Pathogenesis</td>
<td></td>
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<tr>
<td>MICR 618</td>
<td>Molecular Mechanisms of Bacterial Pathogenesis</td>
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<tr>
<td>MICR/BNFO 653</td>
<td>Advanced Molecular Genetics: Bioinformatics</td>
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<tr>
<td>MICR 684</td>
<td>Molecular Biology of Cancer</td>
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<tr>
<td>MICR 686</td>
<td>Advanced Immunobiology</td>
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Take one of the following journal club courses for one semester every year: variable

| MICR 692   | Current Topics in Molecular Pathogenesis        |       |
| MICR 693   | Topics in Molecular Biology and Genetics        |       |
| MICR 694   | Current Topics in Immunology                    |       |

Total Hours  7

1

MICR 616 and MICR 618 are offered in alternate years.

Directed research

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tr>
<td>MICR 697</td>
<td>Directed Research in Microbiology (minimum 12 credits)</td>
<td>12</td>
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</table>

The minimum total of graduate credit hours required for this degree is 41.

Graduate program director
Cynthia Nau Cornelissen, Ph.D.
Professor, Department of Microbiology and Immunology
cynthia.cornelissen@vcuhealth.org
(804) 828-2306

Additional contact
Martha L. VanMeter
Office services specialist
martha.vanmeter@vcuhealth.org
(804) 828-9728

Program website: vcu.edu/micro (http://www.vcu.edu/micro/)