CLINICAL AND TRANSLATIONAL SCIENCES, MASTER OF SCIENCE (M.S.)

Program goal
The Master of Science in Clinical and Translational Sciences program provides training and mentoring for a new generation of investigators who, regardless of primary areas of interest, will be able to understand the methods and techniques used along the pathway from the bench to the bedside, to the community and beyond. The program emphasizes the importance of interdisciplinary approaches to research.

Student learning outcomes
1. Understand, integrate and apply relevant biomedical biobehavioral concepts and theoretical frameworks to research
2. Comprehend, select and apply the appropriate study design to address specific health issues
3. Critically review the scientific literature by applying sound research knowledge and principles to the review
4. Apply data collection processes and information technology to create, maintain and secure databases and other information
5. Apply ethical principles to study design, data collection and dissemination
6. Devise an analysis plan (statistical methodology) and analyze data using methods appropriate for the study design and type of data to be obtained
7. Identify, interpret and implement relevant laws, regulations and policies related to specific studies and/or programs
8. Plan, incorporate and use appropriate methods for the dissemination and adoption of clinical research findings
9. Manage as a clinical translational research team leader, including the fiscal, personnel, facilities, regulatory assets and scientific integrity of a funded clinical research program
10. Effectively communicate specialist-to-specialist
11. Effectively communicate specialist knowledge to nonspecialists and laypersons

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.

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/candidacy)

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

Admission requirements

| Degree: M.S. | Semester(s) of entry: Fall | Deadline dates: June 15 | Test requirements: None |

In addition to the general admission requirements of the VCU Graduate School (http://bulletin.vcu.edu/graduate/study/admission-requirements), please note the following:

1. Enrollment is open to VCU junior faculty or residents only.
2. Applicants should be early stage investigators or residents with terminal degrees (e.g. M.D., Ph.D., D.D.S., Sc.D., D.V.M., Ed.D., Pharm.D.).
3. Applicants should have a targeted research interest that is explained in a personal statement accompanying the graduate application.
4. A letter of support from the applicant’s department chair is mandatory.
5. A letter of commitment from an academic adviser is mandatory.
Degree requirements

In addition to the VCU Graduate School graduation requirements (http://bulletin.vcu.edu/academic-regs/grad/graduation-info), the master’s degree can be earned upon completion of 30 credit hours that combine didactic course work and directed research, including a master’s capstone project in the form of a peer-reviewed journal article or a grant proposal.

The program provides a sound foundation in clinical and translational research principles and thereby prepares the student to engage in many components of investigative processes. Students are expected to attend the research seminar course each semester they are in the program (and register for the course a minimum of three times) in order to stay abreast of current health and human services research and to develop their communication skills. Additionally, students must complete a course on responsible conduct of research and scientific integrity, which will ensure that students understand the broad ethical implications of biobehavioral and biomedical research, understand what constitutes scientific fraud and misconduct and are aware of their responsibilities as scientists.

When students have reached 27 credit hours of didactic and research course work, they must register for CCTR 700, which may be in one of two forms: an NIH-style grant proposal or a peer-reviewed journal article ready for submission.

This project will be overseen and reviewed by the student's research advisory committee. Students are expected to present their final projects to the committee for acceptance.

Curriculum requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>BIOS 543</td>
<td>Graduate Research Methods I</td>
<td>3</td>
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<tr>
<td>BIOS 544</td>
<td>Graduate Research Methods II</td>
<td>3</td>
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<td>CCTR 520</td>
<td>Fundamentals of Research Regulation</td>
<td>2</td>
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<tr>
<td>CCTR 630</td>
<td>Design Implications in Clinical Trials</td>
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<td>CCTR 631</td>
<td>Adaptive Clinical Trials</td>
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<tr>
<td>CCTR 690</td>
<td>Research Seminar in Clinical and Translational Sciences (one credit, taken for two semesters)</td>
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<td>CCTR 697</td>
<td>Directed Research in Clinical and Translational Sciences</td>
<td>9</td>
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<tr>
<td>CCTR 700</td>
<td>Master's Capstone Project</td>
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<tr>
<td>OVPR 601</td>
<td>Scientific Integrity</td>
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<td>or OVPR 602</td>
<td>Responsible Scientific Conduct</td>
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<td>or OVPR 603</td>
<td>Responsible Conduct of Research</td>
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<td>Elective</td>
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<td>Total Hours</td>
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Electives

Examples of potential electives include but are not limited to:

- ANAT 615 Techniques in Neuroscience and Cell Biology
- ANAT 620 Scientific Writing and Grantsmanship
- BIOC 530 Biochemistry, Cell and Molecular Biology Module 1: Protein Structure and Function
- BIOC 532 Biochemistry, Cell and Molecular Biology Module 3: Central Dogma of Molecular Biology
- BIOS 668 Statistical Methods for High-throughput Genomic Data II
- BNO 621 Business and Entrepreneurship Essentials for Life Scientists
- CCTR 640 Team Science: Theories and Practice
- CCTR 801 & CCTR 802 & CCTR 803 Clinical Practicum and Research Practicum I and Research Practicum II
- EPID 571 Principles of Epidemiology
- EPID 603 Public Health Policy and Politics
- EPID 606 Epidemiologic Methods
- MEDC 530 Bioinformatics and Genomics in Drug Research
- NURS 773 Perspectives on Research Design

Total graduate credit hours required (minimum) 30

Graduate program director
Teraya Donaldson, Ph.D.
Assistant director of education
Center for Clinical and Translational Research
cctred@vcu.edu
(804) 828-6671

Additional contact
T’Keyah Johnson
Education coordinator
Center for Clinical and Translational Research
johnsonTC3@vcu.edu
(804) 628-5414

Program website: cctr.vcu.edu/education (http://www.cctr.vcu.edu/education)