Master of Science

Biomedical Sciences-Research (MS)

The Biomedical Sciences - Research Master of Science (MS) program provides interdisciplinary training in biomedical research through a combination of advanced coursework, laboratory investigation, and professional skill development. The program is designed to provide students with a strong foundation in the molecular, cellular, systems, and translational mechanisms underlying human health and disease while fostering critical thinking, quantitative analysis, and scientific communication skills.

Students complete a core curriculum that establishes a broad foundation in biomedical sciences, followed by laboratory rotations, mentored independent research, and advanced elective coursework that supports individualized academic and career interests. Through hands-on research experiences in collaborative research environments, students develop technical and analytical competencies applicable to careers in biotechnology, pharmaceutical sciences, academic and clinical research, healthcare-related industries, government laboratories, and science education. The program also provides strong preparation for advanced doctoral or professional study, including PhD, MD, and related biomedical and health professions programs.

This program is offered to students with two options: thesis or non-thesis. Students select their degree pathway during the second year of study. Both options require completion of independent laboratory research under faculty mentorship, core coursework, laboratory rotations, and advanced electives.

• Thesis Option:
Students completing the thesis option conduct an original research project culminating in a written thesis and formal oral defense.

• Non-Thesis Option:
Students completing the non-thesis option prepare a written scholarly report based on their research experience and deliver an oral presentation to their advisory committee.

Admission

The Biomedical Sciences Research Master's program is now participating in the BioMedCAS (https://biomedcas2024.cas.myliaison.com/applicant-ux/#/login), specifically designed for biomedical programs.

Applicants to the program must have:

- A bachelor's degree prior to matriculating as a student
  - If the bachelor's degree was issued by a U.S. college or university, as a general rule it should be from a regionally accredited institution. However, the program may grant exceptions on a case-by-case basis.
  - Official transcripts from the awarding institution must specify the date upon which the degree was issued.
- A cumulative grade point (GPA) of 3.0 or better (preferred)
  - We conduct a holistic review of applications and consider an applicant's entire record. We pay special attention to science and math course grades, and we prefer to accept applicants with mostly A's and B's in these courses.
- Successfully completed the following courses:
  - General Biology (one semester with lab)
  - Additional Biology (one semester with lab)
  - General Chemistry (two semesters with labs)
  - Organic Chemistry I (one semester with lab)
  - Organic Chemistry II or Biochemistry (one semester, lab not required)
  - General Math, Calculus or Statistics (one semester)
  - College Math or Physics (one semester)
- Completed the Test of English as a Foreign Language (TOEFL)
  - This applies to international applicants only.
- Completed the online application (https://biomedcas2024.cas.myliaison.com/applicant-ux/#/login) including a personal statement, along with an application fee
- Official transcripts from all colleges and universities attended, sent by the registrar at those institutions
  - Official transcripts from the awarding institution must specify the date upon which the degree is issued.
  - Graduate Record Exam (GRE) is no longer required for admission to this program
  - Official TOEFL scores (if applicable)
  - Two letters of recommendation (LOS) submitted using the form provided within the online application. LOS should be from professional references, preferably written by faculty at colleges attended by the applicant who are familiar with the student's academic and research capabilities.
- Transcripts must be sent to BioMedCAS (https://biomedcas2024.cas.myliaison.com/applicant-ux/#/login) only. BioMedCAS (https://biomedcas2024.cas.myliaison.com/applicant-ux/#/login) only accepts electronic transcripts from the following sites:
  - Credentials Solutions (http://www.transcriptsplus.net/order/)
  - Parchment (https://www.parchment.com/order/)
  - National Student Clearinghouse (https://www.studentclearinghouse.org/)

If your school does not offer these services, download and send a transcript request form to your school's registrar, who should send the transcript to:

BioMedCAS Transcript Processing Center
P.O. Box 9207
Watertown, MA 02471

Additional Requirements for International Applicants

Sending International Transcripts to BioMedCAS

- BioMedCAS will ONLY accept the evaluation report from the credentialing agency. Do not send your foreign transcript to BioMedCAS.
- All other foreign transcript evaluations from the credentialing agency must be sent directly to BioMedCAS.

Transcript evaluation: International applicants who attended any institution outside of the United States must contact one of the following credentialing agencies to submit transcripts for official evaluation:

- World Education Services (http://www.wes.org/)
- Educational Credential Evaluators (http://www.ece.org/)

These are preferred credentialing services. If you wish to select a company other than these, please contact us (https://www.evms.edu/education/masters_programs/biomedical_sciences_research_masters_program/application_process/#Contact) first.

Note: It can take 4 to 6 weeks for transcript evaluations to arrive after the agency receives transcripts. Plan ahead and request these documents early. Incomplete applications will not be reviewed.

Translation: If the academic institution that you attended does not issue documents in English, the credentialing agency may require that you submit a word-for-word translation of your transcripts if they do not have this service available for purchase. You can contact University Language Services (http://www.universitylanguage.com/) to submit your transcript for translation and instruct them to send the translated transcript to the credentialing agency.

TOEFL: International applicants whose native language is not English must take the TOEFL exam and receive a score as follows:

- Paper-based test: 550
- Computer-based test: 213
- IBT exam: 80

the TOEFL School Code is B886.

Please take the TOEFL exam online through the Education Testing Service (http://www.ets.org/) (ETS), and request your TOEFL scores be sent directly to Admissions and Enrollment team for Health Professions. ETS reports scores for two years after the test date. If you have previously taken the TOEFL but the two-year period has expired, the program will accept a personal copy if available.

Transfer Credit Policy

Transfer of credit may be allowed for courses comparable to those offered in our programs. Courses must have been taken at an accredited biomedical or biological sciences graduate program in the U.S. Grades of B or higher or a passing grade in a pass/fail course are required. The Biomedical Sciences Research master's program may accept up to nine transfer credits. Transfer credit will be determined by the Program Director in consultation with program faculty after a student matriculates into the program.

Official transcripts must be sent to BioMedCAS. Test scores and supportive application documents should be electronically submitted or mailed to Admissions and Enrollment.

Early Assurance Program

The Early Assurance Program (EAP) exists to offer outstanding and qualified undergraduate students with firm interests in a career in biomedical science and the opportunity to gain early assurance of acceptance into the Biomedical Sciences Research Master's program before beginning their final year of college.

By granting early assurance of acceptance into the program, students will be able to broaden their academic focus, engage in extracurricular leadership activities and pursue first-hand, lab experience.

Partner Institutions

- Norfolk State University
- Regent University
- Hampton University
- Longwood University
- Virginia Wesleyan University
- Hampden-Sydney College
- Christopher Newport University

Each January, early assurance program advisers at each partner institution will forward names of eligible students who are interested in applying to the Biomedical Sciences Research Master's program through the Early Assurance Program. Students interested in the program are required to maintain regular contact with the EAP adviser during their college career. Eligible students will receive an email containing the necessary links and instructions to apply.

Below are the main steps necessary to apply through the Early Assurance Program:

- Meet with the EAP adviser at your institution as soon as possible.
- Establish a plan to complete prerequisites, certification and patient care experience prior to application deadline.
- Complete the BioMedCAS application by June 15 of your junior year.
- Complete the undergraduate degree requirements and maintain EAP eligibility.

Eligibility

To be eligible to apply for the Early Assurance Program, a student must:

- Have completed the fall semester of their junior year with only one more academic year to complete;
- Meet all institutional and degree requirements to continue as a student in good standing;
- Maintain an overall (cumulative) GPA of 3.25 or better;
- Have satisfactorily completed seven of eight prerequisite courses by the time of application without withdrawing from or repeating any courses used to satisfy the prerequisites;
- Obtain grades of B or above in all science courses taken in sophomore, junior, or senior year;
- Have no academic or conduct code violations.

Maintaining Eligibility

Continuation in the EAP will require evidence of general academic progress consistent with past performance, and of significant progress toward achievement of individually specified goals outlined in the application. Ongoing communication between the EAP applicant, the EAP advisor, and the Biomedical Sciences program will ensure that both the school's requirements and individual applicant's objectives are being met. In addition, the following criteria must be maintained by the student to continue eligibility:

- Meet with EAP adviser each semester;
- Maintain contact with the Biomedical Sciences Program during the senior year;
- Carry sufficient credit load during the remaining regular academic semesters to fulfill undergraduate degree requirements;
- Maintain an overall (cumulative) GPA of 3.25 or better with consistent academic performance; obtain grades of B or above in all science courses taken after the freshman year;
- Make significant progress toward achieving the individually-specified goals outlined on the PUR submitted with the student's application;
- Fulfill all institution and degree requirements to maintain status as a student in good standing (no academic or conduct code violations) and earn a bachelor's degree prior to matriculating in the Research MS program;
- Complete any additional specific matriculation conditions set by the Research MS program at the time of acceptance notification (e.g., official transcripts confirming date of degree conferral, a criminal background check, indication of ability to independently meet the Technical Standards, and submission of all health requirements)

Failure to meet or maintain these eligibility standards will constitute grounds for dismissal from the program. Admission to the Research MS Program can be denied if events occur that would cause the Admissions Committee to question a student's suitability to pursue a career in biomedical research. These include, but are not limited to, misdemeanor or felony convictions, academic dishonesty or other code of conduct violations, unprofessional conduct in a laboratory or education setting, or inability to meet the Technical Standards.

Technical Standards

The abilities and skills candidates and students must possess in order to complete the education and training of the Biomedical Sciences Research master's programs are referred to as technical standards. These abilities and skills are essential for entry into most professional practice settings associated with this degree program.

1.0 Observation Skills Technical Standard

1.01 Demonstrate sufficient attention and accuracy in observation skills (visual, auditory and tactile) in the lecture hall, laboratory and/or online settings.

1.02 Indicators include, but are not limited to, this example:

1. Accurate visualization and discrimination of text, numbers, patterns, graphic illustrations and other imaging texts.

2.0 Communication Skills Technical Standard

2.01 Demonstrate effective communication skills with other students, faculty members, laboratory staff members and scientific colleagues.

2.02 Indicators include, but are not limited to, these examples:

1. Clear, efficient and intelligible articulation of verbal language.
2. Legible, efficient and intelligible written English language.
3. Accurate and efficient English language reading skills.
4. Accurate and efficient expressive and receptive communication skills.
5. Ability to accurately follow oral and written directions.

3.0 Critical Reasoning Skills Technical Standard

3.01 Demonstrate critical reasoning skills, including, but not limited to, intellectual, conceptual, integrative and quantitative abilities.

3.02 Indicators include, but are not limited to, these examples:

1. Demonstrate ability to measure, calculate, reason, analyze, integrate and synthesize information.
2. Demonstrate ability to acquire, retain and apply new and learned information.
3. Demonstrate ability to pursue a course of independent research in a laboratory setting, including the ability to plan and execute experiments.

4.0 Motor And Sensory Function Technical Standard

4.01 Demonstrate sufficient motor and sensory function to perform typical research laboratory duties.

4.02 Indicators include, but are not limited to, these examples:

1. Functional and sufficient sensory capacity (visual, auditory and tactile) to use laboratory equipment and perform experiments.
2. Execute motor movements that demonstrate safety and efficiency in the various learning settings (i.e., classroom and laboratories).
3. Physical stamina sufficient to complete the didactic and laboratory requirements, including prolonged periods of sitting or standing.

5.0 Behavioral And Social Attributes Technical Standard

5.01 Demonstrate the behavioral and social attributes vital to participation in a professional program and service as a practicing laboratory professional.

5.02 Indicators include, but are not limited to, these examples:

1. Possess the emotional health required for full utilization of mental faculties (judgment, orientation, affect and cognition).
2. Ability to develop mature and effective professional relationships with faculty, students and other members of the research team.
3. Demonstrate impartial motives, attitudes and values in roles, functions and relationships.
4. Ability to monitor and react appropriately to one’s own emotional needs and responses.
5. Display appropriate flexibility and adaptability in the face of stress or uncertainty associated with technical difficulties in research or scientific review (e.g., criticism of ideas shared in written or oral presentations, manuscripts, etc.)
6. Compliance with standards, policies, and practices outlined in the Student Handbook (https://www.odu.edu/virginia-health-sciences/student-policies-handbooks/) and the BMS Program Handbook.

Curriculum Requirements

Thesis Option

(Path Decision - Fall Semester of 2nd Year)

Core Course Sequence

Year 1 - Fall (9 credits)

3	Biomedical Sciences-Research (MS)	
BMED 700	Scientific Communication	1
BMED 701	Biomedical Sciences Lab Rotation I	1
BMED 710	Core Concepts 1: Foundations of Biomedical Science	5
BMED 711	Molecular & Cellular Techniques	2
Year 1 - Spring (10 credits)		
BMED 698	Masters Research	1
BMED 700	Scientific Communication	1
BMED 702	Biomedical Sciences Lab Rotation II	1
BMED 703	Biomedical Sciences Lab Rotation III (optional, elective)	
BMED 720	Core Concepts 2: Systems and Translational Biology	5
BMED 721	Biostatistics for the Biomedical Sciences	1
BMED 722	Responsible Conduct in Science	1
Year 1 - Summer (3 credits)		
BMED 698	Masters Research ((Elective 2-3 credit in lieu of research)	3
Year 2 - Fall (9 credits)		
BMED 698	Masters Research (Elective 2-3 credits in lieu of research)	6
BMED 700	Scientific Communication	1
BMED 730	Methods & Logic in Translational Biology	2
Year 2 - Spring (5 credits)		
BMED 699	Thesis Research	5
or BMED 694	Scholarly Research Project	
BMED 700	Scientific Communication (optional)	
Year 2 - Summer (optional)		
BMED 998	Masters Graduate Credit (optional)	
Total Credit Hours		**36**

Non-Thesis Option

(Path Decision - Fall Semester of 2nd Year)