Doctor of Philosophy

Biomedical Sciences (PhD)

The Biomedical Sciences PhD program offers multidisciplinary training designed to prepare students for successful careers. Core coursework and laboratory rotations provide a strong foundation across the biomedical sciences, while advanced training is tailored to each student's specific interests. Areas of study explore the molecular, cellular, and organismal mechanisms underlying human diseases, with opportunities to specialize in fields such as cancer biology, cardiovascular physiology, endocrinology, infectious disease, neurobiology, and reproduction.

Admission

The Biomedical Sciences, PhD 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.
- An overall grade point average (GPA) of 3.0 or higher (undergraduate and graduate GPA combined).
  - While a holistic review is adopted, admission is competitive; most accepted applicants have a cumulative GPA of 3.3 or higher.
- Completed the Test of English as a Foreign Language (TOEFL)
  - This applies to international applicants only.
- Successfully completed the following courses:
  - General Biology (1 semester with lab)
  - Additional Biology (1 semester with lab)
  - Calculus and/or statistics (1 year)
  - General Chemistry (1 year with lab)
  - Organic Chemistry I (1 semester with lab)
  - Organic Chemistry II or Biochemistry (1 semester, lab not required)
  - Physics (one semester; one year preferred)
    - An additional course in mathematics, computer science or chemistry may substitute for the second semester of physics.

  Applicants must also have previous laboratory research experience, and we recommend that they take additional courses in biology, chemistry, and physics.

- Complete the online application (https://biomedcas2024.cas.myliaison.com/applicant-ux/#/login) including a personal statement, along with the $86 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.
  - Transcripts must be sent to BioMedCAS (https://biomedcas2024.cas.myliaison.com/applicant-ux/#/login) only. BioMedCAS only accepted electronic transcripts from Credentials Solutions, Parchment, and National Student Clearinghouse. If your school does not offer either of these services, your transcripts must be sent via mail. Please use the information below to send your transcripts.
- Sending transcripts to BioMedCAS electronically:
  - Credentials Solutions - http://www.transcriptsplus.net/order (http://www.transcriptsplus.net/order/)
  - Parchment - https://www.parchment.com/order/ (https://www.parchment.com/order/%C2%A0/)
  - National Student Clearinghouse - http://www.studentclearinghouse.org (http://www.studentclearinghouse.org/)
- Sending transcripts to BioMedCAS by mail:
  - Download a transcript request form after you enter each institution in BioMedCAS.
  - Send the transcript request form to the institution registrar to send the transcript by mail to the address below:

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

- Three letters of recommendation submitted using the form provided within the online application
  - At least two letters should be written by faculty at colleges attended by the applicant who are familiar with the student's academic and research capabilities
  - Only professional references are acceptable. Letters from personal friends and family members will not be considered.

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 the 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 program. 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 PhD program may accept up to 12 transfer credits. Transfer credit will be determined by the program director in consultation with program faculty after matriculation of a student into the program.

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

Technical Standards

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

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 set forth in the Student Handbook (https://www.evms.edu/education/resources/student_policies_handbooks/) and the program handbook.

Curriculum Requirements

Our program aims to develop graduates who will pursue careers as independent investigators with an appreciation for both basic and clinical aspects of biomedical research.

Students will complete 1.5 years of core academic courses, three laboratory rotations and advanced electives. Beginning in the summer following the first year, students will start mentored research projects in a faculty member's laboratory.

Core Course Sequence		
Year 1 - Fall		*12*
BP 700	Molecules to Cells	
BP 703	Cell Communication and Signaling	
BP 701	Molecular and Cellular Techniques	
BP 704	Molecular Genetics	
BP 708	Oral Communication Forum	
BP 819	Lab Rotation I	
Year 1 - Spring		*11*
BP 706	Cell Energetics & Organ Function	
BP 708	Oral Communication Forum	
BP 781	Applied Biostatistics & Bioinformatics	
BP 820	Lab Rotation II	
BP 821	Lab Rotation III	
Year 2 - Fall		*6*
BP 709	Scientific Writing & Research Design	
BP 771	Methods & Logic in Translational Biology	
BP 773	Responsible Conduct in Science	
BP 795 Elective Courses		**6**
Elective courses are taken as available and in lieu of research		
BP 898 Research		**30**
BP 708 Oral Communication Forum		**5**
BP 899 Dissertation		**9**
Total Credit Hours		**79**