

## PRE-MEDICAL BASIC HEALTH SCIENCES CERTIFICATE

**Program Description** The Pre-Medical Basic Health Sciences Certificate Program of Virginia Commonwealth University offers the opportunity for advanced graduate level training for individuals seeking to enhance their background in the basic health sciences prior to entry into professional school. The program offers defined curricula in six disciplinary areas (Anatomy, Biochemistry, Human Genetics, Microbiology, Pharmacology and Physiology) as detailed below. The curricula define an intensive program of study intended for completion in two successive academic semesters. Applicants to the program designate a preferred area of specialization with admission determined by the Department. Admission to the program is competitive. As a guide, applicants should anticipate meeting the minimum expectations of performance and achievement described below. Specialization areas may require additional pre-requisites beyond those listed. Individual departments should be contacted for detailed information.

**Admission Requirements** Applicants should have successfully completed undergraduate training and hold a baccalaureate degree. Training in chemistry through completion of course work in organic chemistry is required. Admissions to the program are generally drawn from applicants with an undergraduate grade point average above 2.80 (on a 4.0 scale or equivalent), a performance on the Graduate Record Examination above a combined score of 1600 (V+Q+A); a performance above a score of 1100 on the verbal and quantitative sections) or a quantitative score on the MCAT examination greater than 22. Applicants holding an undergraduate degree from recognized foreign institutions must display an acceptable level of English proficiency by achieving a score of 600 on the TOEFL examination.

**Course Requirements** Students must complete a minimum of twenty-seven (27) credit hours of course work with a cumulative grade point average (GPA) of 3.0 (on a 4.0 scale) or better. Courses must be drawn from the listing of required and elective courses identified at the Department level for each of the specializations. The curriculum should be completed in successive full academic terms (typically the Fall and Spring semester). Completion of the program does not afford a guarantee of admission to professional training programs at Virginia Commonwealth University. On completion of the program, individuals may elect to seek admission to advanced degree (M.S., Ph.D.) programs. The curricula have been developed so as to satisfy didactic requirements of these programs. Individuals interested in exploring the requirements for admission to advanced degree training should consult with the program directors listed.

Inquiries may be addressed to: School of Graduate Studies  
Virginia Commonwealth University  
Richmond, Virginia 23284-3051  
(804) 828-6916

**To Apply** Applications for admission to the program must complete forms provided by the School of Graduate Studies indicating "Pre-Medical BHS Certificate" as the curriculum and designating a preferred specialization from the six listed below. Detailed information on the curricula is also available from the individual Program Directors at Virginia Commonwealth University, Richmond, Virginia 23298.

Anatomy	George Leichnetz, Ph.D.	Email:gleichne@hsc.vcu.edu	(804) 828-9512
Biochemistry	Keith Shelton, Ph.D.	Email:kshelton@hsc.vcu.edu	(804) 828-9526
Human Genetics	Linda Corey, Ph.D.	Email:corey@hsc.vcu.edu	(804) 828-8759
Microbiology	Guy Cabral, Ph.D.	Email:gacabral@hsc.vcu.edu	(804) 828-2306
Pharmacology	Stephen Sawyer, Ph.D.	Email:ssawyer@hsc.vcu.edu	(804) 828-7918
Physiology	George Ford, Ph.D.	Email:ford@hsc.vcu.edu	(804) 828-9501

Contact and application information is available on the Web for the School of Medicine ([www.medschool.vcu.edu](http://www.medschool.vcu.edu)) and the School of Graduate Studies ([www.vcu.edu/gradweb](http://www.vcu.edu/gradweb))

## Pre-Medical Basic Health Sciences Certificate Curricula

### ANATOMY

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| <ul style="list-style-type: none"> <li>(5) <b>BIOC/MICR 503 Biochemistry, Cell and Molecular Biology (BCMB)</b></li> <li>(5) <b>ANAT 611 Histology</b></li> <li>(1) <b>ANAT 690 Anatomy Seminar</b></li> <br/> <li>(3) <i>ANAT 509/PHTX 509/PHIS 509 Introduction to Neuroscience</i></li> <li>(3) <i>MICR 505 Immunobiology</i></li> <li>(5) <i>PHIS 501 Mammalian Physiology</i></li> </ul> | <ul style="list-style-type: none"> <li>(5) <b>MICR/BIOC 504 BCMB</b></li> <li>(5) <b>ANAT 610 Neuroanatomy</b></li> <li>(4) <b>PHIS 604 Cell Physiology</b></li> <li>(1) <b>ANAT 690 Anatomy Seminar</b></li> </ul> |
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### BIOCHEMISTRY

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| <ul style="list-style-type: none"> <li>(5) <b>BIOC/MICR 503 BCMB</b></li> <li>(5) <b>PHIS 501 Mammalian Physiology</b></li> <br/> <li>(3) <i>PHTX 509/ANAT 509/PHIS 509 Introduction to Neuroscience</i></li> <li>(1) <i>BIOC 690 Biochemistry Seminar</i></li> <li>(3) <i>BIS 543 Statistical Methods I</i></li> <li>(3) <i>MICR 505 Immunobiology</i></li> </ul> | <ul style="list-style-type: none"> <li>(5) <b>MICR/BIOC 504 BCMB</b></li> <li>(4) <b>PHIS 604 Cell Physiology</b></li> <br/> <li>(3) <i>PHIS 512 Cardiovascular and Exercise Physiology</i></li> <li>(1) <i>BIOC 690 Biochemistry Seminar</i></li> <li>(3) <i>BIOC 605 Molecular Biology and Genetics</i></li> <li>(5) <i>PHTX 536 Principles of Pharmacology &amp; Toxicology</i></li> <li>(4) <i>PHTX 535 Introduction to Toxicology</i></li> <li>(5) <i>ANAT 610 Neuroanatomy</i></li> </ul> |
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### HUMAN GENETICS

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| <ul style="list-style-type: none"> <li>(5) <b>BIOC/MICR 503 BCMB</b></li> <li>(3) <b>HGEN 501 Introduction to Human Genetics</b></li> <li>(3) <b>BIS 543 Statistical Methods</b></li> <li>(2) <b>HGEN 502 Advanced Human Genetics</b></li> <li>(3)/(4) <b>HGEN 511 Cytogenetics/HGEN614 Biochemical and Molecular Genetics</b></li> <li>(1) <b>HGEN 690 Genetics Research Seminar</b></li> </ul> | <ul style="list-style-type: none"> <li>(5) <b>MICR/BIOC 504 BCMB</b></li> <li>(1) <b>HGEN 690 Genetics Research Seminar</b></li> <li>(3) <b>HGEN 603 Mathematical and Statistical Genetics</b></li> <li>(2) <b>HGEN 502 Advanced Human Genetics</b></li> <li>(1) <b>HGEN 691 Introduction to Clinical Genetics</b></li> <br/> <li>(3) <i>HGEN 600 Clinical Genetics</i></li> <li>(3) <i>HGEN 516 Population Genetics</i></li> <li>(3) <i>HGEN 518 Methods in Human Population Genetics</i></li> <li>(3) <i>HGEN 617 Segregation and Linkage Analysis</i></li> <li>(3) <i>HGEN 619 Quantitative Genetics</i></li> <li>(3) <i>HGEN 620 Behavior Genetics</i></li> </ul> |
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### MICROBIOLOGY

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| <ul style="list-style-type: none"> <li>(5) <b>BIOC/MICR 503 BCMB</b></li> <li>(3) <b>MICR 505 Immunology</b></li> <li>(3) <b>MICR 519 Molecular Mechanisms of Microbial Pathogenesis</b></li> <br/> <li>(2) <i>MICR 507 Techniques in Molecular Biology and Genetics</i></li> <li>(5) <i>PHIS 501 Mammalian Physiology</i></li> <li>(3) <i>MICR 606 HGENe Expression</i></li> <li>(3) <i>HGEN 501 Introduction to Human Genetics</i></li> <li>(3) <i>PHTX 509/PHIS 509/ANAT 509 Introduction to Neurosciences</i></li> <li>(3) <i>MICR 604 Cell Physiology Metabolism</i></li> </ul> | <ul style="list-style-type: none"> <li>(5) <b>MICR/BIOC 504 BCMB</b></li> <li>(3) <b>MICR 516 Medical Microbiology</b></li> <br/> <li>(3) <i>BIOC 605 Molecular Biology</i></li> <li>(4) <i>PHIS 604 Cell Physiology</i></li> <li>(3) <i>PHTX 632 Neurochemical Pharmacology</i></li> <li>(3) <i>HGEN 603 Mathematical and Statistical Genetics</i></li> </ul> |
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| <ul style="list-style-type: none"> <li>(5) <b>BIOC/MICR 503 BCMB</b></li> <li>(5) <b>PHIS 501 Mammalian Physiology</b></li> <br/> <li>(4) <b>PHTX 597 Introduction to Pharmacological Research</b></li> <li>(1) <b>PHTX 690 Pharmacology Research Seminar</b><br/>Representative Curriculum; consult Program Director for specialized course plans</li> </ul> | <ul style="list-style-type: none"> <li>(5) <b>MICR/BIOC 504 BCMB</b></li> <li>(5) <b>PHTX 536 Principles of Pharmacology &amp; Toxicology</b></li> <li>(4) <b>PHTX 597 Introduction to Pharmacological Research</b></li> <li>(1) <b>PHTX 690 Pharmacology Research Seminar</b></li> </ul> |
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### PHYSIOLOGY

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| <ul style="list-style-type: none"> <li>(5) <b>PHIS 501 Mammalian Physiology</b></li> <li>(5) <b>BIOC/MICR 503 BCMB</b></li> <li>(1) <b>PHIS 690 Research Seminar</b></li> <br/> <li>(3) <i>PHIS 509/ANAT 509/PHTX 509 Introduction to Neuroscience</i></li> <li>(3) <i>PHIS 605 Mathematical Physiology</i></li> <li>(3) <i>PHTX 548 Drug Dependence</i></li> <li>(5) <i>ANAT 611 Histology</i></li> <li>(3) <i>MICR 505 Immunobiology</i></li> <li>(3) <i>HGEN 501 Human Genetics</i></li> <li>(3) <i>BIS 543 Statistical Methods I</i></li> </ul> | <ul style="list-style-type: none"> <li>(4) <b>PHIS 604 Cell Physiology</b></li> <li>(5) <b>MICR/BIOC 504 BCMB</b></li> <li>(1) <b>PHIS 690 Research Seminar</b></li> <br/> <li>(5) <i>PHTX 536 Principles of Pharmacology &amp; Toxicology</i></li> <li>(3) <i>PHIS 512 Cardiovascular and Exercise Physiology</i></li> <li>(3) <i>PATH 522 Clinical Chemistry</i></li> <li>(6) <i>ANAT 610 Neuroanatomy</i></li> <li>(4) <i>PHTX 535 Introduction to Toxicology</i></li> <li>(3) <i>PHTX 548 Drug Dependence</i></li> <li>(3) <i>PHTX 6901 Psychoneuroimmunology</i></li> </ul> |
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