

# BIOMEDICAL SCIENCES

## Joint Degrees

### Joint M.D./Ph.D. with the College of Medicine

Requirements listed here are in addition to requirements listed in GCAC-211 Joint Degree Programs (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-200/gcac-211-joint-degree-programs/>).

#### Admission Requirements

Prospective students interested in simultaneously pursuing a M.D. and Ph.D. degree must apply to the College of Medicine M.D. program using the national American Medical College Application Service (AMCAS) application system and indicate their intent to pursue the joint-degree program. Applicants must also meet the admission requirements of the Graduate School and the Ph.D. admission requirements listed on the Admission Requirements tab, however, GRE scores are not required. The M.D./Ph.D. Admissions Committee reviews applications and evaluates candidates for acceptance into both the M.D. and Ph.D. programs. After the review committee has accepted an applicant to the joint degree program, s/he must apply to the Graduate School (<http://www.gradschool.psu.edu/prospective-students/how-to-apply/>) for admission to the graduate program. Students must be admitted to the joint degree program prior to taking the first course they intend to count towards the graduate degree. Applicants not accepted into the joint-degree program may be referred to either the M.D. or Ph.D. program, depending on their qualifications.

Applicants to this program generally have very strong grades and MCAT scores, as well as a strong and sustained background in research. Applicants must be able to clearly articulate reasons for pursuing the joint degree. Letters of recommendation from faculty who have advised the applicant in research and who can comment on the applicant's passion and potential for research are strongly encouraged.

#### Degree Requirements

Students must fulfill all requirements for each degree in order to be awarded that degree. Degree requirements for the M.D. program are listed on the Penn State College of Medicine website (<http://www.med.psu.edu/web/md/home/>). If students accepted into the joint degree program are unable to complete the M.D. degree, they are still eligible to receive the Ph.D. degree if all the Ph.D. degree requirements have been satisfied.

During the first two years of medical school, the student conducts at least three research rotations. After successful completion of the first two years of medical school the student enters the BMS Graduate Program and may be admitted to one of its options.

During the summer after the second year of medical school M.D./Ph.D. students take Step 1 of the United States Medical Licensing Examination (USMLE), which serves as the qualifying examination for the BMS Graduate Program.

In addition to the requirements for the Ph.D. committee (<http://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/phd-dissertation-committee-formation/>) for a Ph.D. student in the BMS Graduate Program, at least one member of the Ph.D. committee must be on the M.D./Ph.D. Steering Committee. This member may serve other roles on the Ph.D. committee.

M.D./Ph.D. students must complete 28 credits:

Code	Title	Credits
<b>Required Courses</b>		
8 credits from the first two years of medical school will be double-counted towards the Ph.D., replacing the following required core courses:		8
BMS 502	Cell and Systems Biology	
BMS 503	Advanced Molecular Genetics	
BMS 596	Individual Studies	
In addition to the curriculum of the first two years of medical school at the Penn State College of Medicine, all M.D./Ph.D. students in the BMS Graduate Program take the following core courses:		
BMS 506A	Biological Basis of Human Health and Disease A	2
BMS 506B	Biological Basis of Human Health and Disease B	2
BMS 512	Data Analysis For The Biomedical Laboratory Scientist, A Practical Approach	2
BMS 590	Colloquium	4
BMS 591	Biomedical Research Ethics	1
BMS 801	Writing Grant Proposals for Biomedical Research	1
In addition, students must take 2 credits of Colloquium or Journal Club, which is fulfilled by taking any of the following:		2
BCHEM 590	Colloquium	
PSIO 501	Scientific Analysis and Presentation	
PHARM 590	Colloquium	
MICRO 590	Colloquium	
MICRO 572	Literature Reports	
NEURO 590	Colloquium	
VIRIM 580	Critical Reading in Immunobiology	
At least 6 elective credits of 500-level elective courses selected in consultation with the student's dissertation adviser and Ph.D. committee.		6
<b>Total Credits</b>		<b>28</b>

The M.D./Ph.D. candidate prepares a written comprehensive examination in the format of a grant application and gives an oral presentation of this proposal to their Ph.D. committee.

A dissertation must be prepared and defended by each M.D./Ph.D. candidate. The dissertation must be accepted by the Ph.D. committee, the chair of the graduate program, and the Graduate School, and the student must pass a final oral examination (the dissertation defense). Students are required to have at least one first-author publication accepted or published based on their dissertation research prior to the final oral examination.