

Medicine MD / PhD

Program Requirements

Students must complete all MD requirements, which also substitute for Year One PhD requirements. The remaining PhD requirements per program are listed below.

MD/PhD in Biochemistry of Health & Disease

Required Courses

BIOC 506S	Biochemistry Journal Club *	5.0
BIOC 507S	Biochemistry Seminar Series *	5.0
BIOC 508S	Experimental Approaches to Biochemical Problems	3.0
BIOC 511S	Communication for Researchers	2.0
BIOC 521S	Introduction to Biochemical Data	2.0
BIOC 600S	Biochemistry Thesis Research *	45.0
IDPT 500S	Responsible Conduct of Research	2.0
IDPT 600S	Thesis Defense	9.0

Advanced Electives **6.0**

Select at least two Advanced Electives for a minimum of 6.0 credits:

BIOC 520S	Macromolecular Structure & Function	
BIOC 522S	Biochemistry of Drug Discovery & Design	
BIOC 603S	Advanced Topics in Biochemistry and Molecular Biology	
CBIO 510S	Cancer Biology	
CBIO 512S	Advanced Cancer Biology	
MCBG 506S	Advanced Cell Biology	
MIIM 555S	Molecular Mechanisms of Microbial Pathogenesis	
MIIM 604S	Special Topics in Virology	
MIIM 630S	Advanced Molecular Biology	
NEUR 609S	Graduate Neuroscience II	
PHGY 503S	Graduate Physiology	
PHRM 512S	Graduate Pharmacology	
PHRM 525S	Drug Discovery and Development I	

General Electives

BIOC 502S	Biochemistry 1st Lab Rotation	
BIOC 503S	Biochemistry 2nd Lab Rotation	
BIOC 504S	Biochemistry 3rd Lab Rotation	
IDPT 501S	Biostatistics I	
IDPT 507S	Teaching Practicum I	
IDPT 508S	Teaching Practicum II	
IDPT 509S	Teaching Practicum III	

Total Credits **79.0**

* Taken each semester until the last, when only Thesis Defense is taken

MD/PhD in Microbiology & Immunology

Required Courses

IDPT 500S	Responsible Conduct of Research	2.0
IDPT 600S	Thesis Defense	9.0
MIIM 502S	Microbiology and Immunology Journal Club *	5.0
MIIM 514S	Grant Building	2.0
MIIM 600S	Microbiology and Immunology Thesis Research *	45.0
MIIM 606S	Microbiology and Immunology Seminar *	5.0

Advanced Electives **4.0**

Select at least two Advanced Electives for a minimum of 4.0 credits:

MIIM 528S	Structural Bioinformatics	
MIIM 555S	Molecular Mechanisms of Microbial Pathogenesis	

MIIM 607S	Immunology II	
MIIM 613S	Emerging Infectious Diseases	
MIIM 615S	Experimental Therapeutics	
MIIM 625S	Advanced Molecular Virology	
MIIM 630S	Advanced Molecular Biology	

General Electives

IDPT 501S	Biostatistics I	
IDPT 507S	Teaching Practicum I	
IDPT 508S	Teaching Practicum II	
IDPT 509S	Teaching Practicum III	
MIIM 504S	Microbiology and Immunology 1st Rotation	
MIIM 505S	Microbiology and Immunology 2nd Rotation	
MIIM 506S	Microbiology and Immunology 3rd Rotation	

Total Credits **72.0**

* Taken each semester until the last, when only Thesis Defense is taken

MD/PhD in Molecular & Cell Biology & Genetics

Required Courses

IDPT 500S	Responsible Conduct of Research	2.0
IDPT 600S	Thesis Defense	9.0
MCBG 506S	Advanced Cell Biology	2.0
MCBG 512S	MCBG Journal Club *	5.0
MCBG 513S	Molec & Cell Biology Seminar *	5.0
MCBG 600S	MCBG Thesis Research *	45.0

Advanced Electives **7.0**

Select at least three Advanced Electives for a minimum of 7.0 credits:

BIOC 508S	Experimental Approaches to Biochemical Problems	
BIOC 511S	Communication for Researchers	
BIOC 521S	Introduction to Biochemical Data	
BIOC 603S	Advanced Topics in Biochemistry and Molecular Biology	
CBIO 510S	Cancer Biology	
CBIO 512S	Advanced Cancer Biology	
MCBG 514S	Cell Cycle and Apoptosis	
MIIM 508S	Immunology I	
MIIM 555S	Molecular Mechanisms of Microbial Pathogenesis	
MIIM 607S	Immunology II	
MIIM 613S	Emerging Infectious Diseases	
MIIM 615S	Experimental Therapeutics	
MIIM 630S	Advanced Molecular Biology	
NEUR 508S	Graduate Neuroscience I	
NEUR 511S	Advanced Cellular and Developmental Neuroscience	
NEUR 512S	Advanced Systems and Behavioral Neuroscience	
PHRM 507S	Prin of Neuropharmacology	
PHRM 512S	Graduate Pharmacology	
PHRM 525S	Drug Discovery and Development I	
PHRM 526S	Drug Discovery and Development II	
PHRM 602S	Research Methods in Pharmacology	

General Electives

MCBG 501S	MCBG 1st Lab Rotation	
MCBG 502S	MCBG 2nd Lab Rotation	
MCBG 503S	MCBG 3rd Lab Rotation	
IDPT 501S	Biostatistics I	
IDPT 507S	Teaching Practicum I	
IDPT 508S	Teaching Practicum II	
IDPT 509S	Teaching Practicum III	

Total Credits **75.0**

* Taken each semester until the last, when only Thesis Defense is taken

MD/PhD in Neuroscience

Required Courses

IDPT 500S	Responsible Conduct of Research	2.0
IDPT 600S	Thesis Defense	9.0
NEUR 500S	Statistics for Neuro/Pharm Research	2.0
NEUR 520S	Neurobiology Topics I *	6.0
NEUR 521S	Neurobiology Topics II *	4.0
NEUR 600S	Neuroscience Thesis Research *	45.0
NEUR 609S	Graduate Neuroscience II	4.0

Advanced Electives 1.0-4.0

Select at least one of the following Advanced Electives:

NEUR 511S	Advanced Cellular and Developmental Neuroscience
NEUR 512S	Advanced Systems and Behavioral Neuroscience
NEUR 634S	Motor Systems

General Electives

IDPT 507S	Teaching Practicum I
IDPT 508S	Teaching Practicum II
IDPT 509S	Teaching Practicum III
MCBG 506S	Advanced Cell Biology
NEUR 501S	Neuroscience 1st Lab Rotation
NEUR 502S	Neuroscience 2nd Lab Rotation
NEUR 503S	Neuroscience 3rd Lab Rotatin
NEUR 508S	Graduate Neuroscience I
PHRM 507S	Prin of Neuropharmacology

Total Credits 73.0-76.0

* Taken each semester until the last, when only Thesis Defense is taken

MD/PhD in Pharmacology & Physiology

Required Courses

IDPT 500S	Responsible Conduct of Research	2.0
IDPT 600S	Thesis Defense	9.0
PHRM 502S	Current Topics in Pharmacology & Physiology *	5.0
PHRM 507S	Prin of Neuropharmacology	3.0
PHRM 516S	Advanced Topics in Physiology	1.0
PHRM 517S	Advanced Topics in Pharmacology	1.0
PHRM 600S	Pharmacology Thesis Research *	45.0

Advanced Electives 4.0

Select at least two Advanced Electives for a minimum of 4.0 credits:

BIOC 520S	Macromolecular Structure & Function
CBIO 510S	Cancer Biology
MIIM 508S	Immunology I
MIIM 521S	Biotechniques I: Molecular and Genomic Methods
PHRM 518S	New Frontiers in Therapy
PHRM 519S	Methods in Biomedical Research
PHRM 525S	Drug Discovery and Development I
PHRM 526S	Drug Discovery and Development II
MLAS 536S	Animal Models for Biomedical Research

General Electives

CR 500S	Epidemiology
CR 513S	Business Processes and Contemporary Concerns in Pharmaceutical R & D
CR 514S	World Wide Regulatory Submissions
CR 515S	Intro to Clinical Trials
CR 520S	Applications of Clinical Research Biostatistics
CR 525S	Scientific Writing and Medical Literature
CR 535S	Current Federal Regulatory Issues in Biomedical Research

CR 545S	Pharmaceutical Law
CR 550S	Leadership Skills
CR 555S	Compliance & Monitoring Issues
CR 570S	Principles and Practice of Pharmacovigilance
CR 600S	Designing the Clinical Trial
CR 609S	Innovative Product Development
CR 612S	Fundamentals of Compliance
CR 614S	Introduction to Clinical Pharmacology
CR 617S	Informatics in Pharm Res & Development
CR 620S	Regulatory, Scientific and Social Issues Affecting Biotech Research
CR 625S	Health Policy and Economics
CR 635S	Strategic Planning
IDPT 501S	Biostatistics I
IDPT 507S	Teaching Practicum I
IDPT 508S	Teaching Practicum II
IDPT 509S	Teaching Practicum III
NEUR 500S	Statistics for Neuro/Pharm Research
PHRM 503S	Pharm & Phys 1st Lab Rotation
PHRM 504S	Pharm & Phys 2nd Lab Rotation
PHRM 505S	Pharm & Phys 3rd Lab Rotation

Total Credits 70.0

* Taken each semester until the last, when only Thesis Defense is taken

Sample Plan of Study

MD/PhD in Biochemistry of Health & Disease

First Year

Fall	Credits Spring	Credits
First Year MD Curriculum	First Year MD Curriculum	
	0	0

Second Year

Fall	Credits Spring	Credits
Second Year MD Curriculum	Second Year MD Curriculum	
	0	0

Third Year

Fall	Credits Spring	Credits
Third Year MD Curriculum	Third Year MD Curriculum	
	0	0

Fourth Year

Fall	Credits Spring	Credits
BIOC 506S	1.0 BIOC 506S	1.0
BIOC 507S	1.0 BIOC 507S	1.0
BIOC 508S	3.0 BIOC 511S	2.0
BIOC 600S	9.0 BIOC 521S	2.0
IDPT 500S	2.0 BIOC 600S	9.0
	16	15

Fifth Year

Fall	Credits Spring	Credits
BIOC 506S	1.0 BIOC 506S	1.0
BIOC 507S	1.0 BIOC 507S	1.0
BIOC 600S	9.0 BIOC 600S	9.0

Advanced Elective	3.0 Advanced Elective	3.0
		14

Sixth Year

Fall	Credits Spring	Credits
BIOC 506S	1.0 IDPT 600S	9.0
BIOC 507S	1.0	
BIOC 600S	9.0	
		9

Seventh Year

Fall	Credits Spring	Credits
Fourth Year MD Curriculum	Fourth Year MD Curriculum	
		0

Total Credits 79

MD/PhD in Microbiology & Immunology

First Year

Fall	Credits Spring	Credits
First Year MD Curriculum	First Year MD Curriculum	
		0

Second Year

Fall	Credits Spring	Credits
Second Year MD Curriculum	Second Year MD Curriculum	
		0

Third Year

Fall	Credits Spring	Credits
Third Year MD Curriculum	Third Year MD Curriculum	
		0

Fourth Year

Fall	Credits Spring	Credits
IDPT 500S	2.0 MIIM 502S	1.0
MIIM 502S	1.0 MIIM 514S	2.0
MIIM 600S	9.0 MIIM 600S	9.0
MIIM 606S	1.0 MIIM 606S	1.0
Advanced Elective	2.0 Advanced Elective	2.0
		15

Fifth Year

Fall	Credits Spring	Credits
MIIM 502S	1.0 MIIM 502S	1.0
MIIM 600S	9.0 MIIM 600S	9.0
MIIM 606S	1.0 MIIM 606S	1.0
		11

Sixth Year

Fall	Credits Spring	Credits
MIIM 502S	1.0 IDPT 600S	9.0
MIIM 600S	9.0	
MIIM 606S	1.0	
		9

Seventh Year

Fall	Credits Spring	Credits
Fourth Year MD Curriculum	Fourth Year MD Curriculum	
		0

Total Credits 72

MD/PhD in Molecular & Cell Biology & Genetics

First Year

Fall	Credits Spring	Credits
First Year MD Curriculum	First Year MD Curriculum	
		0

Second Year

Fall	Credits Spring	Credits
Second Year MD Curriculum	Second Year MD Curriculum	
		0

Third Year

Fall	Credits Spring	Credits
Third Year MD Curriculum	Third Year MD Curriculum	
		0

Fourth Year

Fall	Credits Spring	Credits
IDPT 500S	2.0 MCBG 506S	2.0
MCBG 512S	1.0 MCBG 512S	1.0
MCBG 513S	1.0 MCBG 513S	1.0
MCBG 600S	9.0 MCBG 600S	9.0
Advanced Elective	3.0 Advanced Elective	2.0
		16

Fifth Year

Fall	Credits Spring	Credits
MCBG 512S	1.0 MCBG 512S	1.0
MCBG 513S	1.0 MCBG 513S	1.0
MCBG 600S	9.0 MCBG 600S	9.0
Advanced Elective	2.0	
		13

Sixth Year

Fall	Credits Spring	Credits
MCBG 512S	1.0 IDPT 600S	9.0
MCBG 513S	1.0	
MCBG 600S	9.0	
		11

Seventh Year

Fall	Credits Spring	Credits
Fourth Year MD Curriculum	Fourth Year MD Curriculum	
		0

Total Credits 75

MD/PhD in Neuroscience

First Year		
Fall	Credits Spring	Credits
First Year MD Curriculum	First Year MD Curriculum	
	0	0
Second Year		
Fall	Credits Spring	Credits
Second Year MD Curriculum	Second Year MD Curriculum	
	0	0
Third Year		
Fall	Credits Spring	Credits
Third Year MD Curriculum	Third Year MD Curriculum	
	0	0
Fourth Year		
Fall	Credits Spring	Credits
IDPT 500S	2.0 NEUR 500S	2.0
NEUR 520S	2.0 NEUR 521S	2.0
NEUR 600S	9.0 NEUR 600S	9.0
NEUR 609S	4.0 Advanced Elective	1.0-4.0
	17	14-17
Fifth Year		
Fall	Credits Spring	Credits
NEUR 520S	2.0 NEUR 521S	2.0
NEUR 600S	9.0 NEUR 600S	9.0
	11	11
Sixth Year		
Fall	Credits Spring	Credits
NEUR 520S	2.0 IDPT 600S	9.0
NEUR 600S	9.0	
	11	9
Seventh Year		
Fall	Credits Spring	Credits
Fourth Year MD Curriculum	Fourth Year MD Curriculum	
	0	0

Total Credits 73-76

MD/PhD in Pharmacology & Physiology

First Year		
Fall	Credits Spring	Credits
First Year MD Curriculum	First Year MD Curriculum	
	0	0
Second Year		
Fall	Credits Spring	Credits
Second Year MD Curriculum	Second Year MD Curriculum	
	0	0
Third Year		
Fall	Credits Spring	Credits
Third Year MD Curriculum	Third Year MD Curriculum	
	0	0

Fourth Year		
Fall	Credits Spring	Credits
IDPT 500S	2.0 PHRM 502S	1.0
PHRM 502S	1.0 PHRM 517S	1.0
PHRM 516S	1.0 PHRM 600S	9.0
PHRM 600S	9.0 Advanced Elective	2.0
	13	13
Fifth Year		
Fall	Credits Spring	Credits
PHRM 502S	1.0 PHRM 502S	1.0
PHRM 507S	3.0 PHRM 600S	9.0
PHRM 600S	9.0	
Advanced Elective	2.0	
	15	10
Sixth Year		
Fall	Credits Spring	Credits
PHRM 502S	1.0 IDPT 600S	9.0
PHRM 600S	9.0	
	10	9
Seventh Year		
Fall	Credits Spring	Credits
Fourth Year MD Curriculum	Fourth Year MD Curriculum	
	0	0
Total Credits 70		