



Montclair State University
Department of Physics and Astronomy
BS Physics Pre-Med Concentration

I. GenEd Requirement	32 sh		
A. New Student Seminar	1		
C. Communication	9		
C1. Writing			
C2. Literature			
C3. Communication			
D. Fine and Performing Arts	3		
F. Humanities	6		
F1. Great Works and Their Influences			
F2. Philosophical and Religious Perspectives			
G. Computer Science	<i>CSIT 104</i>	(0)	
H. Mathematics	<i>MATH 122 or AMAT 120</i>	(0)	
I. Natural Science Laboratory	<i>PHYS 191</i>	(0)	
J. Physical Education	1		
K. Social Science	9		
K1. American and European History			
K2. Global Cultural Perspectives (<i>Select one course from attached list to also satisfy II.B. World Cultures.</i>)			
K3. Social Science Perspectives	<i>PSYC 101</i>		
L. Interdisciplinary Studies	3		
II. World Languages and Cultures Requirement	3-6 sh		
A. World Languages	3-6		
B. World Cultures	(0)		
(Some World Cultures courses may fulfill Gen Ed requirements.)			
III. Major Requirements	80-81 sh		
A. Physics Core	(32 sh)		
PHYS 191 University Physics I	4		
PHYS 192 University Physics II	4		
PHYS 198 Introductory Physics Seminar	1		
PHYS 210 Intermediate Mechanics	3		
PHYS 220 Oscillations, Waves, & Optics	3		
PHYS 230 Intermediate Physics Laboratory	4		
PHYS 320 Statistical and Thermal Physics	3		
PHYS 330 Advanced Physics Laboratory	4		
PHYS 340 Electricity and Magnetism	3		
PHYS 360 Modern Physics	3		
B. Concentration Requirements	(22 sh)		
PHYS 452 Medical Physics Seminar	3		
CHEM 230 Organic Chem I	3		
CHEM 231 Organic Chem II	3		
CHEM 232 Exp. Organic Chem	2		
CHEM 370 Biochemistry	3		
BIOL 112 Principles of Biology I	4		
BIOL 113 Principles of Biology II	4		
PSYC 101 Intro to Psychology (Gen Ed K3 req)	(0)		
C. Physics Electives	(3-4 sh)		
Select 3 - 4 sh from the following:			
PHYS 451 Radiation and Medical Physics	3		
PHYS 245 Fundamentals of Electronics	4		
PHYS 325 Computational Physics	3		
PHYS 341 Electronics and Digital Circuits	4		
PHYS 350 Modern Optics	4		
PHYS 368 Fluid Mechanics	3		
PHYS 377 Mathematical Physics	3		
PHYS 399 Special Topics in Physics	1-4		
PHYS 462 Nuclear Physics	4		
PHYS 464 Quantum Mechanics	3		
PHYS 495 Research/Independ. Study in Physics	1-4		
<i>(PHYS 451 is recommended if offered.)</i>			
D. Collateral Requirements	(23 sh)		
CSIT 104 Computational Concepts	3		
CHEM 120 General Chemistry I	4		
CHEM 121 General Chemistry II	4		
MATH 122 Calc. I or AMAT 120 Applied Calc. A	4		
MATH 221 Calc. II or AMAT 220 Applied Calc. B	4		
MATH 222 Calculus III	4		
IV. Free Electives	1 - 5 sh		
Any catalog course may be chosen, but the courses below are recommended as preparation for medical school:			
BIOL 230 Cell & Molec Biology	4		
BIOL 380 Genetics	4		
BIOL 440 Gross Mammalian Anatomy	4		
BIOL 442 Human Physiology	4		
BIOL 445 Immunology	3		
BIOL 446 Endocrinology	3		
BIOL 447 Fundamentals of Pharmacology	3		
BIOL 468 Neurobiology	3		
BIOL 475 Medical Genetics	3		
BIOL 476 Biology of Cancer	3		
CHEM 371 Biochemistry II	3		
CHEM 372 Experimental Biochemistry I	2		
CHEM 373 Experimental Biochemistry II	3		
MATH 242 Biostatistics	3		
SOCI 100 Intro to Sociology	3		
Total required for graduation	120 sh		

Suggested Sequence for Four-Year Plan

First Year

Fall	Total: 16cr	Spring	Total: 16cr
I. PHYS 191 University Physics I (4) H. MATH122 Calc I or AMAT120 App Calc A(4)* BIOL 112 Principles of Biology I (4) C1. Writing (3) A. New Student Seminar (1)		PHYS 192 University Physics II (4) PHYS 198 Introductory Physics Seminar (1) MATH 221 Calc II or AMAT 220 App Calc B (4) BIOL 113 Principles of Biology II (4) C2. Literature (3)	

Second Year

Fall	Total: 17cr	Spring	Total: 13cr
PHYS 210 Intermediate Mechanics (3)** MATH 222 Calculus III (4) CHEM 120 General Chemistry I (4) C3. Communication (3) D. Fine & Performing Arts (3)		PHYS 340 Electricity and Magnetism (3)** PHYS 320 Statistical and Thermal Physics (3)** CHEM 121 General Chemistry II (4) G. CSIT 104 Computational Concepts (3)	

Third Year

Fall	Total: 15cr	Spring	Total: 15cr
PHYS 220 Oscillations, Waves, & Optics (3)** PHYS 230 Intermediate Physics Lab (4) CHEM 230 Organic Chem I (3) CHEM 232 Exp. Organic Chem. (2) World Language I (3)		PHYS 360 Modern Physics (3)** CHEM 231 Organic Chem II (3) F1. Great Works and Their Influences (3) F2. Philosophical & Religious Perspectives (3) World Language II/Free Elective (3)	

Fourth Year

Fall	Total: 16cr	Spring	Total: 12cr
PHYS 452 Medical Physics Seminar (3) PHYS 330 Advanced Physics Lab (4) CHEM 370 Biochemistry (3) K3. PSYC 101 Intro to Psychology (3) L. Interdisciplinary Studies (3)		PHYS 451 Rad. Med. Phys. or Phys. elective (3-4) K1. American & European History (3) K2. Global Cultural Perspec./World Cultures*** (3) Free Elective (1-2) Physical Education Requirement (1)	

Note: After Year 1, General Education, World Languages/Cultures, and free electives can be taken in any sequence.

*Students who do not have a strong (4 year) background in high school mathematics, including exponential, logarithmic, and trigonometric functions are advised to take MATH 111 Applied Precalculus before Calculus I.

** The PHYS 210, 320, 340 and PHYS 220, 360 sequences are offered in alternate years and can be taken in Year 2 or Year 3. Most 200-level and higher physics courses are offered on an alternate-year schedule.

*** GenEd Category K2 & World Cultures double-dip: ANTH 100, 115, 120, 130, 140, 150, ARAB 193, ARHT 101, DNCE 145, FREN/FRIN 283, 289, GSWS 200, HUMN 217, 289, HIST 108, 114, 132, 138, LALS 201, 205, PHIL 237, POLS 206, RELG 240, 250, 252, 254