MONTCLAIR STATE UNIVERSITY

Montclair State University
Department of Physics and Astronomy
BS Physics w/ Concentration in Astronomy

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 *CSIT 104*	(0)
H.	Mathematics *MATH 122 or AMAT 120*	(0)
I.	Natural Science Laboratory *PHYS 191*	(0)
J.	Physical Education	1
K.	Social Science	9
	K1. American and European History	
	K2. Global Cultural Perspectives *(Select one course from attached list to also satisfy II.B. World Cultures.)*	
	K3. Social Science Perspectives	
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 **78 - 82 sh**

A. Physics Core **(36 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 300 Junior/Senior Physics Seminar	1
PHYS 320 Statistical and Thermal Physics	3
PHYS 330 Advanced Physics Laboratory	4
PHYS 340 Electricity and Magnetism	3
PHYS 360 Modern Physics	3
PHYS 464 Quantum Mechanics	3

B. Physics Electives **(16-19 sh)**

Select a minimum of 10 sh from the list below (10-11sh):
(concentration electives)

PHYS 280 Astronomy for Physicists	4
PHYS 380 Observational Astronomy	4
PHYS 480 Astrophysics	3
PHYS 461 Special & General Relativity	3

Select a minimum of 6 sh from the list below (6 - 8 sh):
(additional electives)

PHYS 245 Fundamentals of Electronics	4
PHYS 325 Computational Physics	3
PHYS 310 Advanced Mechanics	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 470 Solid State Physics	3
PHYS 495 Research/Indep. Study in Physics	1-4
AMAT 345 Applied Probability	3
AMAT 450 Applied Mathematics II	3
MATH 460 Intro to Applied Mathematics	3
STAT 230 Data Science and Statistics	3

C. Collateral Requirements **(26-27 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

and choose one of the following options:

AMAT 350 Applied Mathematics I	3
or PHYS 377 Mathematical Physics	3
or MATH 325 Differential Equations	4

IV. Free Electives **0 - 7 sh**

Minimum total required for graduation **120 sh**

Revised May 1, 2020

Suggested Sequence for Four-Year Plan

First Year

Fall	Total:15cr	Spring	Total:15cr
I. PHYS 191 University Physics I (4) H. MATH122 Calc I or AMAT120 App Calc A(4)* G. CSIT 104 Computational Concepts (3) 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) C2. Literature (3) C3. Communication (3)	

Second Year

Fall	Total:15cr	Spring	Total:13cr
PHYS 210 Intermediate Mechanics (3)** MATH 222 Calculus III (4) CHEM 120 General Chemistry I (4) PHYS 280 Astronomy for Physicists (4)		PHYS 340 Electricity and Magnetism (3)** PHYS 320 Statistical and Thermal Physics (3)** AMAT 350 or PHYS 377 (3) [or MATH 325 (4)] CHEM 121 General Chemistry II (4)	

Third Year

Fall	Total:14cr	Spring	Total:15-16cr
PHYS 220 Oscillations, Waves, & Optics (3)** PHYS 230 Intermediate Physics Lab (4) PHYS 300 Junior/Senior Physics Seminar (1) PHYS 461 Special & General Relativity (3) World Language I (3)		PHYS 360 Modern Physics (3)** Physics Elective (3-4) 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:16-17cr
PHYS 464 Quantum Mechanics (3) PHYS 330 Advanced Physics Lab (4) PHYS 480 Astrophysics (3) D. Fine & Performing Arts (3) K3. Social Science Perspectives (3)		Physics Elective (3-4) K1. American & European History (3) K2. Global Cultural Perspec./World Cultures (3)*** L. Interdisciplinary Studies (3) Free Elective (2-4) J. Physical Education (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