BSA-Chemistry, Math, Physics

Fall 2023

Bachelor of Science and Arts (BSA)

Mellon College of Science (MCS) Concentrations

Chemistry **118 units minimum**

Advisor: Karen Stump, DH 1316, 412-268-2340
ks01@andrew.cmu.edu

Chemistry Required Courses		**100 units**
09-106	Modern Chemistry II	10
09-219	Modern Organic Chemistry	10
09-220	Modern Organic Chemistry II	10
09-331	Modern Analytical Instrumentation	9
09-348	Inorganic Chemistry	10
09-221	Laboratory I: Introduction to Chemical Analysis	12
09-222	Laboratory II: Organic Synthesis and Analysis	12
09-321	Laboratory III: Molecular Design and Synthesis	12
or 09-323	Bioorganic Chemistry Laboratory	
09-201, 202 & 301	Undergraduate Seminars (1 unit each)	3
09-402	Undergraduate Seminar VI	3
33-122	Physics II for Bio. Sciences and Chemistry Students	9

Note: Students who have a strong chemistry background, should enroll in 09-107 rather than 09-105. Students who complete 09-107 with an "A" grade will be exempted from the requirement to take 09-106 Modern Chemistry II.

Advanced Chemistry Electives (2 courses) **18 units**
May be any upper level chemistry course, 09-3xx or higher, or Biochemistry I, 03-231 or 03-232, with the exception of 09-435, Independent Study, which can be used only by permission of the Director of Undergraduate Studies.

Mathematical Sciences **127 units minimum**

Advisor: David Offner, WEH 6117, 412-268-9657
doffner@andrew.cmu.edu

Mathematical Sciences Required Courses		**91 units**
15-110	Principles of Computing	10
21-127	Concepts of Mathematics	12
or 21-128	Mathematical Concepts and Proofs	
21-228	Discrete Mathematics	9
21-241	Matrices and Linear Transformations	11
or 21-242	Matrix Theory	
21-259	Calculus in Three Dimensions	10
or 21-268	Multidimensional Calculus (11)	
21-260	Differential Equations	9
or 21-261	Introduction to Ordinary Differential Equations (10)	
or 33-231	Physical Analysis (10)	
21-355	Principles of Real Analysis I	9
21-373	Algebraic Structures	9
33-142	Physics II for Engineering and Physics Students	12
or 33-152	Matter and Interactions II	

Mathematical Sciences Electives (2 courses) **18 units**
Students with a Music concentration should take 21-469 Computational Introduction to Partial Differential Equations.

Mathematical Sciences, Statistics, or Computer Science Electives (2 courses) **18 units**
May be computer science course above the 100-level, mathematical science courses beyond the calculus sequence, and statistics courses at the level of 36-225 or higher.

Physics **145 units minimum**

Advisor: Gillian Lynn Ryan, WEH 7303
gryan@andrew.cmu.edu

Physics Required Courses		**127 units**
21-259	Calculus in Three Dimensions	10
33-104	Experimental Physics	9
33-142	Physics II for Engineering and Physics Students	12
or 33-152	Matter and Interactions II	
33-201	Physics Sophomore Colloquium I (Fall)	2
33-202	Physics Sophomore Colloquium II (Spring)	2
33-211	Physics III: Modern Essentials	10
33-228	Electronics I	10
33-231	Physical Analysis	10
33-232	Mathematical Methods of Physics	10
33-234	Quantum Physics	10
33-301	Physics Upperclass Colloquium I (Fall)	1
33-302	Physics Upperclass Colloquium II (Spring)	1
33-331	Physical Mechanics I	10
33-338	Intermediate Electricity and Magnetism I	10
33-340	Modern Physics Laboratory	10
33-341	Thermal Physics I	10

Qualifying Physics Electives (2 courses) **18 units**
Two 33-xxx qualifying physics elective courses pre-approved by the Physics Department. 33-114 Physics of Musical Sound is highly recommended for students with a Music concentration.

BSA Free Electives
Take any Carnegie Mellon course. A maximum of 9 units of physical education and/or military science may be counted toward this requirement.