

# Mathematics and Physics

## Mathematics and Physics

This program is intended for students who desire additional mathematical background and preparation for graduate school or technical careers in the sciences, especially theoretical physics.

## Major Requirements

### Major: Mathematics & Physics

**Degree Type: B.A. or B.S.**

**Required Degree Credits to Graduate: 132**

### General Education Requirements

#### First Year Experience (F):

UNIV 189	Skills For Academic Success (Students transferring in 24 or more credits do not need to take UNIV 189.)	1
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#### Communication (C):

ENGL 110	College Composition I	3
ENGL 120	College Composition II	3

One Course in Upper Level Writing: Select from current general education list 3

COMM 110	Fundamentals of Public Speaking	3
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#### Quantitative Reasoning (R):

MATH 165	Calculus I	4
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#### Science & Technology (S):

PHYS 251 & 251L	University Physics I and University Physics I Laboratory	5
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PHYS 252 & 252L	University Physics II and University Physics II Laboratory	5
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**Humanities & Fine Arts (A): Select from current general education list** 6

**Social & Behavioral Sciences (B): Select from current general education list** 6

**Wellness (W): Select from current general education list** 2

**Cultural Diversity (D): Select from current general education list**

**Global Perspectives (G): Select from current general education list**

Total Credits 41

## College Requirements

**Bachelor of Science (BS) Degree** – An additional 6 credits in Humanities or Social Sciences\*

**Bachelor of Arts (BA) Degree** – An additional 12 credits Humanities and Social Sciences\* and proficiency at the second year level in a modern foreign language.

\* Humanities and Social Sciences may be fulfilled by any course having the following prefix: ADHM, ANTH, ARCH, ART, CJ, CLAS, COMM, ECON, ENGL, FREN, GEOG, GERM, HDFS, HIST, LA, LANG, MUSC, PHIL, POLS, PSYC, RELS, SOC, SPAN, THEA, WGS, or any course

from the approved list of general education courses in humanities and social sciences (general education categories A and B). These credits must come from outside the department of the student's major.

## Major Requirements

A grade of 'C' or better is required for all MATH, PHYS, and AST prefix courses.

**General Education Requirements** 40

**College of Science and Mathematics Requirements** 6-12

### Mathematics Major Requirements

MATH 166	Calculus II	4
MATH 265	Calculus III	4
MATH 266	Introduction to Differential Equations	3
MATH 270	Introduction to Abstract Mathematics	3
MATH 420	Abstract Algebra I	3
MATH 429	Linear Algebra	3
MATH 450	Real Analysis I	3
MATH 421	Abstract Algebra II	3
or MATH 451	Real Analysis II	
MATH 491	Seminar	2
Mathematics Electives	Any MATH prefix course 400-level or higher (MATH 488 & MATH 489 are recommended)	6

### Physics Major Requirements

PHYS 171	Introductory Projects in Physics	1
PHYS 251R	University Physics I Recitation	1
PHYS 252R	University Physics II Recitation	1
PHYS 350	Modern Physics	3
PHYS 360	Modern Physics II	3
PHYS 361	Electromagnetic Theory (or PHYS 370: Electromagnetic Theory (MSUM))	3-4
PHYS 370	Introduction to Computational Physics	3
Select one of the following:		3-4
PHYS 455	Classical Mechanics	
PHYS 330	Intermediate Mechanics (MSUM)	
PHYS 462	Heat & Thermodynamics	3
PHYS 485	Quantum Mechanics I	3
PHYS 486	Quantum Mechanics II	3
PHYS 489	Physics Projects	3

Physics Electives: Select 3 of the following: 9

PHYS 215	Research For Undergraduates	
PHYS 411	Optics for Scientists & Engineers	
PHYS 413	Lasers for Scientists and Engineers	
PHYS 415	Elements of Photonics	
PHYS 463	Statistical Mechanics	
PHYS 481	Introduction to Solid State Physics	
MSUM AST	Astronomy courses (300/400-level) with departmental permission	

### Related Required Courses

Computer Science:		
CSCI 160	Computer Science I	4
Chemistry: Select one of the following (150/160 recommended): 4		
CHEM 150 & CHEM 160	Principles of Chemistry I and Principles of Chemistry Laboratory I	

CHEM 121 & 121L	General Chemistry I and General Chemistry I Laboratory	
Select one of the following (151/161 recommended):		4
CHEM 151 & CHEM 161	Principles of Chemistry II and Principles of Chemistry Laboratory II	
CHEM 122 & 122L	General Chemistry II and General Chemistry II Laboratory	
<hr/> Total Credits		132-140

### **Program Notes**

- Except for courses offered only as pass/fail grading, no course may be taken Pass/Fail.