

**COLLEGE OF SCIENCE & MATHEMATICS**

**MAJOR: MATHEMATICS & PHYSICS**

**ACADEMIC YEAR: 2013-2014**

**DEGREE TYPE: B.A. or B.S.**

**REQUIRED DEGREE CREDITS TO GRADUATE: 132**

**GENERAL EDUCATION REQUIREMENTS – 40 CREDITS**

**Lower Division Requirements – 37 Credits**

First Year Experience (F) - 1 Credit

UNIV	189	Skills for Academic Success	1 cr
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Students transferring in 24 or more credits do not need to take UNIV 189.

Communication (C) - 9 Credits

ENGL	110	College Composition I	3 cr
ENGL	120	College Composition II	3 cr
COMM	110	Fund of Public Speaking	3 cr

Quantitative Reasoning (R) - 3 Credits

MATH	165	Calculus I	4 cr
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Science & Technology (S) - 10 Credits

PHYS	251/L	University Physics I/Lab	4/1 cr
PHYS	252/L	University Physics II/Lab	4/1 cr

Humanities & Fine Arts (A) - 6 Credits

Select from current general education courses [www.ndsu.edu/registrar/gened/](http://www.ndsu.edu/registrar/gened/)

Social & Behavioral Sciences (B) - 6 Credits

Select from current general education courses [www.ndsu.edu/registrar/gened/](http://www.ndsu.edu/registrar/gened/)

Wellness (W) - 2 Credits

Select from current general education courses [www.ndsu.edu/registrar/gened/](http://www.ndsu.edu/registrar/gened/)

Cultural Diversity (D)

Select from current general education courses [www.ndsu.edu/registrar/gened/](http://www.ndsu.edu/registrar/gened/)

Global Perspectives (G)

Select from current general education courses [www.ndsu.edu/registrar/gened/](http://www.ndsu.edu/registrar/gened/)

**Upper Division Requirements - Writing – 3 Credits**

Select from current general education courses [www.ndsu.edu/registrar/gened/](http://www.ndsu.edu/registrar/gened/)

**MATH MAJOR REQUIREMENTS – 38 CREDITS** (includes MATH 165)

• A grade of 'C' or better is required for all MATH prefix courses.

MATH	166	Calculus II	4 cr
MATH	265	Calculus III	4 cr
MATH	266	Intro to Differential Equations	3 cr
MATH	270	Intro to Abstract Mathematics	3 cr
MATH	420	Abstract Algebra I	3 cr
MATH	429	Linear Algebra	3 cr
MATH	450	Real Analysis I	3 cr
MATH	421or 451	Abstract Algebra II Real Analysis II	3 cr
MATH	491	Capstone Seminar	2 cr

**Math Electives – 6 Credits:**

Choices must be from any MATH course 400 level or higher. MATH 488 & 489 are recommended.

**PHYSICS MAJOR REQUIREMENTS – 49-51 CREDITS** (includes PHYS 251/L & 252/L)

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

PHYS	171	Introductory Projects in Physics	1 cr
PHYS	251R	Univ. Physics I Recitation	1 cr
PHYS	252R	Univ. Physics II Recitation	1 cr
PHYS	350	Modern Physics	3 cr
PHYS	360	Modern Physics II	3 cr
PHYS	361 or 370	Electromagnetic Theory Electromagnetic Theory (MSUM)	3 or 4 cr
PHYS	370	Intro to Computational Physics	3 cr
PHYS	455 or 330	Classical Mechanics Intermediate Mechanics (MSUM)	3 or 4 cr
PHYS	462	Heat & Thermodynamics	3 cr
PHYS	485	Quantum Mechanics I	3 cr
PHYS	486	Quantum Mechanics II	3 cr
PHYS	489	Senior Project/Capstone	3 cr

**Physics Electives – 9 Credits – Select three courses from the following:**

PHYS	215	Research for Undergraduates	3 cr
PHYS	411	Optics for Scientists & Engineers	3 cr
PHYS	413	Lasers for Scientists & Engineers	3 cr
PHYS	415	Elements of Photonics	3 cr
PHYS	463	Statistical Mechanics	3 cr
PHYS	481	Intro to Solid State Physics	3 cr

OR

MSUM AST courses with departmental permission.

**RELATED REQUIRED COURSES – 12 CREDITS**

**Computer Science – 4 Credits**

CSCI	160	Computer Science I	4 cr
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**Chemistry– 8 Credits** (CHEM 150/151 sequence recommended)

CHEM	150/160 or 121/L	Principles of Chemistry I/Lab General Chemistry I/Lab	3/1 cr
CHEM	151/161 or 122/L	Principles of Chemistry II/Lab General Chemistry II/Lab	3/1 cr

**Additional degree requirements continued on page two.**

## **DEPARTMENT AND COLLEGE REQUIREMENTS**

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

**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.