

# Physics B.S.

## Physics Major

The B.S. Physics major requires a minimum of 120 total hours to graduate. This total includes UNIFI/General Education requirements and the following specified major requirements, plus electives to complete the minimum of 120 hours.

**Note:** To graduate with a B.S. degree in Physics, a student must earn an overall grade point average of at least 2.50 in all courses applied toward the major.

### Required

Mathematics:		
MATH 1420	Calculus I	4
MATH 1421	Calculus II	4
MATH 2422	Calculus III	4
Physics:		
PHYSICS 1100	First-Year Projects in Physics	1
PHYSICS 1701	Physics I for Science and Engineering	4
PHYSICS 1702	Physics II for Science and Engineering	4
PHYSICS 2300	Physics III: Theory and Simulation	3
PHYSICS 2700	Mathematical Methods of Physics & Engineering	3
PHYSICS 3000	Undergraduate Research in Physics @	2
or PHYSICS 3500	Internship in Applied Physics	
PHYSICS 3700	Physics Seminar	1
PHYSICS 4100/5100	Modern Physics	4
PHYSICS 4110/5110	Modern Physics Laboratory	2
PHYSICS 4300/5300	Introduction to Electronics	4
PHYSICS 4600/5600	Classical Mechanics	4
PHYSICS 4700/5700	Electrodynamics	4
PHYSICS 4860/5860	Computational Physics	3
PHYSICS 4900/5900	Thermodynamics and Statistical Mechanics	4
Electives		
Physics, Natural Science, or Math Electives *		4
<b>Total Hours</b>		<b>59</b>

\* Electives must be mathematics or science courses that count toward a major of the department offering the course. Electives should be selected with the advice of an academic adviser in Physics.

@This course meets the Bachelor of Science degree undergraduate research requirement.

## Honors Research

Students who complete a sustained research project in physics may be invited to do Honors Research. Students must first complete 4 credit

hours of PHYSICS 3000 Undergraduate Research in Physics and then 1 credit hour of PHYSICS 4990 Senior Thesis.

## Four-Year Plan

### Physics, B.S.

This is a sample plan of study with a suggested sequencing of classes for the major. University electives may be applied to earn additional academic majors, minors, or certificates. Students should regularly meet with their academic advisor to plan their specific semester schedule to include UNIFI/General Education program and/or university elective hours required.

Course	Title	Hour
<b>Freshman</b>		
<b>Fall</b>		
MATH 1420	Calculus I	4
PHYSICS 1100	First-Year Projects in Physics	1
PHYSICS 1701	Physics I for Science and Engineering (satisfies UNIFI: Scientific Reasoning)	4
UNIFI: Written Communication		3
UNIFI: Human Expression		3
<b>Hours</b>		<b>15</b>
<b>Spring</b>		
MATH 1421	Calculus II	4
PHYSICS 1702	Physics II for Science and Engineering	4
UNIFI: Oral Communication		3
UNIFI: Human Condition (Global)		3
<b>Hours</b>		<b>14</b>
<b>Sophomore</b>		
<b>Fall</b>		
MATH 2422	Calculus III	4
PHYSICS 2300	Physics III: Theory and Simulation	3
UNIFI: Human Condition (Domestic)		3
University Elective		6
<b>Hours</b>		<b>16</b>
<b>Spring</b>		
PHYSICS 4100/5100	Modern Physics	4
PHYSICS 4110/5110	Modern Physics Laboratory	2
PHYSICS 2700	Mathematical Methods of Physics & Engineering	3
UNIFI: Responsibility		3
University Elective		3
<b>Hours</b>		<b>15</b>
<b>Junior</b>		
<b>Fall</b>		
PHYSICS 3000	Undergraduate Research in Physics	2
PHYSICS 3700	Physics Seminar	1
PHYSICS 4300/5300	Introduction to Electronics (or PHYSICS 4700/5700 Electrodynamics)	4
PHYSICS 4600/5600	Classical Mechanics	4
UNIFI: Connect		3
<b>Hours</b>		<b>14</b>

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<b>Spring</b>		
PHYSICS 4900/5900	Thermodynamics and Statistical Mechanics	4
UNIFI: Connect		3
University Electives		10
<b>Hours</b>		<b>17</b>
<b>Senior</b>		
<b>Fall</b>		
PHYSICS 4700/5700	Electrodynamics (or PHYSICS 4300/5300 Introduction to Electronics)	4
UNIFI: Connect		3
University Electives		9
<b>Hours</b>		<b>16</b>
<b>Spring</b>		
PHYSICS 4800/5800	Quantum Mechanics (PHYSICS Elective)	4
PHYSICS 4860/5860	Computational Physics	3
UNIFI: Connect		3
University Electives		3
<b>Hours</b>		<b>13</b>
<b>Total Hours</b>		<b>120</b>

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## Learning Outcomes

### Physics, B.S.

- Apply Techniques of Experimental Physics
- Understand Principles of Theoretical Physics
- Apply Techniques of Computational Physics
- Integrate and Apply Classroom Learning
- Be Prepared for Employment or Graduate Study

A student who has earned a bachelor's degree in physics from the University of Northern Iowa must demonstrate competence at the introductory (second-year) level in all three content areas (experimental, theoretical, and computational) through course-level outcomes aligned with each branch. A successful B.S. student must also acquire and demonstrate skills in career preparation as well as advanced knowledge in three areas: classical mechanics, thermodynamics and statistical mechanics, and computational physics.

## Related Programs

- Biochemistry B.A. or B.S.
- Chemistry B.A. or B.S.