


























# PHYSICS, B.S.










 - General Education Course

 - Milestone course: a key success marker for your major. See your advisor to discuss the importance of this course in your plan of study.

## Major

The Core Curriculum is designed to foster critical thinking skills and introduce students to basic domains of thinking that transcend disciplines. The Core applies to all majors. Information on specific classes in the Core can be found at <https://www.marshall.edu/gened/>.

Code	Title	Credit Hours
<b>Core Curriculum</b>		
<i>Core 1: Critical Thinking</i>		
FYS 100	First Yr Sem Critical Thinking	3
MTH 229  	Calculus/Analytic Geom I (CT)	5
	Critical Thinking Course	3
<i>Core 2</i>		
ENG 101  	Beginning Composition	3
ENG 201  	Advanced Composition	3
	Core II Communication	3
MTH 229  	Calculus/Analytic Geom I (CT)	5
	Core II Humanities	3
	Core II Social Science	3
	Core II Fine Arts	3
PHY 211  & PHY 202 	University Physics I and General Physics I Laboratory (Core II Physical/Natural Science)	5
<i>Additional University Requirements</i>		
	Writing Intensive	3
	Writing Intensive	3
	Multicultural or International	3
PHY 491  & PHY 492 	Capstone and Capstone	2
<b>Major-Specific</b>		
PHY 211 	University Physics I	4
PHY 202  	General Physics I Laboratory	1
PHY 213 	University Physics II	4
PHY 204 	General Physics 2 Laboratory	1
PHY 304 	Optics	3
PHY 405 	Optics Lab	2
PHY 308	Thermal Physics	3
PHY 300 	Electricity & Magnetism	3
PHY 330 	Mechanics	3
PHY 320 	Intro Modern Physics	3
PHY 421 	Modern Physics Lab	2
PHY 442 	Quantum Mechanics	3
PHY 445	Math Methods of Physics	3
PHY 446	Math Methods of Physics II	3
PHY 302	Electricity & Magnetism II	3


PHY 443	Quantum Mechanics II	3
PHY 491  & PHY 492 	Capstone and Capstone	2
MTH 230  	Calculus/Analytic Geom II	4
MTH 231 	Calculus/Analytic Geom III	4
MTH 335	Ordinary Diff Equations	3
CHM 211 	Principles of Chemistry I (Recommended)	3
CHM 217 	Principles of Chem Lab I (Recommended)	2
CHM 212 	Principles Chemistry II (Recommended)	3
CHM 218 	Principles of Chem Lab II (Recommended)	2
PHY Elective		5
PHY 425 & PHY 444	Solid State Physics and Advanced Laboratory (Recommended)	
Free Elective		4
Free Elective		3
Free Elective		3


## Major Information

- Students are required to know and track their degree requirements for graduation or for entrance to a professional school.
- In addition to the Core General Education requirements, the College of Science requires 3 hours of Calculus, coursework listed as "elective" may vary for each student. Students are encouraged to use elective hours toward a 2nd minor or toward prerequisites.
- Students are strongly encouraged to select courses that meet two or more Core or College requirements. For example, a writing intensive literature course could satisfy the Core II humanities requirement as well as the university writing intensive requirement.
- Course offerings and course attributes are subject to change each semester. Please consult each semester's schedule of courses for availability and attributes.
- Math is based on an ACT Mathematics score of 27 or higher. Students with an ACT Mathematics score less than 27 will be placed in the appropriate prerequisite mathematics and science courses.
- In order to graduate, students must maintain a 2.00 Overall GPA and receive a grade of C or better in each course required for the major.
- Advanced physics courses are offered every two to three semesters; check with the Physics Department for availability.
- Let the Department Chair know if you have an interest in a particular elective course as soon as possible.

## Areas of Emphasis



















- Applied Physics, Emphasis (<http://catalog.marshall.edu/undergraduate/programs-az/science/physics/physics-bs/applied-physics-emphasis/>)
- Bio Physics, Emphasis (<http://catalog.marshall.edu/undergraduate/programs-az/science/physics/physics-bs/bio-physics-emphasis/>)
- Medical Imaging, Emphasis (<http://catalog.marshall.edu/undergraduate/programs-az/science/physics/physics-bs/medical-imaging-emphasis/>)
- Medical Physics, Emphasis (<http://catalog.marshall.edu/undergraduate/programs-az/science/physics/physics-bs/medical-physics-emphasis/>)









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## Four Year Plan

A course of study in physics, resulting in a B.S. degree in physics, prepares students for a wide variety of opportunities, such as engineering careers in the private sector, careers in the health professions, employment in industry and government laboratories, advanced technology jobs in science and technology related fields, and careers as science teachers. The B.S. degree program is also excellent preparation for advanced degrees in physics, astronomy, engineering, medicine, or law. Physics is designed for those who are interested in future study or work in a pure physics or physics-related field.

Course	Title	Credit Hours
<b>First Year</b>		
<b>First Semester</b>		
PHY 202  	General Physics I Laboratory	1
PHY 211 	University Physics I	4
MTH 229  	Calculus/Analytic Geom I (CT)	5
FYS 100	First Yr Sem Critical Thinking	3
ENG 101  	Beginning Composition	3
UNI 100	Freshman First Class	1
<b>Credit Hours</b>		<b>17</b>
<b>Second Semester</b>		
MTH 230  	Calculus/Analytic Geom II	4
PHY 204 	General Physics 2 Laboratory	1
PHY 213 	University Physics II	4
ENG 201  	Advanced Composition	3
Core I Critical Thinking		3
<b>Credit Hours</b>		<b>15</b>
<b>Second Year</b>		
<b>First Semester</b>		
MTH 231 	Calculus/Analytic Geom III	4
PHY 320 	Intro Modern Physics	3
PHY 421 	Modern Physics Lab	2
PHY 445	Math Methods of Physics	3
Core II Communication		3
<b>Credit Hours</b>		<b>15</b>
<b>Second Semester</b>		
PHY 446	Math Methods of Physics II	3
PHY 304 	Optics	3
PHY 405 	Optics Lab	2
MTH 335	Ordinary Diff Equations	3
Core II Social Science		3
Writing Intensive Elective		3
<b>Credit Hours</b>		<b>17</b>
<b>Third Year</b>		
<b>First Semester</b>		
PHY 308	Thermal Physics	3
PHY 330	Mechanics	3

PHY 300 	Electricity & Magnetism	3
Writing Intensive Elective		3
Free Elective		3
<b>Credit Hours</b>		<b>15</b>
<b>Second Semester</b>		
PHY 302	Electricity & Magnetism II	3
PHY 442 	Quantum Mechanics	3
Core II Humanities		3
Multicultural or International		3
Core II Fine Arts		3
<b>Credit Hours</b>		<b>15</b>
<b>Fourth Year</b>		
<b>First Semester</b>		
PHY 443	Quantum Mechanics II	3
PHY 491 	Capstone	1
CHM 211 	Principles of Chemistry I (Recommended)	3
CHM 217 	Principles of Chem Lab I (Recommended)	2
PHY Elective:		5
PHY 425 & PHY 444	Solid State Physics and Advanced Laboratory (Recommended)	
<b>Credit Hours</b>		<b>14</b>
<b>Second Semester</b>		
CHM 212 	Principles Chemistry II (Recommended)	3
CHM 218 	Principles of Chem Lab II (Recommended)	2
PHY 492 	Capstone	1
Free Elective		4
Free Elective		3
<b>Credit Hours</b>		<b>13</b>
<b>Total Credit Hours</b>		<b>121</b>