Program Coordinator: C. Fay

The Physics major is offered as either a Bachelor of Science or Bachelor of Arts degree.

**Bachelor of Science Degree in Physics**
Physics is the study of the physical world including all matter and energy. The Bachelor of Science degree is a rigorous program consisting of 50 semester hours of science and mathematics in addition to Core Curriculum courses. It includes a minor in mathematics with 32 elective hours available to the student for another major or minor. Alternatively, the student can double major in Physics and Mathematics with enough hours still available for a minor or electives.

This degree is ideal preparation for graduate study in physics and related fields such as medical physics, astrophysics, applied mathematics, and engineering. It also prepares students for any career field that requires rigorous analytical and mathematical thinking. Students will be able to solve quantitative problems, have a basic knowledge of the major areas of physics, be able to express themselves in a professional manner, and understand experimental techniques and data analysis. Students normally spend one summer doing research and may be published authors before graduation. Academic credit is usually available for internship or research efforts.

**Core Curriculum Requirements**
Physics majors should fulfill specified categories of the King Core Curriculum by taking the courses indicated below. See the “The Core Curriculum” section of the catalog for additional details.

**Science**
CHEM 1110
General Chemistry I .................................................................4 s.h.

**Quantitative Literacy**
MATH 2350
Calculus I .................................................................4 s.h.

**Physics BS Major Requirements**
PHYS 2210
General Physics I .................................................................4 s.h.
PHYS 2220
General Physics II .................................................................4 s.h.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 3010</td>
<td>Theoretical Mechanics</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>PHYS 3030</td>
<td>Electricity and Magnetism</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>PHYS 3060</td>
<td>Introduction to Modern Physics</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>PHYS 3502</td>
<td>Experimental Methods</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>PHYS 4201</td>
<td>Advanced Topics</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>PHYS 4080</td>
<td>Introductory Quantum Mechanics</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>CHEM 4000</td>
<td>Physical Chemistry I</td>
<td>5 s.h.</td>
</tr>
<tr>
<td>PHYS 3052</td>
<td>Optics</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>PHYS 3072</td>
<td>Heat and Thermodynamics</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>PHYS 3401</td>
<td>Medical Physics</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>MATH 2450</td>
<td>Linear Algebra</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>MATH 2360</td>
<td>Calculus II</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>MATH 2370</td>
<td>Vector Calculus</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>MATH 3430</td>
<td>Differential Equations</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>IDST 4500</td>
<td>Interdepartmental Math and Science Seminar</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>PHYS 4990</td>
<td>Comprehensive Assessment</td>
<td>0 s.h.</td>
</tr>
</tbody>
</table>

**Choose from the following courses** .............................................. 4 s.h.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 2370</td>
<td>Calculus II</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>MATH 3430</td>
<td>Differential Equations</td>
<td>4 s.h.</td>
</tr>
</tbody>
</table>

**Summary of Total Credits**

Core Curriculum.................................................................................... 42 s.h.
Major Requirements*........................................................................... 50 s.h.
Electives/Minor/2\textsuperscript{nd} Major**.................................... 32 s.h.

Minimum to Earn Bachelor of Science .............................................. 124 s.h.

* This includes the minor in Mathematics.
** A double major in Physics and Mathematics allows for 16 s.h. of electives or another minor.
**Bachelor of Arts Degree in Physics**

Physics is the study of the physical world including all matter and energy. The Bachelor of Arts degree is a rigorous program consisting of 42 semester hours of science and mathematics beyond the core requirements, and one course in Technical Communication.

This degree is ideal preparation for many technical careers especially those that require rigorous analytical and quantitative thinking. It is also appropriate for a student desiring to become a teacher at the middle and senior high school level (with licensure). Students will be able to solve quantitative problems, have a basic knowledge of the major areas of physics, be able to express themselves in a professional major, and understand experimental techniques and data analysis.

Students frequently spend one summer doing research or internships and may be published authors before graduation. Academic credit is usually available for research and internship efforts.

**Physics BA Major Requirements**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 2210</td>
<td>General Physics I and II</td>
<td>4, 4 s.h.</td>
</tr>
<tr>
<td>PHYS 2220</td>
<td>General Physics II</td>
<td>4, 4 s.h.</td>
</tr>
<tr>
<td>PHYS 3010</td>
<td>Theoretical Mechanics</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>PHYS 3030</td>
<td>Electricity and Magnetism</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>PHYS 3060</td>
<td>Introduction to Modern Physics</td>
<td>4 s.h.</td>
</tr>
<tr>
<td>PHYS 3502</td>
<td>Experimental Methods</td>
<td>2 s.h.</td>
</tr>
<tr>
<td>PHYS 4201</td>
<td>Advanced Topics</td>
<td>2 s.h.</td>
</tr>
</tbody>
</table>

Choose from the following courses ....................................................... 4 s.h.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 1500</td>
<td>Cryptology: The Science of Secret Writing (4 s.h.)</td>
<td></td>
</tr>
<tr>
<td>MATH 2100</td>
<td>Programming with Graphics, Symbols, and Text (2 s.h.)</td>
<td></td>
</tr>
<tr>
<td>MATH 2480</td>
<td>History of Mathematics (2 s.h.)</td>
<td></td>
</tr>
<tr>
<td>MATH 3120</td>
<td>Number Theory (2 s.h.)</td>
<td></td>
</tr>
</tbody>
</table>

TCOM 2200

Technical Communication .......................................................... 4 s.h.

BIOL 2110

General Biology I ................................................................. 4 s.h.

MATH 2360

Calculus II ................................................................. 4 s.h.

IDST 4500

Interdepartmental Science and Math Seminar ............................ 2 s.h.
PHYS 4990
  Comprehensive Assessment......................................................0 s.h.

Summary of Total Credits
Core Curriculum.............................................................................42 s.h.
Major Requirements .......................................................................43 s.h.
Second Major/minors/Electives ....................................................39 s.h.
Minimum to Earn Bachelor of Arts..............................................124 s.h.

Teacher Education - PHYSICS
Tennessee teaching licensure (Grades 6-12) is available with modifications to the Physics major and the King Core, and successful completion of the Secondary Education minor. Licensed teachers in secondary education are in great demand in all fifty states, and the areas of science, mathematics, English as a second language, and foreign languages are considered a critical need areas in K-12 public education by all states.

Declaration of the minor and early and frequent advisement is essential to timely completion of degree and licensure requirements. Students seeking teacher licensure will be assigned a secondary education advisor in the Department of Teacher Education, in addition to their major advisor. See the “Admission to the Teacher Education Program” section of this catalog or contact the Administrative Assistant in School of Education for eligibility criteria, admissions procedures, and timelines.

Core Curriculum Requirements
Physics majors seeking teaching licensure should fulfill specified categories of the King Core Curriculum by taking the courses indicated below. See the “The Core Curriculum” section of the catalog for additional details.

Science
CHEM 1110
  General Chemistry I .................................................................4 s.h.

Quantitative Literacy
MATH 2350
  Calculus I ..................................................................................4 s.h.

Literature
Choose from the following courses (pair with history).................4 s.h.
ENGL 2171
  Connections in Western Literature I (4 s.h.)
ENGL 2172
  Connections in Western Literature II (4 s.h.)
History
Choose from the following courses (pair with literature)............4 s.h.
  HIST 2171
  Western Civilization in Global Context I (4 s.h.)
  HIST 2172
  Western Civilization in Global Context II (4 s.h.)

Human Culture
In addition to satisfying the language requirement:
  PSCI 2120
  Cultural Diversity in America........................................4 s.h.

BA in Physics Major Requirements for Teaching Licensure
  PHYS 2210 and 2220
  General Physics I and II ..............................................4, 4 s.h.
  PHYS 3010
  Theoretical Mechanics ...............................................4 s.h.
  PHYS 3030
  Electricity and Magnetism ...........................................4 s.h.
  PHYS 3060
  Introduction to Modern Physics ....................................4 s.h.
  PHYS 3502
  Experimental Methods ................................................2 s.h.
  PHYS 4201
  Advanced Topics ................................................................2 s.h.
Choose from the following courses .....................................4 s.h.
  BIOL 2110
  General Biology I (4 s.h.)
  BIOL 2120
  General Biology II (4 s.h.)
Choose from the following courses .....................................4 s.h.
  DMIS 2015
  Introduction to Computer Science (4 s.h.)
  MATH 1500
  Cryptology: The Science of Secret Writing (4 s.h.)
  MATH 2100
  Programming with Graphics, Symbols, & Text (2 s.h.)
  MATH 2480
  History of Mathematics (2 s.h.)
  MATH 3120
  Number Theory (2 s.h.)
  IDST 4500
  Interdepartmental Science and Math seminar .....................2 s.h.
  MATH 2360
  Calculus II .......................................................................4 s.h.
  TCOM 2200
  Technical Communication ..............................................4 s.h.
Secondary Education Minor
EDUC 2030
   Introduction to Teaching, Grades K-12 .......................... 2 s.h.
EDUC 2031
   Introduction to Teaching Practicum, Grades PreK-12 .......... 1 s.h.
EDUC 2100
   Survey of Exceptional Children ........................................ 4 s.h.
EDUC 2370
   Reflective Teaching K-12 ............................................. 3 s.h.
EDUC 2900
   Foundations of Education ............................................. 3 s.h.
EDUC 2950
   Technology for Teachers ............................................. 2 s.h.
EDUC 3390*
   Secondary Curriculum and Methods................................. 3 s.h.
EDUC 3590*
   Content Area Reading ................................................. 3 s.h.
EDUC 3600*
   Assessment and Evaluation .......................................... 3 s.h.
EDUC 4490*
   Student Teaching, Grades 6-10 ....................................... 5 s.h.
EDUC 4500*
   Student Teaching, Grades 9-12 ....................................... 5 s.h.
EDUC 4950*
   Capstone Seminar, Grades K-12 ..................................... 2 s.h.
PSCI 2120
   Cultural Diversity in America ....................................... 4 s.h.
PSYC 3320
   Adolescent Development .............................................. 4 s.h.

*Requires admittance to the Teacher Education Program

Summary of Total Credits
Core Curriculum ..................................................................... 42 s.h.
Major Requirements ........................................................... 42 s.h.
Secondary Education Minor ............................................... 44 s.h.
Electives ............................................................................. 2 s.h.
Minimum to Complete Licensure Program ............................. 130 s.h.