Program Coordinator: C. Fay

The Physics major is offered as either a Bachelor of Science or Bachelor of Arts degree. The laws of physics established by our Creator make the discipline of physics relevant to all the natural sciences and bring understanding of nature as well as faith issues.

Student Learning Outcomes
1. Students will be able to solve quantitative physics problems.
2. Students will have a basic knowledge of key areas of physics: mechanics, electricity and magnetism, modern physics, optics, nuclear and atomic physics.
3. Students will demonstrate the ability to communicate scientific content orally and in writing.
4. Students will have command of basic experimental techniques, including data analysis.

At the end of the program of study, all students majoring in Physics will be required to pass a comprehensive assessment administered during PHYS 4900.

Bachelor of Science Degree in Physics with a minor in Mathematics
The Bachelor of Science Degree in Physics prepares students 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.

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. Students are encouraged to 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.
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.
PHYS 4080
    Introductory Quantum Mechanics ............ 4 s.h.

Choose from the following courses ................................ 4 s.h.
CHEM 4000
    Physical Chemistry I (5 s.h.)
PHYS 3052
    Optics (4 s.h.)
PHYS 3072
    Heat and Thermodynamics (4 s.h.)
PHYS 3401
    Medical Physics (4 s.h.)
PHYS 3500
    Computational Physics (4 s.h.)

MATH 2360
    Calculus II ........................................ 4 s.h.
MATH 2370
    Vector Calculus ................................... 4 s.h.
MATH 3430
    Differential Equations ........................ 4 s.h.

Choose from the following courses ................................ 4 s.h.
MATH 2450
    Linear Algebra (4 s.h.)
    MATH Elective, 3000 or 4000 level (4 s.h.)

IDST 4500
    Interdepartmental Math and Science Seminar .... 2 s.h.
PHYS 4990
    Comprehensive Assessment ........................ 0 s.h.
Summary of Total Credits
Core Curriculum ................................................................. 42 s.h.
Major Requirements* ........................................................ 50 s.h.
Electives/Minor/2nd 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
The Bachelor of Arts Degree in Physics 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 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.

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
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.
MATH 1500
Cryptology: The Science of Secret Writing (4 s.h.)
MATH 2100
Programming with Graphics, Symbols, and Text (2 s.h.)
MATH 2480
History of Mathematics (2 s.h.)
MATH 3120
Number Theory (2 s.h.)
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
The B.S. in Physics with Tennessee teaching licensure (Grades 6-12) is available with modifications to the Physics track 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 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 on fulfilling other categories in the Core.

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

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

Literature/History
HUMN 2171  
The Quest for a Meaningful Life ................................................................. 4 s.h.
HUMN 2172  
The Quest for a Meaningful Life ................................................................. 4 s.h.
Human Culture

If language requirement is not met by proficiency, then a student must choose FREN/SPAN/GREK 2000 to satisfy requirement.

FREN 2000, SPAN 2000, GREK 2000
Intermediate Foreign Language ................................................................. 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: Planning for Classroom Instruction .................. 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 ............................................................ 0-4 s.h.
PSYC 3320
  Adolescent Development ................................................................... 4 s.h.
EDUC 4990*
  Comprehensive Assessment (passing state-required
  Praxis II exams, successful portfolio completion,
  successful portfolio defense) .............................................................. 0 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.