

PHYSICS

Degree: Bachelor of Science
 Specializations: Computational Physics, Engineering Physics, Physics
 Minor: Physics
 Department: Physics
 Building 13, Room 301
 (850) 474-2267
 physics@uwf.edu
 College: Arts and Sciences
 Semester Hours Required for Degree: 120

Faculty: C.S. Prayaga (Chairperson), M.C. George, J.S. Marsh, R.C. Smith (Emeritus), L. Ujj.

Physics is a basic science which covers the study of matter, radiations, and interactions. The various topics covered include electricity and magnetism, electronics, fluids, mechanics, optics, quantum phenomena, and concepts of relativity, thermodynamics, waves, and several related laboratory activities.

The Physics Department offers the traditional B.S. program in Physics with additional specializations in Computational Physics and Engineering Physics. These two unique specializations are specifically designed to train students for the present-day industrial job market. UWF is one of the few schools in the southeastern U.S. which offers these two career options.

In addition to attending graduate school, a trained physicist can enter the employment market as a research scientist. Those with an engineering physics background are eligible for entry-level jobs as engineers in organizations such as the Department of Defense, NASA, and the various national labs.

Computational Physics graduates may have career opportunities in research laboratories, national labs, and graduate studies.

Students interested in obtaining certification to teach this subject area in secondary education need to contact an advisor in this department to carefully plan the course work to satisfy degree and some teacher certification requirements. A degree in this major is required for participation in teacher education certification options.

PROGRAM REQUIREMENTS

In addition to general University requirements, students seeking the B.S. in Physics must meet the requirements listed below.

Students should consult with their academic advisor for courses which may satisfy both the General Studies requirements and common prerequisites.

Course descriptions are listed alphabetically by prefix in the back of this *Catalog*.

General Studies (36 sh)

Physics majors should take CHM 2045/L and CHM 2046/L to satisfy the natural science component of General Studies.

For additional information see the General Studies section of this *Catalog*.

Common Prerequisites (28 sh)

State mandated common prerequisites must be completed prior to graduation, but are not required for admission to the program. Courses in brackets indicate substitutes from Florida public community/junior colleges and universities.

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|-------|--------|---|---|
| + CHM | 2045/L | General Chemistry I/Lab | 4 |
| | | [CHM x045/L, CHM 1045C, CHM 1045E or both CHM 1040 and CHM 1041] | |
| + CHM | 2046/L | General Chemistry II/Lab | 4 |
| | | [CHM x046/L, CHM 1046C, CHM 1046E] | |
| + MAC | 2311 | Analytic Geometry & Calculus I | 4 |
| | | [MAC x311, MAC x281] | |
| + MAC | 2312 | Analytic Geometry & Calculus II | 4 |
| | | [MAC x312, MAC x282] | |
| MAC | 2313 | Analytic Geometry & Calculus III | 4 |
| | | [MAC x313, MAC x283] | |
| + PHY | 2048/L | University Physics I/Lab | 4 |
| | | [PHY 2048C, PHY x048/L] | |
| + PHY | 2049/L | University Physics II/Lab | 4 |
| | | [PHY 2049C, PHY x049/L] | |

+ Indicates common prerequisites which can be used to satisfy General Studies requirements.

Lower Division Electives (0-9 sh)

Sufficient 1000/2000 level electives to complete at least 60 semester hours in the lower division. Current UWF students may use elective courses at any level (1000-4999) to meet this elective requirement.

Recommend a computer programming language such as COP 2253, COP 2334, or equivalent.

COMPUTATIONAL PHYSICS SPECIALIZATION

Major (33 sh)

| | | | |
|-----|-------|--|---|
| PHY | 3106 | Modern Physics I | 3 |
| PHY | 3106L | Modern Physics/Lab | 2 |
| PHY | 3107 | Modern Physics II | 3 |
| PHY | 3220 | Intermediate Mechanics | 4 |
| PHY | 4323 | Electricity & Magnetism I | 3 |
| PHY | 4325 | Electricity & Magnetism II | 3 |
| PHY | 4513 | Thermodynamics & Kinetic Theory | 3 |
| PHY | 4604 | Quantum Theory | 3 |
| PHZ | 4113 | Mathematical Physics I | 3 |
| PHZ | 4114 | Mathematical Physics II | 3 |
| | | 3000/4000 level Physics elective | 3 |

Major-Related (27 sh)

| | | | |
|-----|------|---|---|
| COP | 2253 | Programming Using Java | 3 |
| COP | 3022 | Intermediate Computer Programming | 3 |
| COT | 3100 | Applications of Discrete Structures | 3 |
| MAD | 4401 | Numerical Analysis | 3 |
| MAP | 2302 | Differential Equations | 3 |
| MAP | 4103 | Mathematical Modeling | 3 |
| MAP | 4341 | Partial Differential Equations | 3 |
| MAS | 3105 | Linear Algebra | 3 |
| | | 3000/4000 level Mathematics or Physics elective | 3 |

Upper Division Electives (0 sh)

ENGINEERING PHYSICS SPECIALIZATION**Major (36 sh)**

| | | |
|-----------|---|---|
| EGM 3512 | Engineering Mechanics | 4 |
| PHY 3106 | Modern Physics I | 3 |
| PHY 3106L | Modern Physics Lab | 2 |
| PHY 3107 | Modern Physics II | 3 |
| PHY 3424 | Optics | 3 |
| PHY 4250 | Fluid Mechanics | 3 |
| PHY 4323 | Electricity & Magnetism I | 3 |
| PHY 4325 | Electricity & Magnetism II | 3 |
| PHY 4513 | Thermodynamics & Kinetic Theory | 3 |
| PHY 4910 | Independent Research | 2 |
| PHZ 3106 | Intermediate-Level Physics Problems | 1 |
| PHZ 4113 | Mathematical Physics I | 3 |
| PHZ 4114 | Mathematical Physics II | 3 |

Major-Related (24 sh)

| | | |
|------------|--|---|
| EEL 3111 | Circuits I | 3 |
| EEL 3303L | Electric Circuits Laboratory | 1 |
| EEL 3304 | Electronic Circuits I | 3 |
| EEL 3701/L | Digital Logic & Computer Systems/Lab | 4 |
| EEL 4304L | Electronics Laboratory | 1 |
| MAD 4401 | Numerical Analysis | 3 |
| MAP 2302 | Differential Equations | 3 |
| MAS 3105 | Linear Algebra | 3 |

Choose one:

| | | |
|----------|------------------------------|---|
| COP 2253 | Programming Using Java | 3 |
| COP 2334 | Programming Using C++ | 3 |

Upper Division Electives (0 sh)**PHYSICS SPECIALIZATION****Major (43 sh)**

| | | |
|-----------|---|---|
| PHY 3106 | Modern Physics I | 3 |
| PHY 3106L | Modern Physics Lab | 2 |
| PHY 3107 | Modern Physics II | 3 |
| PHY 3220 | Intermediate Mechanics | 4 |
| PHY 3424 | Optics | 3 |
| PHY 4323 | Electricity & Magnetism I | 3 |
| PHY 4325 | Electricity & Magnetism II | 3 |
| PHY 4445 | Lasers and Applications | 3 |
| PHY 4513 | Thermodynamics & Kinetic Theory | 3 |
| PHY 4604 | Quantum Theory | 3 |
| PHY 4910 | Independent Research | 2 |
| PHZ 3106 | Intermediate-Level Physics Problems | 1 |
| PHZ 4113 | Mathematical Physics I | 3 |
| PHZ 4114 | Mathematical Physics II | 3 |
| 3000/4000 | Physics (PHY, PHZ) elective | 4 |

Major-Related (17 sh)

| | | |
|-----------|--|---|
| EEL 3111 | Circuits I | 3 |
| EEL 3303L | Electric Circuits Laboratory | 1 |
| MAD 4401 | Numerical Analysis | 3 |
| MAP 2302 | Differential Equations | 3 |
| MAS 3105 | Linear Algebra | 3 |
| 3000/4000 | level Physics or Mathematics elective as approved by advisor | 4 |

Upper Division Electives (0 sh)**MINOR**

A Minor in Physics can be earned by completing 15 sh of physics courses above 3100 level, including PHY 3106, PHY 3107, and PHY 4323. Physics majors may not earn this minor.