

PHYSICS

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

Faculty: C.S. Prayaga (Chairperson), 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.

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.

| | | |
|-------------|--|---|
| +CHM 2045/L | General Chemistry I/Lab..... | 4 |
| | [CHM X045/L, CHM X045C, CHM X045E or both CHM X040 and CHM X041] | |
| +CHM 2046/L | General Chemistry II/Lab..... | 4 |
| | [CHM X046/L, CHM X046C, CHM X046E] | |
| +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 X048C, PHY X048/L] | |
| +PHY 2049/L | University Physics II/Lab..... | 4 |
| | [PHY X049C, 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)

Physics Core (23 sh)

| | | |
|-----------|--------------------------------------|---|
| PHY 3106 | Modern Physics I..... | 3 |
| PHY 3106L | Modern Physics Lab..... | 2 |
| PHY 3107 | Modern Physics II..... | 3 |
| PHY 4323 | Electricity & Magnetism I..... | 3 |
| PHY 4325 | Electricity & Magnetism II..... | 3 |
| PHY 4513 | Thermodynamics & Kinetic Theory..... | 3 |
| PHZ 4113 | Mathematical Physics I..... | 3 |
| PHZ 4114 | Mathematical Physics II..... | 3 |

Computational Physics Specialization (10 sh)

| | | |
|-----------------|-----------------------------|---|
| PHY 3220 | Intermediate Mechanics..... | 4 |
| PHY 4604 | Quantum Theory..... | 3 |
| 3000/4000 level | Physics elective..... | 3 |

Major-Related (27 sh)

| | | |
|-----------------|--------------------------------------|---|
| COP 3411/L | Data Structures I..... | 4 |
| COT 3011/L | Algorithms and Program Design..... | 4 |
| 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..... | 4 |

Upper Division Electives (0 sh)

ENGINEERING PHYSICS SPECIALIZATION

Major (36 sh)

Physics Core (23 sh)

Same as Computational Physics

Engineering Physics Specialization (13 sh)

| | | | |
|-----|------|---|---|
| EGM | 3512 | Engineering Mechanics | 4 |
| PHY | 3424 | Optics | 3 |
| PHY | 4250 | Fluid Mechanics | 3 |
| PHY | 4910 | Independent Research | 2 |
| PHZ | 3106 | Intermediate-Level Physics Problems | 1 |

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)

Physics Core (23 sh)

Same as Computational Physics

Physics Specialization (20 sh)

| | | | |
|---|------|---|---|
| PHY | 3220 | Intermediate Mechanics | 4 |
| PHY | 3424 | Optics | 3 |
| PHY | 4445 | Lasers and Applications | 3 |
| PHY | 4604 | Quantum Theory | 3 |
| PHY | 4910 | Independent Research | 2 |
| PHZ | 3106 | Intermediate-Level Physics Problems | 1 |
| 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.