

B.S. in Applied Physics

Bachelor of Science in Applied Physics - Astronomy Option

First Year

| 1st Semester | | Term Credits |
|-------------------------|---|--------------|
| HUM 101 | English Composition: Writing, Speaking, Thinking I | 3 |
| PHYS 111 | Physics I | 3 |
| PHYS 111A | Physics I Laboratory | 1 |
| MATH 111 | Calculus I | 4 |
| CS 113 or CS 115 | Introduction to Computer Science or Intro. to CS I in C++ | 3 |
| CHEM 121 or CHEM 125 | Fundamentals of Chemical Principles I or General Chemistry I | 3 |
| FRSH SEM | Freshman Seminar | 0 |
| Term Credits | | 17 |

2nd Semester

| | | |
|---------------------------------|---|-----------|
| PHYS 114 | Introduction to Data Reduction with Applications | 3 |
| PHYS 121 | Physics II | 3 |
| PHYS 121A | Physics II Laboratory | 1 |
| MATH 112 | Calculus II | 4 |
| CHEM 122 or CHEM 126 | Fundamentals of Chemical Principles II or General Chemistry II | 3 |
| CHEM 124 | General Chemistry Laboratory | 1 |
| Physical Education:GUR Elective | | 1 |
| Term Credits | | 16 |

Second Year

1st Semester

| | | |
|---|---|-----------|
| MATH 211 | Calculus III A | 3 |
| MATH 225 | Survey of Probability and Statistics | 1 |
| PHYS 234 | Physics III | 3 |
| PHYS 231A | Physics III Laboratory | 1 |
| Social Science (lower-level):GUR Elective | | 3 |
| HUM 102 | English Composition: Writing, Speaking, Thinking II | 3 |
| Physical Education:GUR Elective | | 1 |
| Term Credits | | 15 |

2nd Semester

| | | |
|---|---|-----------|
| MATH 222 | Differential Equations | 4 |
| MATH 328 | Mathematical Methods for Scientists and Engineers | 3 |
| PHYS 335 | Introductory Thermodynamics | 3 |
| Social Science (lower-level):GUR Elective | | 3 |
| English Composition and Cultural History (lower-level):GUR Elective | | 3 |
| Term Credits | | 16 |

Third Year

1st Semester

| | | |
|---|---------------------------------|-----------|
| PHYS 418 | Fundamentals of Optical Imaging | 3 |
| PHYS 432 | Electromagnetism I | 3 |
| PHYS 320 | Astronomy and Astrophysics I | 3 |
| Humanities and Social Sciences (upper-level):GUR Elective | | 3 |
| PHYS 430 | Classical Mechanics I | 3 |
| Term Credits | | 15 |

2nd Semester

| | | |
|---|-----------------------------------|------------|
| PHYS 433 | Electromagnetism II | 3 |
| PHYS 321 | Astronomy and Astrophysics II | 3 |
| Math Elective | | 3 |
| Capstone Seminar:GUR Elective | | 3 |
| Humanities and Social Sciences (upper-level):GUR Elective | | 3 |
| Math/Phys/CS Elective | | 3 |
| Term Credits | | 18 |
| Fourth Year | | |
| 1st Semester | | |
| PHYS 420 | Special Relativity | 3 |
| PHYS 442 | Introduction to Quantum Mechanics | 3 |
| Math/Phys/CS Elective | | 3 |
| Technical Elective | | 3 |
| Management:GUR Elective | | 3 |
| Term Credits | | 15 |
| 2nd Semester | | |
| PHYS 322 | Observational Astronomy | 3 |
| PHYS 421 | General Relativity | 3 |
| PHYS 450 | Advanced Physics Laboratory | 3 |
| Technical Elective | | 3 |
| Technical Elective | | 3 |
| Term Credits | | 15 |
| Total Credits | | 127 |

Electives

Math/Phys/CS

Consult the physics department for information about qualifying courses.

Technical

Consult the physics department for information about qualifying courses.

Refer to the **General University Requirements** for further information on GUR electives.

Co-op Courses

Co-op courses bearing degree credit replace a technical elective or another course approved by the faculty advisor in the students major department. In applied physics, both PHYS 311 Co-op Work Experience I and PHYS 411 Co-op Work Experience II are taken for degree Credit with permission.

Bachelor of Science in Applied Physics - Optical Science and Engineering Option

First Year

| 1st Semester | | Term Credits |
|---------------------|--|---------------------|
| HUM 101 | English Composition: Writing, Speaking, Thinking I | 3 |
| PHYS 111 | Physics I | 3 |
| PHYS 111A | Physics I Laboratory | 1 |
| MATH 111 | Calculus I | 4 |
| CS 113 or CS 115 | Introduction to Computer Science or Intro. to CS I in C++ | 3 |
| CHEM 125 | General Chemistry I | 3 |
| FRSH SEM | Freshman Seminar | 0 |
| Term Credits | | 17 |

2nd Semester

| | | |
|-----------|--|---|
| PHYS 114 | Introduction to Data Reduction with Applications | 3 |
| PHYS 121 | Physics II | 3 |
| PHYS 121A | Physics II Laboratory | 1 |

| | | |
|---|---|-----------|
| MATH 112 | Calculus II | 4 |
| CHEM 126 | General Chemistry II | 3 |
| CHEM 124 | General Chemistry Laboratory | 1 |
| Physical Education:GUR Elective | | 1 |
| Term Credits | | 16 |
| Second Year | | |
| 1st Semester | | |
| MATH 211 | Calculus III A | 3 |
| MATH 225 | Survey of Probability and Statistics | 1 |
| PHYS 234 | Physics III | 3 |
| PHYS 231A | Physics III Laboratory | 1 |
| Social Science (lower-level):GUR Elective | | 3 |
| English Composition and Cultural History (lower-level):GUR Elective | | 3 |
| Physical Education:GUR Elective | | 1 |
| Term Credits | | 15 |
| 2nd Semester | | |
| MATH 222 | Differential Equations | 4 |
| MATH 328 | Mathematical Methods for Scientists and Engineers | 3 |
| MATH 335 | Vector Analysis | 3 |
| Social Sciences (lower-level):GUR Elective | | 3 |
| English Composition and Cultural History (lower-level):GUR Elective | | 3 |
| Term Credits | | 16 |
| Third Year | | |
| 1st Semester | | |
| OPSE 301 | Introduction to Optical Science and Engineering | 3 |
| PHYS 418 | Fundamentals of Optical Imaging | 3 |
| PHYS 430 | Classical Mechanics I | 3 |
| PHYS 432 | Electromagnetism I | 3 |
| Humanities and Social Sciences (upper-level):GUR Elective | | 3 |
| Term Credits | | 15 |
| 2nd Semester | | |
| PHYS 433 | Electromagnetism II | 3 |
| PHYS 446 | Solid State Physics | 3 |
| OPSE 402 | High Power Laser and Photonics Applications | 3 |
| Free Elective | | 3 |
| Humanities and Social Sciences (upper-level):GUR Elective | | 3 |
| Phys/OPSE Elective | | 3 |
| Term Credits | | 18 |
| Fourth Year | | |
| 1st Semester | | |
| PHYS 442 | Introduction to Quantum Mechanics | 3 |
| Technical Elective | | 3 |
| Management Elective | | 3 |
| Technical Elective | | 3 |
| Phys/OPSE/EE Elective | | 3 |
| Term Credits | | 15 |
| 2nd Semester | | |
| OPSE 310 | Virtual Instrumentation | 3 |
| PHYS 450 | Advanced Physics Laboratory | 3 |
| Phys/EE Elective | | 3 |
| Technical Elective | | 3 |

| | |
|---------------------------|------------|
| Capstone Seminar Elective | 3 |
| Term Credits | 15 |
| Total Credits | 127 |

Electives

Phys/OPSE

Consult the physics department for information about qualifying courses.

Math/Phys/CS

Consult the physics department for information about qualifying courses.

Math/Phys/EE/CS

Consult the physics department for information about qualifying courses.

Technical

Consult the physics department for information about qualifying courses.

Refer to the **General University Requirements** for further information on GUR electives.

Co-op Courses

Co-op courses bearing degree credit replace a technical elective or another course approved by the faculty advisor in the students major department. In applied physics, both PHYS 311 Co-op Work Experience I and PHYS 411 Co-op Work Experience II are taken for degree Credit with permission.

This curriculum represents the maximum number of credits per semester for which a student is advised to register. A full-time credit load is 12 credits.

First-year students are placed in a curriculum that positions them for success which may result in additional time needed to complete curriculum requirements. Continuing students should consult with their academic advisor to determine the appropriate credit load.