# Sample Curriculum

# Sequence for students that can begin with Calculus (for abbreviations see below):

|  |  |  |  |
| --- | --- | --- | --- |
| **Year**  Freshman | **Fall**  PHYS 1901 – Seminar | **SH**  1 | **Spring SH**  PHYS 2051 – Intro Physics 1 5 |
|  | MATH 2301 – Calculus 1 | 4 | MATH 2302 – Calculus 2 4 |
|  | T1-FC | 3 | T2-HL 3 |
|  | T2-CC | 3 | T2-SS 3 |
|  | T2-FA | 3 |  |
| Total |  | 14 | 15 |
| Sophomore | PHYS 2052 – Intro Physics 2 | 5 | PHYS 2053 – Contemp. Physics 3 |
|  |  |  | PHYS 2701 – Electronics 2 |
|  | MATH 3300 – Calculus 3 | 4 | MATH 3400 – ODEs 3 |
|  | FL | 4 | FL 4 |
|  | A&S-H | 3 | A&S-SS 3 |
| Total |  | 16 | 15 |
| Junior | PHYS 3001 – Class Mech | 4 | PHYS 3011 – Thermal Physics 3 |
|  | PHYS 3701 – Junior Lab 1 | 2 | PHYS 3702 – Junior Lab 2 2 |
|  | MATH 3200 – Linear Algebra | 3 | MATH 4410 – PDEs & Fourier Anal. 3 |
|  | MATH 3600 – Numerical Meth | 3 | T1-JC 3 |
|  | A&S-H | 3 | A&S-SS 3 |
|  |  |  | Elective 1-3 |
| Total |  | 15 | 15-17 |
| Senior | PHYS 4031 – E&M 1 | 3 | PHYS 4032 – E&M 2 3 |
|  | PHYS 4021 – Quantum Mech. | 3 | PHYS 4051\* – Modern Physics (T3E) 3 |
|  | Elective | 3 | Elective 3 |
|  | Elective | 3 | Elective 3 |
|  | Elective | 3 | Elective 3 |
| Total |  | 15 | 15 |

For the Tier I, Tier II and Arts &Sciences distribution requirements, the order of taking the different areas is flexible. One just has to ensure that each of the areas is checked at some point.

**\***PHYS 4051 is a Tier III-equivalent course that combines parts of the former optional quarter courses PHYS 471 (Solid State Physics) and PHYS 453 (Nuclear & Particle Physics) plus additional material from other areas of physics. This is not required course, but Physics majors are encouraged to take it during their senior year following Quantum Mechanics (PHYS 4021) as their Tier III requirement.

Course description for Physics, Astronomy and Math courses are given in the Appendices.

# Abbreviations:

|  |  |  |  |
| --- | --- | --- | --- |
| University Requirements | Abbreviation | College Requirements | Abbreviation |
| Tier I – Freshmen Composition | T1-FC | A&S 200-level or higher | # |
| Tier I – Quantitative Skills | T1-QS | A&S Humanities | A&S- H |
| Tier I – Junior Composition | T1-JC | A&S Social Sciences | A&S- SS |
| Tier II- Applied Science & Math | T2-AS | A&S Natural Sciences | A&S - NS |
| Tier II – Cross-Cultural Perspectives | T2-CP | Foreign Language | FL |
| Tier II – Fine Arts | T2-FA | Elective | E |
| Tier II – Humanities & Literature | T2-HL |  |  |
| Tier II – Natural Sciences | T2-NS |  |  |
| Tier II – Social Sciences | T2-SS |  |  |
| Tier III | T3 or T3E |  |  |

**Sequence for students requiring Pre-calculus (for abbreviations see previous page)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Freshman | PHYS 1901 – Seminar | 1 | PHYS 2051 – Intro Physics 1 | 5 |
|  | MATH 1300 – Pre-calculus | 4 | MATH 2301 – Calculus 1 | 4 |
|  | T1-FC | 3 | T2-HL | 3 |
|  | T2-CC | 3 | T2-SS | 3 |
|  | T2-FA | 3 |  |  |
| Total |  | 14 |  | 15 |
| Sophomore | PHYS 2052 – Intro Physics 2 | 5 | PHYS 2053 – Contemp. Physics | 3 |
|  |  |  | PHYS 2701 – Electronics | 2 |
|  | MATH 2302 Calculus 2 | 4 | MATH 3300 – Calculus 3 | 4 |
|  | A&S-H | 3 | MATH 3400 – ODEs | 3 |
|  | FL | 4 | FL | 4 |
| Total |  | 16 |  | 16 |
| Junior | PHYS 3001 – Class. Mechanics | 4 | PHYS 3011 – Thermal Physics | 3 |
|  | PHYS 3701 – Junior Lab 1 | 2 | PHYS 3702 – Junior Lab 2 | 2 |
|  | MATH 3200 – Linear Algebra | 3 | MATH 4410 – PDEs & Fourier Anal. | 3 |
|  | MATH 3600 – Numerical Meth | 3 | T1-JC | 3 |
|  | A&S-SS | 3 | A&S-SS | 3 |
|  |  |  | A&S-H | 3 |
| Total |  | 15 |  | 17 |
| Senior | PHYS 4031 – E&M 1 | 3 | PHYS 4032 – E&M 2 | 3 |
|  | PHYS 4021 – Quantum Mech. | 3 | PHYS 4051\* – Modern Physics (T3E) | 3 |
|  | Elective | 3 | Elective | 3 |
|  | Elective | 3 | Elective | 3 |
|  | Elective | 3 | Elective | 3 |
| Total |  | 15 |  | 15 |

For the Tier I, Tier II and Arts &Sciences distribution requirements, the order of taking the different areas is flexible. One just has to ensure that each of the areas is checked at some point.

**\***PHYS 4051 is a Tier III-equivalent course that combines parts of the optional courses PHYS 471 (Solid State Physics) and PHYS 453 (Nuclear & Particle Physics) plus additional material from other areas of physics. This is not required course, but Physics majors are encouraged to take it during their senior year following Quantum Mechanics (PHYS 4021) as their Tier III requirement.

Full course description for all Physics, Astronomy and Math courses are given in the Appendices.

# Quarters to Semester course conversion rules:

PHYS 2051 + 2052 = PHYS 251 + 252 + 253 PHYS 2053 = PHYS 254

PHYS 3001 = PHYS 311 + 312 PHYS 3011 = PHYS 411

PHYS 3701 + 3702 = PHYS 371 + 372 + 373 PHYS 2701 = PHYS 272 + 273

PHYS 4031 + 4032 = PHYS 427 + 428 + 429 (part)

ASTR 3251 = ASTR 305 ASTR 4271 = ASTR 410

ASTR 4201 = ASTR 401 + ASTR 402 ASTR 4202 = ASTR 402 + ASTR 403

MATH 2301 + 2302 = MATH 263A + B + C MATH 3300 = MATH 263D MATH 3400 = MATH 340 MATH 3200 = MATH 410

MATH 4410 = MATH 441

# Summary of required courses for the Physics Major:

**PHYS** 1901, 2051, 2052, 2053, 2701, 3001, 3011, 3701, 3702, 4021, 4031, 4032

**MATH** 2301, 2302, 3200, 3300, 3400, 3600, 4410

**Electives:** complete at least 6 hours in PHYS, ASTR or MATH at 3000-level or above, in CHEM at 1500-level or above, or in BIOS at 1700-level or above. Courses used in the major may not be reused here.

# For a Bachelor of Science degree under Semesters, students must also complete:

* a minimum 120 semester hours (SH).
* Gen. Ed. Tier I: Freshman English (3 SH) and Junior English (3 SH); the Tier I quantitative requirement are fulfilled for us automatically by calculus.
* Gen. Ed. Tier II: 21 SH with at least 2 credit hours from each of the six current areas:
  + Applied Science & Math (2AS)
  + Cross-cultural Perspectives (2CP)
  + Fine Arts (2FA)
  + Humanities and Literature (2HL)
  + Natural Sciences (2NS)
  + Social Sciences (2SS)].

No more than 8 SH may be taken in the same Department/School and no more than two areas can be satisfied by the same Department/School. No more than two courses can come from the students' major department.

* Language Requirement: For a B.S. one year of college foreign language is required. Students must pass 1120 or higher (test-outs will be available). For a B.A. this is 2 years
* A&S Distribution Requirements: 27 SH total including a minimum of 9 hours in each domain (Humanities, Social Sciences, and Natural Sciences). For a B.A. this is 33 hours total.
  + Our students never have a problem with the Natural Science requirement, but they will need ~3 courses each from courses listed on a student’s DARS for A&S Humanities and A&S Social Sciences. It is possible to get some of the

Tier II courses to count towards these numbers.

* 60 SH of Arts & Sciences coursework at 200-level and above.
* No more than 12 SH taken with the grade of CR.