Bachelor of Science in Physics: Astrophysics Concentration

FIRST YEAR

Fall
Social and Behavioral Sciences* 3
MATH 1451, Calculus I 4
ENGL 1301, Essentials of Coll. Rhetoric 3
Personl Fitness and Wellness 1
COMS 2300, Public Speaking 3
TOTAL 14

Spring
PHYS 1408, Principles of Physics I 4
MATH 1452, Calculus II 4
ENGL 1302, Advanced College Rhetoric 3
Personal Fitness and Wellness 1
COMS 2300, Public Speaking 3
TOTAL 15

SECOND YEAR

Fall
PHYS 2401, Principles of Physics II 4
MATH 2450, Calculus III 4
POLIS 1301, American Govt. Org. 3
Language, Philosophy, and Culture* 3
Foreign Language ‡ 3
ASTR 1401, Stellar Astronomy 4
TOTAL 17

Spring
PHYS 2402, Principles of Physics III 4
MATH 3350, Math for Engr. & Sci. I 3
POLIS 2302, American Public Policy 3
Foreign Language ‡ 3
ASTR 4301, Astrophysics I 3
TOTAL 16

THIRD YEAR

Fall
PHYS 3305, Electricity and Magnetism 3
PHYS 3304, Intermediate Physics Lab 3
HIST 2300, History of the U.S. to 1877 3
TOTAL 12

Spring
PHYS 4307, Quantum Mechanics I 3
PHYS 4304, Mechanics 3
HIST 2301, History of the U.S. since 1877 3
2000-Level ENGL 3
TOTAL 15

FOURTH YEAR

Fall
PHYS 4307, Quantum Mechanics II 3
PHYS 3403, Intermediate Physics Lab 3
PHYS 4312, Nuclear & Particle Physics 3
2000-Level ENGL 3
TOTAL 12

Spring
PHYS 4304, Mechanics 3
PHYS 4307, Quantum Mechanics I 3
PHYS Elective 3
PHYS Elective 4
TOTAL 16

TOTAL HOURS: 120

Astrophysics concentration students are strongly encouraged to minor in mathematics, as assumed in the curriculum above.

* Choose from the university's core curriculum.
† A student must complete 6 hours at the sophomore level or above in a single language. The prerequisite for all sophomore language courses is credit for the freshman level. This credit can be determined through a credit by examination. The score attained on the exam will determine whether the student is placed in a second-year course, a 5-hour review course, or in some cases the first or second semester of a beginning (first-year) language course. See Arts and Sciences General Degree Requirements for further explanation.
‡ MATH 3554 and 4354 may substitute for MATH 3350 and 3351.
§ May be substituted with MATH 3354 and MATH 4354.
# Choose from the university’s Multicultural Requirement list.

Graduate Courses

5000. Independent Study (V1-3). Prerequisite: Permission of the department chair. Offers independent study under the direct supervision of a faculty member. Not to be used for thesis or dissertation research or writing.

5001. Master's Internship (V1-12). Prerequisite: Permission of the internship coordinator. Internship in an industrial or research laboratory setting. Arranged through the department and directly related to degree program.

5101. Seminar (1). Must be taken by every graduate student for at least the first four semesters. Taken pass/fail.

5104. Instructional Laboratory Techniques in Physics (1). Laboratory organization and instructional techniques. Must be taken by all teaching assistants when on appointment.


5300. Special Topics (3). Prerequisite: Approval of graduate advisor and/or department chair. Topics in semiconductor, plasma, surface, particle physics, spectroscopy, and others. May be repeated in different areas.

5301. Quantum Mechanics I (3). Experimental basis and history, wave equation, Schrödinger equation, harmonic oscillator, piecewise constant potentials, WKB approximation, central forces and angular momentum, hydrogen atom, spin, two-level systems, and scattering. M.S. and Ph.D. core course.

5302. Quantum Mechanics II (3). Prerequisite: PHYS 5301 or equivalent. Quantum dynamics, rotations, bound-state and time-dependent perturbation theory; identical particles, atomic and molecular structure, electromagnetic interactions, and formal scattering theory. Ph.D. core course.

5303. Electromagnetic Theory (3). Electrostatics and magnetostatics, time varying fields, Maxwell’s equations and conservation laws, electromagnetic waves in materials and in waveguides. M.S. and Ph.D. core course.