Twin Cities Campus

Astrophysics B.A.

Astrophysics, Minnesota Institute for

College of Liberal Arts

- Program Type: Baccalaureate
- Requirements for this program are current for Spring 2018
- Required credits to graduate with this degree: 120
- Required credits within the major: 73 to 75
- Degree: Bachelor of Arts

The program in astrophysics develops the skills necessary to tackle complex and ill-defined problems within the physical sciences and prepares students for careers in several broad areas. The program is aimed primarily for students interested in secondary education in the physical sciences, science policy, and science and technical writing. The program can also prepare students for graduate study in astrophysics.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

Students must complete 7 courses before admission to the program.

For information about University of Minnesota admission requirements, visit the Office of Admissions website.

Required prerequisites

Math Requirements

Take 3 courses for a total of 12 credits.

Calculus I

MATH 1271 - Calculus I [MATH] (4.0 cr)
or MATH 1371 - CSE Calculus I [MATH] (4.0 cr)
or MATH 1571H - Honors Calculus I [MATH] (4.0 cr)

Calculus II

MATH 1272 - Calculus II (4.0 cr)
or MATH 1372 - CSE Calculus II (4.0 cr)
or MATH 1572H - Honors Calculus II (4.0 cr)

Linear Algebra

MATH 2243 - Linear Algebra and Differential Equations (4.0 cr)
or MATH 2373 - CSE Linear Algebra and Differential Equations (4.0 cr)
or MATH 2574H - Honors Calculus IV (4.0 cr)

Physics Requirements

Take 4 courses for a total of 16 credits.

Physics I

PHYS 1301W - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)
or PHYS 1401V - Honors Physics I [PHYS, WI] (4.0 cr)
or PHYS 1501V *{Inactive}*[PHYS, WI] (4.0 cr)

Physics II

PHYS 1302W - Introductory Physics for Science and Engineering II [PHYS, WI] (4.0 cr)
or PHYS 1402V - Honors Physics II [PHYS, WI] (4.0 cr)
or PHYS 1502V *{Inactive}*[PHYS, WI] (4.0 cr)

Thermodynamics

PHYS 2201 - Introductory Thermodynamics and Statistical Physics (4.0 cr)

Physics III

PHYS 2503 - Physics III: Intro to Waves, Optics, and Special Relativity (4.0 cr)
or PHYS 2503H - Honors Physics III (4.0 cr)

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the liberal education requirements.Required courses for the major or minor in

which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

Students are required to take 4 semester(s) of any second language.

CLA BA degrees require 18 upper-division (3xxx-level or higher) credits outside the major designator. These credits must be taken in designators different from the major designator and cannot include courses that are cross-listed with the major designator. The major designator for the Astrophysics BA is AST.

AST 1011H is recommended but not required. The number of credits in the major varies by area of interest, but requires at least 15 credits of AST courses.

Students may earn no more than one undergraduate degree from the Astrophysics program: a BA or a BS or a minor.

All incoming CLA freshmen must complete the First Year Experience course sequence.

Multivariable Calculus

Take 1 course for 4 credits.
MATH 2263 - Multivariable Calculus (4.0 cr)
or MATH 2374 - CSE Multivariable Calculus and Vector Analysis (4.0 cr)
or MATH 2573H - Honors Calculus III (4.0 cr)

Major Courses

Each of the different areas of interest has the same core math, physics, and astrophysics requirements. Curriculum details for the different areas--secondary education, science writing, science policy, and scientist--are developed by the student in consultation with an adviser.

Astrophysics Requirement

Take 3 courses for a total of 12 credits.
AST 2001 - Fundamental Astrophysics (4.0 cr)
AST 4001 - Astrophysics I (4.0 cr)
AST 4002 - Astrophysics II (4.0 cr)

Physics Requirement

Take 5 courses for a total of 18 credits.
PHYS 2601 - Quantum Physics (4.0 cr)
PHYS 3041 - Mathematical Methods for Physicists (3.0 cr)
PHYS 3605W - Modern Physics Laboratory [WI] (3.0 cr)
PHYS 4001 - Analytical Mechanics (4.0 cr)
PHYS 4002 - Electricity and Magnetism (4.0 cr)

Technical Electives

Technical electives outside of AST/PHYS may be approved by departmental adviser.
Take 8 or more credit(s) from the following:
- AST 4xxx
- AST 5xxx
- PHYS 4303 - Electrodynamics and Waves (3.0 cr)

Senior Project

This requirement can be met with directed research in astrophysics or a project tailored to the specific area of interest.
AST 4994W - Directed Research [WI] (2.0 - 5.0 cr)

Upper Division Writing Intensive within the major

Students are required to take one upper division writing intensive course within the major. If that requirement has not been satisfied within the core major requirements, students must choose one course from the following list. Some of these courses may also fulfill other major requirements.
Take 0 - 1 course(s) from the following:
- AST 4994W - Directed Research [WI] (2.0 - 5.0 cr)
- PHYS 3605W - Modern Physics Laboratory [WI] (3.0 cr)