

PROGRAM OVERVIEW

From medical advances to space exploration, physicists find their home across the whole range of science and technology. The most basic of the sciences, physics is all around us every day. The physics major is one of the few academic degree programs that prepares its graduates for an amazing array of careers. Physicists are renowned for their logical thought, analytical minds, problem solving skills and mathematical ability.

The physics major can be completed via one of two tracks. The Pure & Applied Physics is a traditional physics major. With a suitable choice of electives, this track prepares students for graduate studies in physics, engineering or similar fields, and for technical jobs in many areas of industry including optics, electronics, communications, robotics, control systems, spacecraft systems and computer modeling. Students assist our faculty in their research in fields as diverse as low temperature physics, astrophysics and particle physics.

ACADEMIC ADVISING

The College of Liberal Arts and Sciences (CLAS) supports students to graduation using a shared advising system. CLAS students have two academic advisors with whom they should meet regularly to discuss academic and degree progress: a CLAS Academic Advisor and a major/faculty advisor.

For questions related to CU Denver Core Curriculum, CLAS, general graduation requirements, university/college academic policies, or campus resources contact:

CLAS Academic Advising

clas_advising@ucdenver.edu

Find your CLAS Advisor [here](#)

North Classroom (NC) Building 1030

303-315-7100

For questions related to major requirements, major course prerequisites, or evaluation of transfer coursework in your major contact:

Michael "Bodhi" Rogers

michael.b.rogers@ucdenver.edu

Visit the department website [here](#)

North Classroom (NC) 3123B

303-315-7392

GENERAL GRADUATION REQUIREMENTS & POLICIES

All CU Denver CLAS students are required to complete the following minimum general graduation requirements to be eligible to apply for graduation:

1. Complete a minimum of 120 semester hours
2. Achieve a minimum 2.0 CU cumulative grade point average (GPA)
3. Complete a minimum of 45 upper-division (3000- to 4000-level) semester hours
4. Complete all CU Denver Core, CLAS, and major requirements
5. Complete a minimum of 30 CLAS hours at CU Denver

*The following are **maximum** semester hours that can apply toward the minimum 120 hours required for graduation:*

- 56 semester hours in major department/prefix courses
- 16 semester hours Pass/Fail
- 12 semester hours of Independent Study/Directed Research
- 12 semester hours of internship credit
- 8 semester hours of physical education credit

PROGRAM REQUIREMENTS & POLICIES

Students are responsible for meeting with the major/faculty advisor in the department to confirm major requirements. In addition to completing all CU Denver Core and CLAS requirements, students completing the Physics Pure and Applied B.S. Degree are required to complete the following minimum program requirements:

1. Students must complete a total of 63 credits, including a minimum of 47 PHYS credit hours and 16 credit hours in ancillary (supporting math) coursework.
2. Students must complete a minimum of 16 upper-division (3000-level and above) credit hours in the major.
3. Students must earn a minimum grade of C-(1.7) in all major courses taken at CU Denver and must achieve a minimum cumulative major GPA of 2.0. All graded attempts in required and elective courses are calculated in the major GPA. Students cannot complete major or ancillary course requirements as pass/fail.
4. Students must complete a minimum of 12 PHYS credit hours with CU Denver faculty.
5. Students must declare their intention to major in Physics by the time they have completed 60 semester hours
6. The introductory labs, PHYS 2351 and PHYS 2361, are required for all physics majors. If the department is unable to offer one or both of these labs then PHYS 2321 may be substituted for PHYS 2351 and PHYS 2341 may be substituted for PHYS 2361, upon prior advisor approval.
7. Students earning a Physics major cannot earn a Physics minor. A senior thesis is required for all students wishing to graduate with departmental honors. For all other students, the faculty encourages a senior thesis or project.

LYNX CONNECT RESOURCES

Are you interested in learning about internship, study abroad, career, and research opportunities for this major? Visit the CU Denver Lynx Connect, located in Tivoli Student Union (TV) Suite 339, and browse the Lynx Connect [website](#) for more information.

Degree Requirements	Credits	Notes
* Course prerequisites change regularly. Students are responsible for consulting advisors and the class schedule in the student portal for prerequisite information. *		
CU Denver Core Curriculum Requirements	34 - 40	CU Denver Core Curriculum Requirements
CLAS Graduation Requirements	15 - 29	CLAS Graduation Requirements
PHYS Major Requirements	63	16 semester hours must be upper-division
PHYS Required Courses		
PHYS 2311 General Physics I: Calculus-Based	4	*Prerequisite: C- or higher in MATH 1401
PHYS 2351 Applied Physics Lab I	1	*Corequisite: PHYS 2311 *PHYS 2321 General Physics Laboratory I may be substituted only with advisor approval
PHYS 2331 General Physics II: Calculus-Based	4	*Prerequisite: C- or higher in PHYS 2311 and MATH 2411
PHYS 2361: Applied Physics Lab II	1	*Prerequisite: PHYS 2351 *Corequisite: PHYS 2331 *PHYS 2341 General Physics Laboratory II may be substituted only with advisor approval
PHYS 2711 Vibrations and Waves	3	*Prerequisite: C- or higher in PHYS 2331 and MATH 2411
PHYS 2811 Modern Physics I	4	*Prerequisite: C- or higher in PHYS 2331 and MATH 2411
PHYS 3120 Methods of Mathematical Physics	3	*Prerequisite: C- or higher in MATH 2421 and either MATH 3195 or MATH 3191 and 3200
PHYS 3711 Junior Lab I	2	*Prerequisite: C- or higher in PHYS 2811
PHYS 3811 Quantum Mechanics	4	*Prerequisite: C- or higher in PHYS 2811 and PHYS 3211
Required Pure & Applied Courses		
PHYS 3211 Analytical Mechanics	4	*Prerequisite: C- or higher in PHYS 2711, MATH 2421, and either MATH 3195 or MATH 3191 and 3200 *Corequisite: PHYS 3120
PHYS 3411 Thermal Physics	3	*Prerequisite: C- or higher in PHYS 2331, PHYS 2811, and MATH 2421 *Corequisite: MATH 3195
PHYS 3721 Junior Lab II	2	*Prerequisite: C- or higher in PHYS 3711
PHYS 4711 Senior Lab I or a computational physics course approved by advisor	2	*Prerequisite: C- or higher in PHYS 3721 *See department for approved computational physics course options.
PHYS 4331 Principles of Electricity and Magnetism	4	*Prerequisite: C- or higher in PHYS 2331 and PHYS 3120 Note: PHYS 4351 with a C or higher may also fulfill this requirement
PHYS electives at 3000-level or above	6	*See department for approved courses. Check individual courses for prerequisites.
Required Ancillary Courses		
MATH 1401 Calculus I	4	*Prerequisite: C- or higher in MATH 1109, 1070, or 1110 and MATH 1120; or C- or higher in MATH 1130; or C- or higher in MATH 1401; or entry into the MA01 Student Group OR ALEKS PPL score 76-100. Course can fulfill CU Denver Core Mathematics
MATH 2411 Calculus II	4	*Prerequisite: C- or better in MATH 1401 Course can fulfill CU Denver Core Mathematics
MATH 2421 Calculus III	4	*Prerequisite: C- or better in MATH 2411 Course can fulfill CU Denver Core Mathematics
MATH 3195 Linear Algebra and Differential Equations or both MATH 3191 Applied Linear Algebra and MATH 3200 Elementary Differential Equations	4 - 6	*Prerequisite: C- or higher in MATH 2411 (B- recommended) *Corequisite: MATH 3191 (for 3200)
Estimated General Electives	0 - 8	General Elective credits will vary based on Core & CLAS Requirements. Consult with CLAS Advisor.
Total Minimum Program Hours:	120	45 semester hours must be upper-division

SAMPLE ACADEMIC PLAN OF STUDY

The following academic plan is a *sample* pathway to completing degree requirements for this major. Students should tailor this plan based on previously completed college coursework (e.g., AP, IB, CLEP, dual/concurrent enrollment, and transfer credit), course availability, and individual preferences related to course load, schedules, or add-on programs such as minors or double-majors.

Year One	Fall	CRS
	ENGL 1020 – Core Composition I	3
	CU Denver Core Behavioral Science	3
	MATH 1401 ^{PE C}	4
	CU Denver Core Humanities / First-Year Seminar	3
	CU Denver Core Social Science	3
Total Credit Hours	16	

Spring	CRS
ENGL 2030 – Core Composition II	3
CU Denver Core Arts	3
MATH 2411 ^{PE C}	4
PHYS 2311 ^{PE C} and PHYS 2351 ^{PE}	5
Total Credit Hours	15

Year Two	Fall	CRS
	MATH 2421 ^{PE C}	4
	PHYS 2331 ^{PE C} and PHYS 2361 ^{PE}	5
	CLAS Communicative Skills	3
	CLAS Humanities	3
Total Credit Hours	15	

Spring	CRS
PHYS 2711 ^{PE}	3
PHYS 2811 ^{PE}	4
CLAS Behavioral Science	3
MATH 3195 ^{PE}	4
Total Credit Hours	14

† Availability of upper-division PHYS courses varies significantly by semester. Meet with the PHYS advisor to discuss course sequencing and availability. †

Year Three	Fall	CRS
	PHYS 3211 ^{† PE}	4
	PHYS 3120 ^{† PE}	3
	PHYS 3711 ^{† PE}	2
	CLAS Foreign Language Semester I	5
Total Credit Hours	14	

Spring	CRS
PHYS 3411 ^{† PE}	3
PHYS Upper-Division Elective [†]	3
PHYS 3721 ^{† PE}	2
CU Denver Core International Perspectives	3
CLAS Foreign Language Semester II	5
Total Credit Hours	16

Year Four	Fall	CRS
	PHYS 4711 ^{† PE}	2
	PHYS 4331 ^{† PE}	4
	General Elective	3
	CLAS Social Science	3
	Upper-Division General Elective	3
Total Credit Hours	15	

Spring	CRS
PHYS 3811 ^{† PE}	4
PHYS Upper-Division Elective [†]	3
Upper-Division General Elective	3
Upper-Division General Elective	2
CU Denver Core Cultural Diversity	3
Total Credit Hours	15

^M Major Course Available ^C CU Denver Core Course ^{PE} Prerequisite Enforced ^{PR} Prerequisite Recommended