College of Liberal Arts and Sciences
UNIVERSITY OF COLORADO **DENVER**

PHYSICS – PURE & APPLIED

Bachelor of Science (B.S.) – Catalog Year Fall 2018

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 dual-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:

Clyde Zaidins
clyde.zaidins@ucdenver.edu
Visit the department website here
North Classroom (NC) 3123B
303-315-7365

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 passed
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, college, and major requirements
5. Residency: complete a minimum of 30 CLAS hours at CU Denver

Credits exceeding the following maximum hour restrictions will not be applied 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
- 9 semester hours of internship credit
- 8 semester hours of physical education credit

CAREER RESOURCES

Are you interested in learning about career and occupational options for this major? Visit the CU Denver Career Center located in the Tivoli Student Union (TV) Suite 267 to speak with a career counselor. The Career Center also provides *Career Briefs*, overviews of careers related to specific CU Denver majors, which include related links and resources to the particular field and show potential jobs related to the major. Access Career Briefs here.

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 B.S. Degree are required to complete the following minimum program requirements:

1. Students must declare their intention to major in Physics by the time they have completed 60 semester hours
2. Students must complete between 47 and 51 credit hours in physics (depending on the track chosen) to receive the degree of Bachelor of Science in Physics.
3. No grade below a C (2.0) can be used to meet the requirements for the major.
4. At least 12 semester hours of the requirements for the major must be completed at CU Denver.

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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	
PHYS Required Courses		
PHYS 2311 General Physics I: Calculus-Based	4	**Prerequisite: MATH1401*
PHYS 2351 Applied Physics Lab I	1	**PHYS2321 General Physics Laboratory I may be substituted only with advisor approval*
PHYS 2331 General Physics II: Calculus-Based	4	**Prerequisite: PHYS2311 & MATH2411*
PHYS 2361: Applied Physics Lab II	1	**PHYS2341 General Physics Laboratory II may be substituted only with advisor approval*
PHYS 2711 Vibrations and Waves	3	**Prerequisite: PHYS2331 & MATH2411*
PHYS 2811 Modern Physics I	4	**Prerequisite: PHYS2331 & MATH2411*
PHYS 3120 Methods of Mathematical Physics	3	**Prerequisite: MATH2421 & MATH3195*
PHYS 3711 Junior Lab I	2	**Prerequisite: PHYS2811*
PHYS 3811 Quantum Mechanics	4	**Prerequisite: PHYS2811 & PHYS3211*
Required Courses: Pure & Applied Track		
PHYS 3211 Analytical Mechanics	4	**Prerequisite: PHYS2711, MATH2421, & MATH3195*
PHYS 3411 Thermal Physics	3	**Prerequisite: PHYS2331, PHYS2811, & MATH 2421* **Corequisite: MATH 3195*
PHYS 3721 Junior Lab II	2	**Prerequisite: PHYS3711*
PHYS 4711 Senior Lab I or a computational physics course approved by advisor	2	**Prerequisite: PHYS3721; See department for approved courses*
PHYS 4331 Principles of Electricity and Magnetism	4	**Prerequisite: PHYS 2331 and PHYS3120* *Note: PHYS4351 with a C or higher may also fulfill this requirement*
PHYS-related electives at 3000-level of above	6	**See department for approved courses*
Required Ancillary Courses		
MATH 1401 Calculus I	4	**Prerequisite: Placement*
MATH 2411 Calculus II	4	**Prerequisite: C- or higher in MATH1401*
MATH 2421 Calculus III	4	**Prerequisite: C- or higher in MATH2411*
MATH 3195 Linear Algebra and Differential Equations **or** both MATH 3191 Applied Linear Algebra and MATH 3200 Elementary Differential Equations	4 - 6	**B- or higher in MATH2411 (recommended)*
Estimated General Electives	0	*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*

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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]	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]	4
PHYS 2311 and PHYS 2351	5
Total Credit Hours	**15**

Year Two

Fall	CRS
MATH 2421 [PE]	4
PHYS 2331 and PHYS 2361	5
CLAS Communicative Skills	3
CLAS Humanities	3
Total Credit Hours	**15**

Spring	CRS
PHYS 2711	3
PHYS 2811	4
CLAS Behavioral Science	3
MATH 3195	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 3120†	3
PHYS 3711†	2
PHYS 3211†	4
CLAS Foreign Language Semester I	5
Total Credit Hours	**14**

Spring	CRS
PHYS 3411†	3
PHYS Upper-Division Elective†	3
PHYS 3721†	2
CU Denver Core International Perspectives	3
CLAS Foreign Language Semester II	5
Total Credit Hours	**16**

Year Four

Fall	CRS
PHYS 4711†	2
PHYS 4331†	4
General Elective	3
CLAS Social Science	3
Upper-Division General Elective	3
Total Credit Hours	**15**

Spring	CRS
PHYS 3811†	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* [PE] *Prerequisite Enforced* [PR] *Prerequisite Recommended*