

## FOR TRANSFER STUDENTS

### PROGRAM OVERVIEW

The department of Physics at the University of Colorado Denver enriches understanding of how the world works by incorporating physics in every aspect of life. Good intuition about how things work has been, since the time of Galileo, a hallmark of physicists.

CU Denver's faculty is committed to providing substantive applied research experiences for our undergraduate students by incorporating aspects of every day life into their classrooms and research. A major in physics is one of the few academic degree programs that prepares its students for an amazing array of careers including computer analyst, engineer, technical writer, industrial marketer, doctor, and lawyer. Our faculty is committed to provide students with opportunities for laboratory experience in a research environment on such projects as:

- Applying chaos and complex systems theory to problems ranging from the onset of turbulence in fluid flows to the erratic motions of loads hanging from cranes aboard ships at sea
- Study of quasar jets and other associated dynamical properties, supernovae and nucleosynthesis
- Superconducting Quantum Interference Devices (SQUIDs) specifically the fabrication of microelectronic SQUIDs
- Applying non-linear dynamics and stochastic modeling to biological systems to understand how variations in genotype can lead to unique behavior
- Developing detection techniques in the search for the Dark Matter component of our Universe
- Applying physics to archaeology and historic preservation
- Developing ways to help students learn physics better

Students are strongly encouraged to consult with the Physics advisor, meet physics faculty engaged in Pure & Applied Physics research, attend departmental seminars, and explore ways that Physics relates to research undertaken by faculty in other disciplines.

### 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 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](mailto:clas_advising@ucdenver.edu)

Visit the CLAS Advising website [here](#)

North Classroom (NC) 1030

303-315-7100

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

#### Physics Major Advising

[CLAS Major Advisor Contact Information](#)

Visit the department website [here](#)

North Classroom (NC) 3123 B

303-315-7390

*For questions about admission requirements, transfer policies, applying, and the transfer process contact:*

#### Office of Admissions

[admissions@ucdenver.edu](mailto:admissions@ucdenver.edu)

Visit the Admissions website [here](#)

Student Commons Building (SCB) 1005

303-315-2601

### 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 credit 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) credit hours
4. Complete all CU Denver Core, CLAS, and major requirements
5. Complete a minimum of 30 CLAS credit hours with letter grades at CU Denver

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

- 16 credit hours Pass/Fail
- 12 credit hours of Independent Study/Directed Research
- 12 credit hours of internship credit
- 8 credit hours of physical education credit

### PROGRAM REQUIREMENTS & POLICIES

**The following program requirements are based on degree requirements for the current Catalog year at CU Denver and are subject to change. Students are responsible for completing degree requirements based on the Catalog year for which they are admitted.**

**Students are responsible for meeting with the major advisor 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 61 credit hours, including a minimum of 39 PHYS credit hours and 16 credit hours in ancillary 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 courses that apply to the major and must achieve a minimum cumulative major GPA of 2.0. Courses taken using P+/P/F or S/U grading cannot apply to major requirements.
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 credit hours.
6. Students pursuing the 4+1 track must apply and be accepted for participation in the BS/MIS program prior to completion of the BS degree in consultation with both the undergraduate and graduate advisors. Students must complete a 4+1 intent form to formally declare this program, as they work very closely with undergraduate and graduate advisors to ensure they are on track and completing requirements as necessary. A maximum of 12 credit hours of graduate level courses that are applied to the undergraduate degree will apply to the graduate degree. Students must also earn a B- or higher in graduate level coursework, for it to apply to the Integrated Science, MIS.
7. 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.

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PROGRAM REQUIREMENTS & POLICIES (CONTINUED)

8. Students earning a Physics major cannot earn a Physics minor.
9. All physics majors must complete a capstone thesis or capstone project. A thesis is required for all students wishing to graduate with departmental honors.
10. The physics faculty also encourage all physics majors to enroll in PHYS 1450, 3450, and 4450 Professional Development I, II, and III seminar courses.

COURSEWORK THAT CAN BE COMPLETED AT PREVIOUS INSTITUTION

The following is a “bucket” of requirements students can complete prior to transferring to CU Denver, including equivalent Colorado Community College System (CCCS) courses. To determine the equivalencies of courses to be completed at non-CU Denver institutions, students can visit [www.transferology.com](http://www.transferology.com). **It is critical students connect with a CU Denver academic advisor to ensure planned courses will transfer and apply to CU Denver degree requirements.** All non-CU Denver coursework must be completed with a C- or better to be eligible for transfer.

Students interested in completing an Associate (A.A. or A.S.) Degree or a [Colorado Statewide Transfer Articulation Agreement or Degree with Designation \(DWD\)](#) must work with their community/junior college academic advisor to create an academic plan that accounts for all degree or transfer articulation agreement requirements. Colorado Community College Students may also explore the option to complete [Reverse Transfer](#) at CU Denver.

CU Denver Requirements	CU Denver Credits	CCCS Equivalent Courses & Notes	CCCS Credits
<b>CU Denver Core Curriculum Requirements</b>	<b>34 - 40</b>		
ENGL 1020 – Core Composition I	3	ENG 1021	
ENGL 2030 – Core Composition II	3	ENG 1022	
Mathematics	3 - 4	MAT 2410 <i>recommended</i> or GT-MA1	
Arts	3	GT-AH	
Humanities	3	GT-AH or GT-HI	
Behavioral Sciences	3 - 4	GT-SS	
Social Sciences	3 - 4	GT-SS or GT-HI*	
Natural/Physical Science with lab	4 - 5	PHY 2111 or GT-SC1	
Natural/Physical Science without lab or Math	3 - 5	PHY 2112 or GT-SC2 or GT-MA1 ( <i>except the course used for Core Math</i> ) or GT-SC1	
International Perspectives	3	Additional GT-AH, HI, SS* ( <i>see note below</i> )	
Cultural Diversity	3	<i>To be completed at CU Denver. This requirement must be completed with an upper-division course and CCCS courses will not apply.</i>	---
<b>CLAS Graduation Requirements</b>	<b>15 - 29</b>		
CLAS Communicative Skills	3	COM 1150 or PHI 1013	
CLAS Second Language	0 - 10	(e.g.) SPA 1012 or ASL 1122 <b>Students have several options to fulfill this requirement. Please consult a CU Denver CLAS Academic Advisor.</b>	
CLAS Humanities	3	Any transferrable LIT, HIS, HUM, or PHI course	
CLAS Behavioral Sciences	3 - 4	Any transferrable ANT, COM, or PSY course ( <i>except GT-SC courses</i> )	
CLAS Social Sciences	3 - 4	Any transferrable ECO, ETH, GEO, PSC, or SOC course ( <i>except GT-SC courses</i> )	
CLAS Natural/Physical Science without lab	3 - 5	MAT 2420 or GT-SC1 <b>If you completed only one science course with a lab for the CU Denver Core Curriculum, this course must have an associated lab.</b>	
<b>PHYS Major Courses</b>	<b>29</b>		
MATH 1401 Calculus I	4	MAT 2410 - <i>Course can fulfill CU Denver Core Mathematics</i>	
MATH 2411 Calculus II	4	MAT 2420 - <i>Course can fulfill CU Denver Core Mathematics</i>	
MATH 2421 Calculus III	4	MAT 2430 - <i>Course can fulfill CU Denver Core Mathematics</i>	
MATH 3195 Linear Algebra & Differential Equations	4	MAT 2562 *Note: CCCS courses are counted as lower-division credits at CU Denver	
PHYS 2311 & 2321 General Physics I with lab	5	PHY 2111	
PHYS 2331 & 2341 General Physics II with lab	5	PHY 2112	
PHYS 2811 Modern Physics I	3	PHY 2113	
<b>Minimum Applicable Transfer Credits Recommended:</b>	<b>60</b>	<i>Students completing less than 60 applicable transfer credits will have additional credits to complete at CU Denver. Students needing general elective credits should consult a CU Denver CLAS Academic Advisor.</i>	

\*The applicability of Guaranteed Transfer (GT Pathways) courses to specific CU Denver Core Curriculum requirements requires completion of a block of five courses: two GT-AH courses; one GT-HI course; one GT-SS course; and one additional GT-AH, GT-HI, or GT-SS course.

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SAMPLE PLAN – COURSEWORK TO BE COMPLETED AT CU DENVER

Based on successful completion of 60 applicable transfer credits and the complete “bucket” of requirements outlined above, students would have the following remaining to complete at CU Denver. At CU Denver, students must tailor this plan based on the evaluation of previously completed college coursework (e.g., AP, IB, CLEP, dual/concurrent enrollment, and transfer credit), course availability, individual preferences related to course load, summer term courses, part-time or full-time student status, or add-on programs such as minors or double-majors.

**Note: this plan assumes students have completed the CLAS Second Language proficiency requirement.** Students must demonstrate second language proficiency through a 2<sup>nd</sup> semester college-level course equivalent (e.g., SPA 1012 or ASL 1122) with a C- or higher, satisfactory proficiency testing (CU Denver Department of Modern Languages Placement Testing, BYU FLATS, CLEP), or submitting their high school transcript demonstrating completion of a 2<sup>nd</sup> year (Level II) high school course with a minimum grade of “C-” (1.7) in the 2<sup>nd</sup> semester of the 2<sup>nd</sup> year or later. Students may have additional options to fulfill this requirement and should consult a CU Denver CLAS Academic Advisor. **Students who have not fulfilled this requirement must work with a CU Denver CLAS Academic Advisor to modify this plan.**

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

Year Three	Fall		CRS	Spring		CRS
		PHYS 3751 <sup>† PE</sup>		1	PHYS 2711 <sup>† PE</sup>	
	PHYS 3711 <sup>† PE</sup>		2	PHYS 3411 <sup>† PE</sup>		3
	CU Denver Core Cultural Diversity		3	PHYS 3711 <sup>† PE</sup>		2
	General Elective		3	PHYS 4751 or PHYS 4711 <sup>† PE</sup> (see major advisor)		0-2
	General Elective		3	Upper-Division General Elective		3
	General Elective		3	Upper-Division General Elective		3
	<b>Total Credit Hours</b>		<b>15</b>	<b>Total Credit Hours</b>		<b>15-17</b>

Select either the Pure and Applied Physics or 4+1 track and complete the required courses for that track.

Year Four	Fall		CRS	Spring		CRS
		<b>Pure and Applied Physics Track</b>	<b>4+1 Track</b>	-	<b>Pure and Applied Physics Track</b>	<b>4+1 Track</b>
	PHYS 4211 & PHYS 4212	MINS 5200	3-4	PHYS 4311 & PHYS 4312	PHYS 5311	3-4
	PHYS Upper-Division	PHYS 5211	3	PHYS Upper-Division Elective <sup>†</sup>	Graduate Level STEM Course	3
	PHYS 4751 or PHYS 4711 <sup>† PE</sup> (see major advisor)		0-2	Upper-Division General Elective		3
	PHYS 3120 <sup>† PE</sup>		3	Upper-Division General Elective		3
	PHYS 3211 <sup>† PE</sup>		4	Upper-Division General Elective		3
	<b>Total Credit Hours</b>		<b>13-16</b>	<b>Total Credit Hours</b>		<b>15-16</b>

<sup>M</sup> Major Course Available    <sup>C</sup> CU Denver Core Course    <sup>PE</sup> Prerequisite Enforced    <sup>PR</sup> Prerequisite Recommended