

Ph.D. in Physics Degree Requirements

Directed Research Requirements	Ph.D. Dissertation Requirements	Coursework Requirements	Total (Cr)
27	15	18	60
45%	25%	30%	100%

1. Directed Research Requirements

Directed Research Requirements (27 Cr)					
Course Code	Course Title	Cr	L	P	Prerequisite
PHY 781	Ph.D. Directed Research 1	3	0	9	
PHY 782	Ph.D. Directed Research 2	3	0	9	
PHY 783	Ph.D. Directed Research 3	3	0	9	
PHY 784	Ph.D. Directed Research 4	3	0	9	
PHY 785	Ph.D. Directed Research 5	3	0	9	
PHY 786	Ph.D. Directed Research 6	3	0	9	
PHY 787	Ph.D. Directed Research 7	3	0	9	
PHY 788	Ph.D. Directed Research 8	3	0	9	
PHY 789	Ph.D. Directed Research 9	3	0	9	

2. Ph.D. Dissertation Requirements

Ph.D. Dissertation Requirements (15 Cr)					
Course Code	Course Title	Cr	L	P	Prerequisite
PHY 795	Ph.D. Dissertation 1	3	0	9	
PHY 796	Ph.D. Dissertation 2	3	0	9	
PHY 797	Ph.D. Dissertation 3	3	0	9	
PHY 798	Ph.D. Dissertation 4	3	0	9	
PHY 799	Ph.D. Dissertation 5	3	0	9	

3. Coursework Requirements

The aim of coursework requirements is to provide students in the Ph.D. program in Physics with special advanced knowledge essential for completion of doctoral research. PhD candidates have to take at least four courses from the 700-level courses in the Course Catalog. Students have to take an additional two courses; these two courses may be taken from the set of 700-level courses in the Course Catalog or may be taken from 600-level courses offered in the M.Sc. program in Physics. Ph.D. candidates may not register for 600-level courses that they have taken during the course of previous studies before being admitted to the Ph.D. program.

Coursework Requirements (18 Cr)					
Course Code	Course Title	Cr	L	P	Prerequisite
600-Level or 700-Level PHY Electives		6	6	0	
700-Level PHY Electives		12	12	0	

1. Physics Electives

The student must select a minimum of 18 Cr from the following list At least four courses must be from the 700-level courses					
Course Code	Course Title	Cr	L	P	Prerequisite
MATH 503	Advanced Linear Algebra	3	3	0	
NANENG 616	Nanophotonics	3	3	0	
PHY 604	Electrodynamics II	3	3	0	
PHY 605	Statistical Mechanics I	3	3	0	
PHY 606	Statistical Mechanics II	3	3	0	
PHY 608	Mathematical Physics I	3	3	0	
PHY 611	Quantum Field Theory1	3	3	0	
PHY 617	Chemical Biology	3	3	0	
PHY 618	Cellular Biochemistry	3	3	0	
PHY 619	Applied molecular modelling	3	3	0	
PHY 620	Optics and Spectroscopy	3	3	0	
PHY 621	Computational Physics	3	3	0	
PHY 712	Quantum Field Theory 2	3	3	0	
PHY 713	General Relativity and Cosmology	3	3	0	
PHY 714	Supersymmetry	3	3	0	
PHY 715	Standard Model	3	3	0	
PHY 716	Group Theory and Lie Algebra	3	3	0	
PHY 721	Computational Physics	3	3	0	
PHY 722	Biological Physics	3	3	0	
PHY 723	Selected topics in High Energy Physics	3	3	0	
PHY 724	Selected topics in Astrophysics	3	3	0	
PHY 725	Selected topics in Computational Physics	3	1	2	