

**IZMIR INSTITUTE OF TECHNOLOGY**  
**GRADUTE SCHOOL OF ENGINEERING AND SCIENCES**  
**DEPARTMENT OF PHYSICS**  
**CURRICULUM OF THE Ph.D. PROGRAM IN PHYSICS**  
**(FOR STUDENTS ENTERING WITH A BS DEGREE)**

CORE COURSES				ECTS	PRCD/CRCO
PHYS	501	Mathematical Methods of Physics I	(2+2)3	7	
PHYS	503	Analytical Mechanics	(2+2)3	8	
PHYS	504	Statistical Mechanics	(2+2)3	7	
PHYS	505	Electromagnetic Theory I	(2+2)3	9	
PHYS	506	Electromagnetic Theory II	(2+2)3	9	
PHYS	507	Quantum Mechanics I	(2+2)3	9	
PHYS	508	Quantum Mechanics II	(2+2)3	9	
PHYS	592	Graduate Seminar II*	(0+2)NC	7	
PHYS	599	Scientific Research Methods and Ethics	(0+2)NC	8	
PHYS	600	Ph.D. Thesis	(0+1)NC	26	
PHYS	8XX	Special Studies	(8+0)NC	4	

\*All Ph.D. students must register Graduate Seminar II course until the beginning of their 6<sup>th</sup> semester.

Total minimum credit: 42  
Minimum number of courses with credit: 14

ELECTIVE COURSES				ECTS	PRCD/CRCO
PHYS	502	Mathematical Methods of Physics II	(3+0)3	8	
PHYS	511	Condensed Matter Physics I	(3+0)3	7	
PHYS	512	Condensed Matter Physics II	(3+0)3	7	
PHYS	513	Physics of Semiconductors	(3+0)3	7	
PHYS	514	Physics of Semiconducting Devices	(3+0)3	7	PRCD:PHYS 511
PHYS	515	Introduction to Superconductivity	(3+0)3	7	
PHYS	516	Superconducting Electronics I	(3+0)3	7	
PHYS	517	Superconducting Electronics II	(3+0)3	7	
PHYS	518	Thin Film Technology	(3+0)3	7	
PHYS	519	Surface Analysis Techniques	(3+0)3	7	
PHYS	520	Application of Nanotechnology	(3+0)3	7	
PHYS	521	Low Temperature Physics	(3+0)3	7	
PHYS	522	Advanced Experimental Methods	(3+0)3	7	
PHYS	525	Atomic and Molecular Spectra	(3+0)3	7	
PHYS	530	Quantum Optics	(3+0)3	7	
PHYS	531	Photonic Structure	(3+0)3	7	
PHYS	532	Applied Quantum Optics	(3+0)3	8	
PHYS	540	Quantum Field Theory of Solids	(3+0)3	8	
PHYS	541	Quantum Theory of Many Particle Systems I	(3+0)3	8	PRCD:PHYS 504-508
PHYS	542	Quantum Theory of Many Particle Systems II	(3+0)3	8	PRCD:PHYS 541
PHYS	551	Particle Physics I	(3+0)3	8	
PHYS	552	Particle Physics II	(3+0)3	8	PRCD:PHYS 551 or consent of
PHYS	555	Quantum Field Theory I	(3+0)3	8	PRCD:PHYS 505-507 or conse
PHYS	556	Quantum Field Theory II	(3+0)3	8	PRCD:PHYS 555
PHYS	557	Quantum Field Theory III	(3+0)3	8	PRCD:PHYS 556
PHYS	559	Symmetries in Particle Physics	(3+0)3	8	
PHYS	560	Group Theory for High Energy Physics	(3+0)3	8	

PHYS	561	Fundamentals of the Standard Model of Particle Physics	(3+0)3	8	
PHYS	562	Supersymmetry I	(3+0)3	7	PRCD:PHYS 555
PHYS	563	Supersymmetry II	(3+0)3	7	PRCD:PHYS 562
PHYS	570	General Relativity	(3+0)3	8	
PHYS	575	Astrophysics I	(3+0)3	8	
PHYS	576	Astrophysics II	(3+0)3	7	
PHYS	577	Galaxies and Cosmology	(3+0)3	8	
PHYS	578	Structure and Evolution of Stars	(3+0)3	8	
PHYS	585	Atmospheric Physics	(3+0)3	8	
PHYS	586	Atmospheric Radiation	(3+0)3	8	
PHYS	587	Climate Modeling	(3+0)3	8	
PHYS	588	Cloud Physics	(3+0)3	8	
PHYS	590	Special Topics in Physics	(3+0)3	7	