



Curriculum *Experimental Nano-physics and Quantum Technologies*

Year	Name of the course	Hours	ECTS	SSD	Term	Notes	✓
First year	B - Distinctive courses (Corsi caratterizzanti)		42				
	<i>Mandatory courses</i>						
	Laboratory of nanostructures	60	6	FIS/01	I	II	
	Magnetism, spintronics and quantum technologies	48	6	FIS/01	I		
	Laboratory of electron microscopy and holography	48	6	FIS/01		II	
	Synchrotron radiation: basics and applications	48	6	FIS/01	I		
	<i>Choose three courses among</i>						
	Physics of semiconductors	48	6	FIS/03		II	<input type="checkbox"/>
	Fundamentals of condensed matter physics	48	6	FIS/03	I		<input type="checkbox"/>
	Nanoscience and quantum materials	48	6	FIS/03		II	<input type="checkbox"/>
	Laboratory of quantum simulation of materials	60	6	FIS/03	I	II	<input type="checkbox"/>
	Elementary particles	48	6	FIS/04	I		<input type="checkbox"/>
	C - Related courses (Corsi affini)		18				
	<i>Choose three courses among</i>						
	Advanced spectroscopic and imaging methods	48	6	FIS/01		II	<input type="checkbox"/>
	Nano-mechanics	48	6	FIS/01	I		<input type="checkbox"/>
	Statistical mechanics and phase transitions	48	6	FIS/03		II	<input type="checkbox"/>
	Advanced condensed matter theory	48	6	FIS/03		II	<input type="checkbox"/>
	Theoretical astroparticle physics	48	6	FIS/04		II	<input type="checkbox"/>
	Physics education: theoretical and experimental methods	48	6	FIS/08		II	<input type="checkbox"/>
	Numerical algorithms for signal and image processing	36	6	MAT/08		II	<i>M.Sc in Mathematics - IT</i> <input type="checkbox"/>
	Laboratory of machine learning and advanced computing for physics	60	6	FIS/03	I	II	
Second year	B - Distinctive courses (Corsi caratterizzanti)		6				
	<i>Choose one course among</i>						
	Advanced quantum mechanics	48	6	FIS/02	I		<input type="checkbox"/>
	Quantum information processing	48	6	FIS/02	I		<input type="checkbox"/>
	D - Free choice courses (Corsi a scelta libera)		12				
	<i>Choose at least 12 ECTSs among all of the above courses, or any other course offered at UNIMORE</i>						
	E - Thesis project and dissertation		36				
	F - Professional preparation (Corsi professionalizzanti)		6				
	<i>Choose 6 ECTS among</i>						
	Good practices in research		3		I		<input type="checkbox"/>
Physics and society		3		I		<input type="checkbox"/>	
Science-based innovation		6	<i>Attendance of CBI/SUGAR Unimore projects (see https://clab.unimore.it/)</i>			<input type="checkbox"/>	
High-performance-computing in sciences		3	<i>Attendance of CINECA HPC courses (see https://eventi.cineca.it/en/hpc/catalogue)</i>			<input type="checkbox"/>	