UNIVERSITÀ
DEGLI STUDI DI TRIESTE

Area dei Servizi Istituzionali
Unità di staff Dottorati di ricerca

ATTACHMENT 9 LAST REVISED 05/05/2021

PhD IN NANOTECHNOLOGY OVERVIEW

IN BRIEF

Lines of research	1	Development of new techniques for the study, manipulation and visualization of nanomaterials and nanostructured materials at the nanoscale
	2	Development of sensors for the detection of bio-molecules or compounds present on a very low concentration
	3	Study of the relationships between structures and properties of materials
	4	Synthesis and engineering of nanomaterials and nanostructured materials
	5	Applications of nanotechnology, nanomaterials and nanostructured materials for research in the energy sector
	6	Theoretical approaches and molecular modelling for nanomaterials and nanotechnology related phenomena
	7	Application of nanotechnology in the biological, medical and pharmaceutical sectors
Administrative location	University of Trieste	
Organizing Department	Department of Physics	
Participating Departments	Department of Engineering and Architecture	
	Department of Chemical and Pharmaceutical Sciences	
	Department of Life Sciences	
	Department of Medicine, Surgery and Health Sciences	
Duration	3 years	
Attendance abroad that entitles to a scholarship increase - min. max. of months for each PhD student (over 3 years)	2 - 18	
Official language	English The official language for all activities of the PhD Course is English, also with the aim to favor the presence of students from abroad. Students have to present their annual research activity to a commission, the research reports, the presentations at the annual congress of the school in English language. The courses organized by the school are carried out in English. The PhD thesis has to be written in English.	
Subject Areas *(in alphabetical code order)*	02	PHYSICS
	03	CHEMISTRY
	05	BIOLOGY
	06	MEDICINE
	09	INDUSTRIAL AND INFORMATION ENGINEERING
Macro Research Fields *(in alphabetical code order)*	02/B	PHYSICS OF MATTER
	03/A	ANALYTICAL AND PHYSICAL CHEMISTRY
	03/B	INORGANIC CHEMISTRY AND APPLIED TECHNOLOGIES
	03/C	ORGANIC, INDUSTRIAL AND APPLIED CHEMSTRY
	03/D	MEDICINAL AND FOOD CHEMISTRY AND APPLIED

		TECHNOLOGIES
	05/E	EXPERIMENTAL AND CLINICAL BIOCHEMISTRY AND MOLECULAR BIOLOGY
	05/G	EXPERIMENTAL AND CLINICAL PHARMACOLOGY
	06/A	PATHOLOGY AND LABORATORY MEDICINE
	06/F	INTEGRATED CLINICAL SURGERY
	06/M	PUBLIC HEALTH
	09/D	CHEMICAL AND MATERIALS ENGINEERING
Scientific Disciplinary Sectors *(in alphabetical code order)*	BIO/10	BIOCHEMISTRY
	BIO/14	PHARMACOLOGY
	CHIM/02	PHYSICAL CHEMISTRY
	CHIM/03	GENERAL AND INORGANIC CHEMISTRY
	CHIM/06	ORGANIC CHEMISTRY
	CHIM/07	PRINCIPLES OF CHEMISTRY FOR APPLIED TECHNOLOGIES
	CHIM/08	PHARMACEUTICAL CHEMISTRY
	FIS/03	PHYSICS OF MATTER
	ING-IND/22	APPLIED PHYSICAL CHEMISTRY
	ING-IND/24	FUNDAMENTALS OF CHEMICAL ENGINEERING
	MED/04	EXPERIMENTAL MEDICINE AND PATHOPHYSIOLOGY
	MED/28	ORAL DESEASES AND DENTISTRY
	MED/44	OCCUPATIONAL MEDICINE
Domain European Research Council	PE	PHYSICAL SCIENCES AND ENGINEERING
	LS	LIFE SCIENCES
ERC Panels	PE2	FUNDAMENTAL CONSTITUENTS OF MATTER: PARTICLE, NUCLEAR, PLASMA, ATOMIC, MOLECULAR, GAS, AND OPTICAL PHYSICS
	PE3	CONDENSED MATTER PHYSICS: STRUCTURE, ELECTRONIC PROPERTIES, FLUIDS, NANOSCIENCES, BIOLOGICAL PHYSICS
	PE4	PHYSICAL AND ANALYTICAL CHEMICAL SCIENCES: ANALYTICAL CHEMISTRY, CHEMICAL THEORY, PHYSICAL CHEMISTRY/CHEMICAL PHYSICS
	PE5	SYNTHETIC CHEMISTRY AND MATERIALS: NEW MATERIALS AND NEW SYNTHETIC APPROACHES, STRUCTURE-PROPERTIES RELATIONS, SOLID STATE CHEMISTRY, MOLECULAR ARCHITECTURE, ORGANIC CHEMISTRY
	PE7	SYSTEMS AND COMMUNICATION ENGINEERING: ELECTRICAL, ELECTRONIC, COMMUNICATION, OPTICAL AND SYSTEMS ENGINEERING
	PE8	PRODUCTS AND PROCESSES ENGINEERING: PRODUCT AND PROCESS DESIGN, CHEMICAL, CIVIL, ENVIRONMENTAL, MECHANICAL, VEHICLE ENGINEERING, ENERGY PROCESSES AND RELEVANT COMPUTATIONAL METHODS
	PE11	MATERIALS ENGINEERING: ADVANCED MATERIALS DEVELOPMENT: PERFORMANCE ENHANCEMENT, MODELLING, LARGE-SCALE PREPARATION, MODIFICATION, TAILORING, OPTIMISATION, NOVEL AND COMBINED USE OF MATERIALS, ETC.
	LS7	PREVENTION, DIAGNOSIS AND TREATMENT OF HUMAN DISEASES:

		MEDICAL TECHNOLOGIES AND TOOLS FOR PREVENTION, DIAGNOSIS AND TREATMENT OF HUMAN DISEASES, THERAPEUTIC APPROACHES AND INTERVENTIONS, PHARMACOLOGY, PREVENTATIVE MEDICINE, EPIDEMIOLOGY AND PUBLIC HEALTH, DIGITAL MEDICINE
	LS9	BIOTECHNOLOGY AND BIOSYSTEMS ENGINEERING: BIOTECHNOLOGY USING ALL ORGANISMS, BIOTECHNOLOGY FOR ENVIRONMENT AND FOOD APPLICATIONS, APPLIEDPLANT AND ANIMAL SCIENCES, BIOENGINEERING AND SYNTHETIC BIOLOGY, BIOMASS AND BIOFUELS, BIOHAZARDS

WHO'S WHO	
Chair	Prof. Alberto MORGANTE – Department of Physics – University of Trieste – phone +39 040558.3373 - 0403756475 - 0403758286; email morgante@iom.cnr.it
Vice	Prof. Paola POSOCCO – Department of Engineering and Architecture – University of Trieste – phone +39 040558.3448; email paola.posocco@dia.units.it
PhD Academic Board	List of members
Web site	http://web.units.it/dottorato/nanotecnologie/en
Courses and seminars	http://web.units.it/dottorato/nanotecnologie/en/node/1829
Email	dottorato.nanotecnologie@units.it
Course description and objectives	The main objective of the school is to prepare researchers for designing, building and characterizing nanomaterials and nanostructured materials (NSM), tools and devices that meet the growing applicative needs to make the industrial production more effective, affordable and sustainable and to meet the growing needs of our society and promoting its progress. The school is meant for graduates in physics, chemistry, engineering, biology, biotechnology, medicine, dentistry, pharmacy and pharmaceutical technology who aim at acquiring high-level interdisciplinary competence through courses and seminars covering also fields different from their own, while carrying out research projects in the framework of collaborations with (inter)national research institutions and industries. The main objectives of the research can be summarized as follows: 1) Synthesis and engineering of nanomaterials and NSM; 2) Development of new techniques for study, manipulate and visualize nanomaterials and NSM at the nanoscale; 3) Study of the relationships between structure and properties of nanomaterials; 4) Theoretical studies and molecular approaches for the investigation of NMS and related phenomena; 5) Development of sensors for the detection of bio-molecules or compounds at very low concentrations; 6) Application of nanotechnology, nanomaterials and NSM in the energy sector; 7) Application of nanotechnology, nanomaterials and NSM in the biological, pharmaceutical, and medical sectors.
Job placement opportunities	Possible employment opportunities for a PhD doctor in Nanotechnology have been growing in the last years, especially in Italy, where the implementation of the nanotechnologies in industry has been demanding for an increasing number of figures having a strong multidisciplinar background and training. The areas of employment are as many as those involving the nanotechnologies such as for example: food, energy, electronics, manufacturing, health, biology, biotechnology, physics, chemistry, cultural heritage. The PhD Program in Nanotechnology of the University of Trieste, characterized by a strong multidisciplinarity, trains scientists suitable to become researchers/responsible of R&D activities/responsible of laboratories or projects in public institutions or private companies where are requested people able to manage research projects and activities involving specialists from various disciplines. PhD scientists in Nanotechnology are prepared to work in the management of industries and service companies in the field of advanced technologies. Stable collaborations with the local research Institutions offer the PhD students in

	Nanotechnology several job placement opportunities.	
Main cooperating international Universities and Research Institutions	1	University of Cadice, Spain
	2	University of Basque Country/CIC Biomagune/CIC Nanogune, Spagna
	3	Columbia University, USA
	4	PCAM – Phisics and chemistry of advanced materials
	5	Institut Jožef Stefan, Slovenia