ANNEX A

Action IV.5 – "Pd.D. Courses on Green thematics"

SNSI Thematic area	Positions	Bound Research Thematics	Pd.D. Course
Health, nutrition, quality of life	**7**	*Personalized procedures to counteract the negative effects on the health of fragile individuals due to climate change*	**Environmental sustainability and wellbeing**
		Study of the effects of anthropic activities and global changes on a community of Alpine mammals	
		Design and promotion of smart urban mobility systems that favour the regular practice of physical activity and improve social, environmental and economic features	
		Extraction, characterization and machine learning analysis of complex mixtures of biomolecules derived from the fermentation of agro-industrial biomass for pharmaceutical, cosmeceutical and nutraceutical applications	**Chemistry**
		Impact of sustainable agronomic practices for the improvement of agricultural production	
		Green approaches to the design and synthesis of polyfunctional pseudopeptide radionuclide chelators for teranostic applications	
		Development of eco-sustainable and nutrigenomics-based tailor-made foods, integrated into the Mediterranean diet model, to promote the Bioeconomy and the individual and population health	
Smart and Sustainable Industry, Energy and Environment	**31**	*Use of probiotics agents against pathogenic vibrios in clam and oyster farming;*	**Environmental sustainability and wellbeing**
		Efficacy studies of ketogenic molecules obtained with enzymatic synthesis from waste recovery material;	
		Microalgae-based green technologies: value chain from phytoremediation to crop biostimulation;	
		Development and dissemination of sustainability models of Italian mollusc farming;	
		Green technologies, complementarities, and economic development	
		Managerial tools for Public Value planning, creation and reporting in waste management and treatment services: the challenge of the UN's 2030 Agenda;	
		Integrated innovations for the circular economy and decarbonisation in production cooperatives for environmental, economic and social sustainability;	
		Economic and energetic analysis of the production cycle of new products based on legumes and vegetables, intended as a means to reduce the energy consumption of food with the same caloric intake	
		Decarbonizzazione, sostenibilità e uso efficiente di sistemi di conversione, accumulo e distribuzione dell'energia	
		Circular and green business model innovation: analysis, processes and methods	
		Chemical-biological profiling of snail secretion extracts: technological, biological and applicative aspects;	**Chemistry**
		Continuous extraction of biomolecules from marine waste	
		Zootechnical wastewater treatments, reduction of the nitrogen load and production of natural amendments for agricultural soils and cultivation substrates	
		Mathematical modelling of multiphase and multicomponent subsurface flow and transport for the rehabilitation and prevention of pollution in industrial areas;	

		Heteroatom-containing compounds characterization in biomass that inhibits or reduces the biomass feedstock transformation into biofuel and bioenergy	
		Nuova generazione di accumulatori di energia litio-aria	
Smart and Sustainable Industry, Energy and Environment	**31**	*Photoresponsive semiconductor and hybrid photoelectrochemical interfaces for solar fuel production, environmental remediation and organic photoelectrosynthesis;*	**Chemistry**
		Preparation and Characterization of new eco-sustainable polymeric materials based on extracts from agri-food waste	
		Development of keratin-based novel materials for applications in biomedical and industrial fields;	
		Reuse of waste as soil and seabed conditioner, for water decontamination and soil regeneration	
		Development of green analytical techniques for the recovery and valorisation of minor cannabinoids and other bioactive molecules from hemp industry by-products;	
		Sustainable methods for the industrial production of biopharmaceuticals: from the enzymatic synthesis to the purification through continuous processes with waste recycle and green solvent use;	
		Improving the food safety in food supply chain through aflatoxins characterization	
		Nanotechnological strategies for the delivery of biologically active molecules derived from agricultural processing waste: a green approach to realize nutraceuticals products.	
		Development of robotic technologies for the sustainable decommissioning of medial nuclear wastes;	**Physics**
		Development of innovative solar technologies based on recyclable and recycled materials;	
		Renewables and Energy Efficiency at district level for both residential and industrial users: an integrated approach to achieve energy and exergy efficiency on the widest parterre of final end users, grids and infrastructures, based on holistic and LCA approach, applied on open energy systems;	**Architecture and urban planning**
		Development of solutions for industrialized customized prefabricated building envelope to enable industrial Circular Economy: physical and BIM-based strategies and tools for product Life Cycle Thinking aimed to support green and sustainable-driven even predictable actions along the whole facade production process, from engineering design to disassembling, materials recovery and recycle;	
		Development and study of the mechanical behavior of innovative sustainable materials and structural systems from waste-derived raw materials and advanced additive manufacturing techniques in the framework of circular economy for the construction industry;	
		Waste Treatment: Reperimento di Critical Raw Materials dalle discariche di sfridi di rocce ornamentali granitoidi	
		Subsoil integrated analyses for the sustainable development of medium and low temperature geothermal energy;	
Digital Agenda, Smart Communities, Smart Mobility Systems	**4**	*Gas sensors for greenhouse gases monitoring with high spatio-temporal resolution;*	**Physics**
		Analysis of climatic markers and development of high-performance predictive models for the evaluation of potential production losses caused by climate changes;	
		Accessibility and sustainability of smart mobility. Design of sustainable and inclusive mobility systems based on the interaction between digital city services, self-driving or assisted vehicles, and citizens to improve the autonomy of fragile and disadvantaged users	**Architecture and urban planning**
		Tools towards sustainable design strategies: optimization of integrated BIM-Blockchain technologies and protocols for the	

		application of minimum environmental criteria, CAM, to the built environment and cultural heritage	