



Sant'Anna
Scuola Universitaria Superiore Pisa

Ph.D. in Translational Medicine
Teaching Activities Cycle 38° - a.y. 2022/2023

Lecturer	Title of the Course	Brief description	Hours	Compulsory
Angeloni, Lionetti, Passino, Recchia	Research methodology: from bench to bedside	As part of the course, the elements for understanding the methodological fundamentals of research in biomedicine will be provided, starting from basic in vitro research to clinical research through experimental research on small to large animal models. The different approaches will be illustrated by outlining strengths and weaknesses of the various experimental models	12	X
Dr. Giannoni/Prof Cocconi	Scientific communication	The Course aims to train the doctoral student in the preparation and presentation of scientific content. In a highly interactive mode, the knowledge elements aimed at developing both the skills for proper articulation and presentation of scientific data will be provided, both in oral and written form.	10	X
Dr.ssa Lorenzoni	Biostatistica	The Course aims to provide the theoretical basis for understanding and implementing, with critical awareness, the basic statistical and probabilistic methodologies applied to the biomedical field. Emphasis will be placed on the analysis of the most frequently used statistical tools for biomedical and clinical research using a “practical” approach.	16	X
Doc-esterno	Writing Scientific Articles in English” and “Presenting research at International conferences	The Course conducted by a native English speaker has the dual purpose of consolidating English language proficiency and developing both oral and written communication skills in science. Ample space is left for conversation and critical review of papers	30	X



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Dr. Giannoni	Journal clubs (3 per year)	The Course aims, through reading and reviewing scientific articles on various topics, to develop the ability to critically analyze scientific literature. The course is spread over the three-year period, and in rotation all students guided by the teacher present their review of an article to the rest of the class.	18	X
Prof.ssa Angeloni	Science communication for the Third Mission of the University	Communicating science, technology and innovation for the University's Third Mission' is a seminar course that aims to provide effective tools for communicating science, technology and innovation specifically in the context of the university's Third Mission. Third Mission is the set of activities with which university enters into direct interaction with society, beyond research and education: enhancement of intellectual or industrial property, academic entrepreneurship, intermediation and technology transfer, health protection, lifelong learning, public engagement and risk communication, open science and activities related to the Sustainable Development Goals. The course provides specific education and training for communication of science and technology contents outside strictly professional circles. The course includes 20 hours of frontal lessons with several more hours of exercise (writing and multimedia activities).	25	X
Prof. Recchia	Designing, Writing and Submitting a Research Project	The Course aims to develop the Trainees' ability to submit a grant proposal starting from the design of the protocol to the preparation of the forms. The course is divided into a more theoretical part in which the methodological tools are provided and a part of writing a proposal by each student that is then collegially analysed and reviewed.	20	X
	Not-mandatory Courses			



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Prof. Perata	How to publish in international science journals	The course will address the following questions, all crucial to increase the chances to publish scientific results in scientific journals. Why publishing in International Journals? Which is the BEST Journal? The ISI database, The Impact Factor, Journal Immediacy Index, Journal Cited Half-Life. Beyond the IF: is the IF a satisfactory index of research quality? The ESI (Essential Science Indicators) database How to publish in international Journals: choosing the right Journal for your research, choosing the research subject to publish in the desired Journal. Writing: how to write a good manuscript, from the Abstract to the References list. Authorship: who deserves being an author of your manuscript? The Peer Reviewing process: Editors, Referees, Authors. How to exclude a referee, how to suggest a referee. How to be a good referee. Research ethics: the importance of controls in experimental design, the importance of data analysis, fraudulent or manipulated data, paper retractions	10	no
Dr. Neglia	Imaging techniques in biomedical research: from cells to humans	The present Course has the ambition to connect scientists and their techniques, ranging from cellular imaging at a molecular level, via small animal imaging, to human imaging, to clinicians or students interested in getting the knowledge required for understanding and choosing imaging and non-imaging tools in cardiovascular research and clinical practice.	12	no
Prof. Piccaluga, Prof. Di Minin	High-Tech Entrepreneurship (basic)	This course is designed to introduce participants, mainly PhD students from different disciplines (STEM but also Social Sciences and Humanities) and also young researchers and post-docs, to the basic knowledge and competences about high-tech entrepreneurship. More precisely, the course will provide participants with the basic understanding of the role, analytics and process of business planning that lead to the creation of new innovative business ventures, especially regarding those which are generated within an academic environment, on the basis of public research.	10	no
Prof. Lionetti	Fundamentals in Edible Epigenetics	In the fundamentals in edible epigenetics, the PhD student will learn the basic principles of nutrigenomics applied to nutraceuticals and ristoceutics. The present course will provide a solid foundation in critical thinking, evidence-based knowledge and multidisciplinary competence skills as prerequisites for providing extensive personalized sustainable nutrition in all settings of primary, secondary and tertiary prevention. At the end of the course, the student will be asked to set up a new functional meal considering associations between functional foods and cooking techniques.	10	no



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Prof. Lionetti	Medical Management of the Surgical Patient	The Course will provide to PhD student evidence-based knowledge and case -based reasoning on the preoperative, perioperative, and post-operative medical care of surgical patients. Each lesson will highlight a particular area of clinical concern, with concise presentations of pathophysiology, assessment and management options, the latest drug treatment information, and essential information on risk stratification and quality improvement. The main goal is providing the key elements for the best management of surgical patients with co-existing medical problems that may be affected by surgery, as well as how to approach medical complications that may occur during or following surgical procedures.	20	no
Prof. Lionetti	Advances in Repair and Tissue Engineering	Repair and tissue engineering techniques have evolved in the latest years: the PhD student will learn on the research strategies to repair, replace, regenerate and ultimately rejuvenate various tissues and organs to solve major clinical problems. The student will gain a comprehensive insight into up-to-date issues such as stem cells (including niche and exosomes), design and characterization of biomaterials and nanomaterials, biofabrication (including 3D bioprinting), cell and gene therapies, animal models, commercialization and clinical translation of regenerative therapies. The course will prepare for a career in pharmaceutical, biotechnology and regenerative medicine sectors	16	no
Prof.ssa Angeloni	Space biology for human health	The course offers an overview of specific topics of experimental biology and biomedicine in support of human exploration of space, considering their direct and indirect relevance for ground applications. With the dawn of commercial access and exploitation of space, the major space agencies including the Italian Space Agency and the European Space Agency are planning, with industrial support and investments, outposts for human crews to live and work in space. This course represents a unique opportunity to learn about how space exploration has provided experimental biology a new and unprecedented way to study life, and also highlights the most compelling issues for permitting safe and productive inhabiting of space. The course is organized in frontal lectures and includes multidisciplinary seminars offered by Academia, space agency and industry lecturers. Topics include gravitational biology, with reference to molecular and cell biology for microgravity and hyper gravity; physiology and chronobiology in extreme environments; ground simulations of microgravity; hibernation for long duration missions; a broad overview of life support systems	20	no



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Prof. Lionetti	Anesthesia methods and monitoring of experimental models	The goal of the course is to impart the knowledge required to understand the experimental approaches used in basic and translational research based on the use of small and large animal models. Theoretical and practical aspects of laboratory animals will be tasked. The Course will highlight how to handle and anesthetize laboratory animals and which criteria are typically followed in the monitoring of organ function. The Course will provide a practical approach to pharmacology with the goal of learning how to design and validate experimental protocol and to comparative physiology with the goal of choosing the more appropriate naturally occurring or induced animal model of human disease.	20	no
Prof.ssa Nuti, Prof.ssa Vainieri	Health care management in public health systems	The course aims at providing PhD students with the fundamental components of health care management. In particular, the course will introduce students with the main features of the health care systems (the mission, the actors and their relationships), then it will introduce the main issues related to the barriers and facilitators of the innovation in health care. The course is arranged mixing lectures with project works and case studies. Lectures will include theoretical issues in health service research.	20	no
Prof.ssa Ferrè	Principles of behavioral science in healthcare management	The course "Principles of behavioural science in healthcare management" aims at providing students with a comprehensive overview of behavioural and experimental research in healthcare management, broadly defined. More precisely, we will explore the micro-level perspective of individual behaviour and attitudes by drawing on insights from across the behavioural sciences – including management, economics, public policy, and psychology. The course provides basic elements to understand the principles of behavioural science applied to the healthcare context. Case study and evidence from the field will be discussed in class.	10	no
Prof Di Donato	The Web as a Research Environment	The course provides basic knowledge on the characteristics and use of R statistical package. R is an open-source program used for statistical analysis and graphic restitution of experimental data. More specifically, this course is meant to be an introduction to the use of the R. The course arguments will be: 1) R and R-Studio installation procedure; 2) basic commands and explanation to make "scripts" of commands; 3) objects in R (vectors, dataframes) and basic operations; 4) data from external files (txt, xlsx, csv); 5) functions for the creation of graphics	10	no



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P. Tonutti	Principles of Perishable Fruit Production and Storage	The course will provide students with the basic knowledge of the techniques and protocols for the production of the main perishable temperate fruit crops (apples, pears, grapes, olives, peaches). The botanical features and the ecological and environmental requirements for a successful cultivation will be illustrated. The reproductive biology of each species will be described as well as the factor affecting fruit growth and development, including ripening. The quality parameters at harvest will be defined and the pre-harvest and post-harvest factors affecting external appearance and internal composition will be analysed. The last part of the course will be devoted to the description of the main protocols applied to store perishable fruits and the effects of applying refrigeration and other tools (ethylene inhibitors, low oxygen) on the evolution of ripening and the subsequent shelf- and commercial-life	20	no
	Seminars and other activities			
Invited speakers	Disciplinary seminars		10	
Invited speakers	Inter- Trans-disciplinary seminars		10	
Invited speakers	Workshop		8	