Course unit English denomination	**From idea to funding: project design and opportunities for health research**
SS	**SPS/04**
Teacher in charge (if defined)	Dr. Francesca Cassaro
Teaching Hours	6 h
Number of ECTS credits allocated	1
Course period	21, 26, 28 January 2027
Course delivery method	☒ In presence ☐ Remotely ☐ Blended
Language of instruction	Italian (English if required)
Mandatory attendance	☐ Yes ☐ No
Course unit contents	*Session 1 — From problem to project* • The logical framework: from problem to solution • The project life cycle • Innovation projects within multilevel policy frameworks (public and private) • Budgeting and reporting principles *Session 2 — Funding opportunities* • Types of calls: individual and collaborative grants • How to read a call for proposals (call anatomy) • Main European funding programmes (Horizon Europe, EU4Health...) • Funded projects databases • How to find partners: ERNs and knowledge partnerships • The role of the university research office
Learning goals	By the end of the course, PhD students will be able to: • Build the logical framework of a research project • Place a project within the European multilevel policy context • Identify the most suitable funding opportunities for their research profile • Read and interpret a European call for proposals • Use the main databases and tools to search for partners
Teaching methods	• Lectures

	• Case study analysis • Hands-on exercises on real calls
Course on transversal, interdisciplinary, transdisciplinary skills	☒ Yes ☐ No
Available for PhD students from other courses	☒ Yes ☐ No
Prerequisites (not mandatory)	None
Examination methods (if applicable)	
Suggested readings	
Additional information	The course is particularly recommended for PhD students interested in developing European project design skills and accessing competitive funding for health research.

Course unit English denomination	**Omics and Basic Sciences**
SS	MEDS-01/A, CHEM-07/A, BIOS-10/A
Teacher in charge (if defined)	Prof. Matteo Cassina, Prof. Giampietro Viola, Prof.ssa Michela Pozzobon
Teaching Hours	6
Number of ECTS credits allocated	1
Course period	11, 18 mar e 1 apr 2027
Course delivery method	☒ In presence ☐ Remotely ☐ Blended
Language of instruction	English
Mandatory attendance	☒ Yes (80% minimum of presence) ☐ No
Course unit contents	The course will introduce PhD students to the emerging field of omics sciences, particularly genomics.. The course will provide an overview of omics technologies, data analysis methods, and their applications in biological and medical research. In addition, fundamental concepts in biology and other disciplines will be covered, focusing on those relevant to the development, progression, and treatment of cancer and genetic diseases
Learning goals	- To learn principles, history, and technologies of omics sciences. - To provide an understanding of omics data generation and analysis (second and third-generation sequencing technologies; genome annotation and analysis; DNA microarray)

	- To explore the applications of omics technologies in basic research, clinical diagnostics, and personalized medicine. - To explore basic principles of biology, genetics, pharmacology, and regenerative medicine relevant to cancer and genetic diseases. - To learn examples of basic approaches for developing innovative treatments of pediatric oncological and genetic diseases.
Teaching methods	Series of seminar with slides
Course on transversal, interdisciplinary, transdisciplinary skills	☐ Yes ☒ No
Available for PhD students from other courses	☐ Yes ☒ No

Course unit English denomination	**Practical approaches and bioinformatic tools in omics data analysis**
SS	MEDS-20/A
Teacher in charge (if defined)	• Dr. Carlo Zanon, Istituto di Ricerca Pediatrica Città della Speranza • Prof. Lara Mussolin, UNIPD
Teaching Hours	6
Number of ECTS credits allocated	1
Course period	24/02, 03, 10/03
Course delivery method	☒ In presence ☐ Remotely ☐ Blended
Language of instruction	English
Mandatory attendance	☒ Yes (80% minimum of presence) ☐ No
Course unit contents	The course will represent a synopsis on different omics data types commonly used in biomedical research and then focusing on practical aspects of their analyses. Given the ever developing field of bioinformatics, a detailed introductory overview will be conveyed on different data types (microarray, NGS bulk and single-cell, 3D protein visualization), data structures (NGS fastq and bam files, Seurat objects) along with the underlying data production technologies (NGS platforms). This will set the bases to better undestand the downstream analytical approaches and tools (Bash, R and Python languages, online databases and softwares, bioinformatic pipelines) and the related informatic structural requirements in order to reach the optimal results interpretation. Lectures will be practically oriented with a theoretical background followed by examples and hints mainly based on online resources and tools with the aim of allowing the students for a jump start in basic analyses of omics data.
Learning goals	The course will represent a synopsis on different omics data types commonly used in biomedical research and then focusing on practical aspects of their analyses. Given the ever developing field of bioinformatics, a detailed introductory overview will be conveyed on different data types (microarray, NGS bulk and single-cell, 3D protein visualization), data structures (NGS fastq and bam files, Seurat objects) along with the underlying data production technologies (NGS platforms). This will set the bases to better undestand the

	downstream analytical approaches and tools (Bash, R and Python languages, online databases and softwares, bioinformatic pipelines) and the related informatic structural requirements in order to reach the optimal results interpretation. Lectures will be practically oriented with a theoretical background followed by examples and hints mainly based on online resources and tools with the aim of allowing the students for a jump start in basic analyses of omics data.
Teaching methods	Seminar featuring practical demonstrations
Course on transversal, interdisciplinary, transdisciplinary skills	☒ Yes ☐ No
Available for PhD students from other courses	☐ Yes ☒ No
Prerequisites (not mandatory)	None
Examination methods (if applicable)	No
Suggested readings	
Additional information	

Course unit English denomination	**Grant Writing**
SS	ND
Teacher in charge	Martina Pigazzi
Teaching Hours	6
Number of ECTS credits allocated	1
Course period	12, 19 November 2026
Course delivery method	☒ In presence ☐ Remotely ☐ Blended
Language of instruction	Italian
Mandatory attendance	☒ Yes (% minimum of presence) ☐ No
Course unit contents	The course will outline the key steps involved in writing a scientific project, from identifying the most suitable call for proposals to drafting the full application. It will cover how to structure all sections of a proposal—from the introduction and objectives to the expected results—focusing on the narrative and scientific strategies that make a proposal clear, coherent, and persuasive. The practical computer-based session will involve searching for funding opportunities using platforms such as the Funding & Tenders Portal and EURAXESS. Participants will learn how to apply filters based on disciplinary area and career stage, select a relevant call, and carry out a guided analysis of its objectives and eligibility criteria. A final discussion session will allow participants to share their findings and engage in peer comparison and feedback.

Learning goals	• Understand the different types of grants available. • Learn how to select the most suitable grant opportunities based on your organization and your research. • elucidate the key components of a grant proposal. • Distinguish Background from state of the art. • Learn to identify the hypothesis from the objectives.
	• Acquire the ability to write a compelling grant narrative and avoid common mistakes. • Identify and understand the various % of a grant budget. • identify human resources. • Learn how to justify the budget. • Distinguish between letters of support and letters of collaboration. • Learn how to develop the feasibility paragraph. • How to use and construct preliminary data. • Develop and extrapolate the impact of the grant in the field. • List and summarize expected results. • Develop pitfalls and caveats to sustain a contingency plan. • Delineate your narrative biographical sketch. • Understanding the selection process**:** assessing personal eligibility and identifying potential gaps • Interpreting evaluation criteria: how to read between the lines of assessment requirements • Mini project exercise: aligning a project idea with the selected
Teaching methods	Seminar with slides + practical section at PC
Course on transversal, interdisciplinary, transdisciplinary skills	☒ Yes ☐ No

Available for PhD students from other courses	☐ Yes ☒ No
Prerequisites (not mandatory)	None
Examination methods (in applicable)	No
Suggested readings	
Additional information	Transversal course not attributable to any specific SS.

Course unit English denomination	**Use of bibliographic resources**
SS	ND
Teacher in charge (if defined)	M. Cassina
Teaching Hours	4
Number of ECTS credits allocated	0.66
Course period	12, 14, 19 January 2027
Course delivery method	☒ In presence ☐ Remotely ☐ Blended
Language of instruction	Italian
Mandatory attendance	☒ Yes (80 % minimum of presence) ☐ No

Course unit contents	First lesson - digital magazines and ebooks - supply of documents - PubMed - Zotero Second lesson - the Scopus and Web of Science citation databases - Journal of Citation Reports - bibliometric indicators - Open Science - Institutional archives
Learning goals	• Know the resources to support research made available by the Pinali Library • Learn to use the programs available • Increase your ability to carry out bibliographic searches and find useful resources for research • Understand how bibliometric indicators work
Teaching methods	Seminar with slides support
Course on transversal, interdisciplinary, transdisciplinary skills	☒ Yes ☐ No
Available for PhD students from other courses	☐ Yes ☒ No
Prerequisites (not mandatory)	None

Course unit English denomination	**Fetal Medicine: A Translational Perspective from Intrauterine Life to Postnatal Outcomes**
SS	
Teacher in charge (if defined)	Prof.ssa Silvia Visentin
Teaching Hours	1 h
Number of ECTS credits allocated	
Course period	15 April 2027
Course delivery method	☐ In presence ☐ Remotely ☒ Blended
Language of instruction	Italian/English
Mandatory attendance	☐ Yes ☐ No
Course unit contents	See below
Learning goals	Principles of fetal medicine
Teaching methods	Oral presentation
Course on transversal, interdisciplinary, transdisciplinary skills	☒ Yes ☐ No
Available for PhD students from other courses	☒ Yes ☐ No
Prerequisites (not mandatory)	
Examination methods (if applicable)	
Suggested readings	
Additional information	

Seminar contents

Fetal medicine has progressively evolved from a predominantly diagnostic discipline into a dynamic and translational field in which the fetus is recognized as an active patient, embedded within a complex maternal–placental–fetal unit. Advances in imaging, molecular biology, and prenatal diagnostics have enabled increasingly precise characterization of fetal development, allowing clinicians and researchers to investigate not only structural anomalies but also functional and metabolic adaptations occurring in utero.

This seminar aims to explore fetal medicine as a model of translational medicine, where observations at the fetal level can inform mechanisms of disease, guide clinical decision-making, and influence outcomes beyond birth. Particular attention will be given to the integration of prenatal diagnostic tools—such as ultrasound, Doppler velocimetry, and emerging omics approaches—with clinical phenotypes, highlighting how early alterations in growth, vascular function, and metabolism may reflect adaptive responses to intrauterine conditions.

By bridging basic science and clinical practice, fetal medicine provides a unique opportunity to study the early origins of disease processes and to identify biomarkers and targets for intervention. Conditions such as impaired fetal growth, placental dysfunction, and hypertensive disorders of pregnancy will be discussed as paradigmatic examples in which prenatal findings may anticipate postnatal trajectories, including cardiovascular and metabolic implications.

Ultimately, this perspective underscores the relevance of fetal life as a critical window for investigation and intervention, emphasizing the need for a multidisciplinary and longitudinal approach that extends from prenatal assessment to postnatal follow-up. In this context, fetal medicine represents not only a subspecialty of obstetrics but also a platform for advancing translational research with meaningful clinical impact across the life course.

Course unit English denomination	**Fetal Programming: From Developmental Adaptation to Translational Research Pathways**
SS	
Teacher in charge (if defined)	Prof.ssa Silvia Visentin
Teaching Hours	1 h
Number of ECTS credits allocated	
Course period	22 April 2027
Course delivery method	☐ In presence ☐ Remotely ☒ Blended
Language of instruction	Italian/English
Mandatory attendance	☐ Yes ☐ No
Course unit contents	See below
Learning goals	
Teaching methods	Oral presentation
Course on transversal, interdisciplinary, transdisciplinary skills	☒ Yes ☐ No
Available for PhD students from other courses	☒ Yes ☐ No
Prerequisites (not mandatory)	
Examination methods (if applicable)	
Suggested readings	
Additional information	

Seminar contents

Building on the clinical and diagnostic framework outlined in fetal medicine, this seminar shifts the focus toward the mechanistic underpinnings of how intrauterine conditions shape long-term health. Fetal programming describes the set of biological processes through which environmental exposures during critical phases of development induce persistent changes in organ structure, function, and regulatory pathways. These changes should not be interpreted as passive consequences of adverse conditions, but rather as dynamic and context-dependent adaptations that may influence susceptibility to disease later in life.

The seminar will explore the mechanistic basis of these processes, with particular emphasis on how alterations in placental function, nutrient signaling, and fetal hemodynamics converge to shape developmental trajectories. Evidence from clinical and experimental studies will be discussed to illustrate how early modifications in vascular reactivity, renal development, and metabolic regulation emerge in response to intrauterine stressors. Particular attention will be given to the integration of phenotypic observations with molecular insights, including metabolomic and biomarker-based approaches, which enable the identification of early signatures of these adaptive responses.

A central aspect of this field lies in its translational dimension. The characterization of fetal programming mechanisms allows the identification of measurable indicators during fetal life or at birth that may predict postnatal outcomes. This opens the possibility of early risk stratification, refinement of surveillance strategies, and the development of targeted interventions aimed at modifying disease trajectories before clinical manifestation. In this context, conditions such as impaired fetal growth and hypertensive disorders of pregnancy represent clinically relevant models in which mechanistic insights can be directly translated into patient-oriented applications.

By bridging developmental biology, clinical research, and emerging technologies, fetal programming represents a paradigm through which early-life data can be translated into actionable knowledge, supporting a shift toward a more anticipatory and preventive model of medicine.