COURSE DETAILS

" INTEGRATED COURSE OF LABORATORY MEDICINE"

SSD BIO/12, MED/05, MED/07, MED/46 *

DEGREE PROGRAMME: MEDICINE AND SURGERY (P11)
COORDINATOR: PROF. PAOLA SALVATORE
ACADEMIC YEAR 2025-2026.

GENERAL INFORMATION – TEACHER REFERENCES

TEACHER: PROF. PAOLA SALVATORE
PHONE: 081/7464218/2058
EMAIL: PAOLA.SALVATORE@UNINA.IT

Faculty	Position	Scientific Fields:	Phone	Reception	E-mail
Beguinot Francesco	Full Professor	Clinical Pathology	3248	Friday 13:00-15:00	francesco.beguinot@unina.it
Formisano Pietro	Full Professor	Clinical Pathology	4450	Tuesday 15:00-17:00	fpietro@unina.it
Fortunato Giuliana	Full Professor	Clin.Bioch.Clin.Mol.Biol.	4200	Tuesday 10:00-12:00	giuliana.fortunato@unina.it
Frisso Giulia	Full Professor	Tec.Sc.Lab. Med	2405	Friday 12:00-13:00	giulia.frisso@unina.it
La Cava Antonio	Full Professor	Tec.Sc.Lab. Med			alacava@mednet.ucla.edu
Pastore Lucio	Full Professor	Clin.Bioch.Clin.Mol.Biol.	7185	Monday 15:00-17:00	lucio.pastore@unina.it
Portella Giuseppe	Full Professor	Clinical Pathology	3052	Thursday 10:00-13:00	giuseppe.portella@unina.it
Salvatore Paola	Full Professor	Clinical Microbiology	2058	Friday 15:00-17:00	psalvato@unina.it
Colicchio Roberta	Associate Professor	Clinical Microbiology	2058	Friday 12:00-13:00	roberta.colicchio@unina.it
Di Taranto M Donata	Associate Professor	Clin.Bioch.Clin.Mol.Biol.	3530	Thursday 12:00-13:00	mariadonata.ditaranto@unina.it
Loffredo Stefania	Associate Professor	Clinical Pathology	3248	Monday 14:00-16:00	stefania.loffredo2@unina.it
Lombardo Barbara	Associate Professor	Clin.Bioch.Clin.Mol.Biol	3737817	Monday 11:00-12:00	barbara.lombardo@unina.it
Nardelli Carmela	Associate Professor	Clin.Bioch.Clin.Mol.Biol	3737930	Monday 12:00-14:00	carmela.nardelli@unina.it
Pagliuca Chiara	Associate Professor	Clinical Microbiology	2058	Thursday 14:00-16:00	chiara.pagliuca@unina.it

GENERAL INFORMATION ABOUT THE COURSE

INTEGRATED COURSE: INTEGRATED COURSE OF LABORATORY MEDICINE
TEACHING LANGUAGE: ENGLISH
YEAR OF THE DEGREE PROGRAMME: III
SEMESTER: II
CFU: 9

REQUIRED PRELIMINARY COURSES (IF MENTIONED IN THE COURSE STRUCTURE "REGOLAMENTO"

Molecular and Cellular Biology, Human Biochemistry

PREREQUISITES

- The student must know the biochemical and molecular mechanisms that govern the metabolic-functional integration between various organs and tissues. Must know and be able to apply the general laws that regulate the transmission of hereditary characters; identify in human the inheritance of the normal and pathological characters, be able to determine the mode of transmission and evaluate the probability of occurrence in offspring and learn about the progress of molecular genetics for the impact that can have on the life and well-being of patients.
- Must know the functioning and the control mechanisms of the human organs, based on the knowledge of the cellular metabolic activity of each organ, to arrive at the integration of the different organs in apparatus or systems in physiological conditions.
- The student must have knowledge about the causes and mechanisms as well as the functional alterations of the main diseases: neoplastic, metabolic and of endocrine system, blood diseases, diseases of the main organs and systems, as well as possessing the cognitive tools for the nosological framing and for the understanding of etiopathogenesis of such diseases.
- Finally, the student must know the general principles underlying the classical and innovative methodologies used for the study of laboratory parameters, even at the gene level, as well as the main statistical notions for the evaluation of laboratory investigations.

LEARNING GOALS

The course aims to provide students with basic knowledge *on* clinical/diagnostic values through use of laboratory tests, suggesting clinical decisions that derive directly or indirectly from the critical evaluation of the same ones used individually or in an integrated way also with other laboratory and instrumental investigations.

EXPECTED LEARNING OUTCOMES (DUBLIN DESCRIPTORS)

Knowledge and understanding

The student must demonstrate knowledge and ability to understand the laboratory findings associated with the main pathologies to establish adequate clinical reasoning as well as direct any diagnostic investigations. The student must recognize and study the most important indicators and methodologies that underlie the main pathologies including metabolic, inflammatory and genetic, hereditary and acquired diseases. This knowledge will allow the student to recognize the clinical value of the main biochemical and molecular markers in relation to their use in the diagnostic, prognostic or therapeutic monitoring phase.

Applying knowledge and understanding

At the end of the course, students are expected to be able to:

- Indicate the most suitable laboratory tests for pregnancy monitoring, for the diagnosis and follow-up of genetic and metabolic diseases and to interpret the results in terms of diagnostic predictivity.
- Know the resident microbial population in the main body districts and pathogenic microorganisms most frequently found in infectious processes of physiologically sterile districts.
- Recognize the laboratory clinical picture associated with the main diseases of the blood, gastrointestinal tract (liver, pancreas), heart, kidney, heart and skeletal muscle, endocrine system, nervous system, bone, to set a proper clinical reasoning as well to address any diagnostic investigations.
- Identify and study the most important indicators and methodologies that are the basis of inherited and acquired genetic diseases (clinical molecular biology and molecular diagnostics for the prevention, diagnosis and monitoring of the same).
- Know the clinical value of the main neoplastic indicators (biochemical, cytological, biomolecular) in relation to their use in the diagnostic, prognostic or therapeutic monitoring phase and the use of recombinant DNA.

COURSE CONTENT/SYLLABUS

- The clinical reasoning in the choice of laboratory investigations and sources of variability in data production
- Tools, even statistical, for a correct interpretation of diagnostic laboratory tests and the requirements of a standard medical report
- Biochemical-clinical investigations for the study and monitoring of changes in glucose metabolism
- Meaning of the alterations of the main proteins (serum, liquor etc.) and the associated pathological pictures
- Biochemical and molecular biology investigations for the study of alterations in lipid metabolism and other biochemical-genetic risk factors for atherosclerosis; the metabolic syndrome; gene therapy for atherosclerosis
- Main proteins for the study of the heart muscle alterations
- Investigations of clinical molecular biology in the diagnosis of neuromuscular diseases and other hereditary genetic diseases; clinical genomics
- Laboratory investigations to evaluate the functional/structural integrity of the liver and pancreas. Laboratory diagnostics of malabsorption
- Laboratory investigations to evaluate the functional/structural integrity of the kidney
- Investigations of clinical molecular biology in the study of acquired genetic diseases, in oncological hematology, as well as in the individual genetic characterization
- Main diagnostic tests in endocrinopathies
- Laboratory diagnostics in alterations of calcium-phosphorus metabolism
- Laboratory investigations in monitoring pregnancy
- The use of tumor markers in cancer diagnostics
- Hepatitis markers and their diagnostic and prognostic significance
- Laboratory diagnostics of HIV infections
- Laboratory diagnostics in allergic and autoimmune diseases
- Laboratory investigations in metabolic diseases
- Laboratory investigations in the complications of diabetic disease
- Diagnostic investigations in diseases affecting red blood cells and leukocytes
- The main tests for hemorrhagic and thrombotic diseases
- Laboratory diagnostics for the evaluation of surface markers (erythrocytes, leukocytes, stem cells, platelets and for antibody detection).
- Collection of stem cells and their possible use
- Laboratory investigations for the evaluation of pre-transplant compatibility
- Organization of Clinical Microbiology Laboratory, several diagnostic approaches and consequent analytical strategies: cultural, serological and molecular diagnostics
- General principles of bacteriology and chemo-antibiotic-sensitivity "*in vitro*" techniques; serum immunological techniques; miniaturized techniques, rapid methods and semi-automation
- Indications, methods and timing of the sampling, notions on the analytical procedure, interpretation of the medical report in the infections of the: i. Genitourinary tract; ii. Genital tract; iii. Respiratory system iv. Nervous system; v. Gastrointestinal tract and Systemic infections.

SCHEDULE OF THE INTEGRATED COURSE

Week	Day	hour	Professor	Formal lecture
1 March 9th- 13th, 2026	Tue 10	14.00- 15.00 15.00- 16.00 16:00-17:00	M.D. di Taranto	**Clinical Biochemistry:** Introduction of principles of laboratory medicine analysis: specimen collection and other pre-analytical variables **Clinical Biochemistry:** Establishment and use of reference values Interpretation of laboratory tests: specificity, sensitivity and predictive value of test
	Wed 11	15.00- 16.00 16.00-17.00	L. Pastore	**Clinical Biochemistry:** Molecular biology investigations for the diagnosis of hereditary genetic diseases **Clinical Biochemistry:** Therapeutic applications to clinical molecular biology.
	Thu 12	14.00- 15.00 15.00-16.00 16.00-17.00	G. Fortunato	**Clinical Biochemistry:** Biochemical-clinical and genetic investigations aimed at studying and monitoring the alterations of lipid metabolism **Clinical Biochemistry:** Discussion of clinical cases
2 March 16th – 20th, 2026	Tue 17	14.00- 15.00 15.00- 16.00 16:00-17:00	G. Fortunato C. Nardelli	**Clinical Biochemistry:** Laboratory investigations aimed at assessing the functional/structural integrity of the *myocardium* **Clinical Biochemistry:** Discussion of clinical cases **Clinical Biochemistry:** Biochemical-clinical and genetic investigations aimed at studying and monitoring the alterations of glucose metabolism **Clinical Biochemistry:** Discussion of clinical cases
	Wed 18	15.00- 16.00 16.00-17.00	G. Frisso	**Clinical Biochemistry:** Molecular biology investigations for the diagnosis of *hereditary cardiomyopathies*
	Thu 19	14.00- 15.00 15.00- 16.00 16.00-17.00	M.D. di Taranto L. Pastore	**Clinical Biochemistry:** Laboratory investigations aimed at assessing the functional/structural integrity of the bone**.** **Clinical Biochemistry:** Molecular biology investigations for the diagnosis of *expansion of triplet diseases* **Clinical Biochemistry:** discussion of clinical cases
3 March 23rd –27th, 2026	Tue 24	14.00- 15.00 15.00-16.00 16.00-17.00	C. Pagliuca	**Clinical Microbiology:** Organization of Clinical Microbiology Laboratory **Clinical Microbiology:** Different diagnostic approaches and consequent analytical strategies: bacteriological, serological and molecular diagnostics **Clinical Microbiology:** General principles of bacteriology
	Wed 25	15.00- 16.00 16.00-17.00	C. Nardelli	**Clinical Biochemistry:** Laboratory evaluation of the major coagulation diseases.
	Thu 26	14.00- 15.00 15.00- 16.00 16.00-17.00	C. Pagliuca	**Clinical Microbiology:** Chemo-antibiotic-sensitivity "*in vitro*" techniques **Clinical Microbiology:** Serum immunological techniques; miniaturized techniques, rapid methods and semi-automation techniques
4 March - April 30th –3rd, 2026	Tue 31	14.00- 15.00 15.00-16.00 16.00-17.00	C. Pagliuca	**Clinical Microbiology:** Indications, methods and timing of sampling, notions on the analytical procedure, interpretation of the medical report in infections of the urinary tract. **Clinical Microbiology:** infections of the urinary tract: discussion of clinical cases. **Clinical Microbiology:** Indications, methods and timing of sampling, notions on the analytical procedure, interpretation of the medical report in infections of the nervous system.

	Wed 1	15.00- 16.00 16.00-17.00	C. Pagliuca	**Clinical Microbiology:** Indications, methods and times of sampling, notions on the analytical procedure, interpretation of the medical report in respiratory infections. Discussion of clinical cases.
	Thu 02	14.00- 15.00 15.00- 16.00 16.00-17.00	Holiday	Holiday
5 April 6th- 10th, 2026	Tue 07	14.00- 15.00 15.00- 16.00 16.00- 17.00	Holiday	Holiday
	Wed 08	15.00- 16.00 16.00-17.00	R. Colicchio	**Clinical Microbiology:** The microbiological diagnostics of Spirochetes, the *Treponema genus* **Clinical Microbiology:** Discussion of clinical cases
	Thu 09	14.00- 15.00 15.00-16.00 16.00-17.00	R. Colicchio	**Clinical Microbiology:** Indications, methods and timing of sampling, notions on the analytical procedure, interpretation of the medical report in sexually transmitted infections. **Clinical Microbiology:** Discussion of clinical cases.
6 April 13rd -17th, 2026	Tue 14	14:00-15:00 15:00-16:00 16.00-17.00	A. La Cava	**Clinical Biochemistry:** Laboratory investigations aimed at assessing the functional/structural integrity of the liver and meaning of the alterations concerning the main plasma proteins and related diseases **Clinical Biochemistry:** Discussion of clinical cases
	Wed 15	15.00- 16.00 16.00- 17.00	A. La Cava	**Clinical Biochemistry:** Laboratory investigations aimed at assessing the functional/structural integrity of the pancreas **Clinical Biochemistry:** Discussion of clinical cases
	Thu 16	14.00- 15.00 15.00-16.00 16.00-17.00	A. La Cava	**Clinical Biochemistry:** Laboratory investigations aimed at assessing the functional/structural integrity of the kidney **Clinical Biochemistry:** Discussion of clinical cases
7 April 20th – 24th, 2026	Tue 21	14:00-15:00 15:00-16:00 16.00-17.00	A. La Cava	**Clinical Biochemistry:** Laboratory investigations aimed at assessing electrolytes and acid-base balance. **Clinical Biochemistry:** Discussion of clinical cases
	Wed 22	15.00- 16.00 16.00- 17.00	A. La Cava	**Clinical Biochemistry:** Blood count under normal conditions or in the presence of the major red blood cell disorders **Clinical Biochemistry:** Discussion of clinical cases
	Thu 23	14.00- 15.00 15.00-16.00 16.00-17.00	P. Formisano A. La Cava	**Clinical Pathology:** Basic Principles of Laboratory Diagnostics in Endocrine Diseases **Clinical Biochemistry:** Flow cytometry diagnosis in the presence of the major hemato-oncological disease **Clinical Biochemistry:** Discussion of clinical cases
8 April 27th - May 1st, 2026	Tue 28	14.00- 15.00 15.00- 16.00 16.00-17.00	P. Formisano P. Salvatore	**Clinical Pathology:** Laboratory diagnostics of thyroid diseases **Clinical Microbiology:** Microbiological diagnosis of mycobacterial infection **Clinical Microbiology:** Microbiological diagnostics of mycobacteria: *Mycobacterium tuberculosis*, discussion of clinical cases
	Wed 29	15.00- 16.00 16.00- 17.00	P. Salvatore C. Pagliuca	**Clinical Microbiology:** Microbiological diagnostics of mycobacteria: *Mycobacterium leprae.* **Clinical Microbiology:** Discussion of clinical cases of nervous system infection.
	Thu 30	14.00- 15.00	C. Pagliuca	**Clinical Microbiology:** Indications, methods and timing of sampling, notions on the analytical procedure, interpretation of the medical report in sepsis.

		15.00- 16.00 16.00-17.00	F. Beguinot	**Clinical Pathology:** Basic Principles of Laboratory Diagnostics in Metabolic Diseases; **Lab Medicine technologies:** Practical examples and discussion of clinical cases of metabolic disorders.
9 May 4th–8th, 2026	Tue 5	14.00- 15.00 15.00- 16.00 16.00-17.00	C. Pagliuca F. Beguinot	**Clinical Microbiology:** Discussion of clinical cases of systemic infections. **Clinical Pathology:** Classification of type 2 Diabetes Mellitus
	Wed 6	15.00- 16.00 16.00-17.00	P. Formisano	**Clinical Pathology:** Laboratory diagnostics in hormone resistance **Lab Medicine technologies:** Practical examples and discussion of clinical cases of receptor pathologies
	Thu 7	14.00- 15.00 15.00- 16.00 16.00-17.00	G. Fortunato	**Lab Medicine technologies:** different types of blood sampling (venous sampling with practical exercise, capillary sampling for the monitoring of the diabetic patient, the collection of cord blood for the collection of stem cells) **Lab Medicine technologies:** the analysis of urine (chemical-physical and sediment with microscopic reading) and interpretation of reports **Lab Medicine technologies:** Discussion and interpretation of clinical biochemistry reports
10 May 11th - 15th, 2026	Tue 12	14.00- 15.00 15.00- 16.00 16.00-17.00	F. Beguinot P. Formisano	**Clinical Pathology:** Laboratory Diagnostics of the different types of Diabetes **Lab Medicine technologies:** Practical examples and discussion of clinical cases of endocrine disorders
	Wed 13	15.00- 16.00 16.00-17.00	P. Salvatore	**Clinical Microbiology:** Discussion of clinical cases of mycobacteria infections.
	Thu 14	14.00- 15.00 15.00- 16.00 16.00-17.00	S. Loffredo	**Clinical Pathology:** Laboratory diagnostics of allergic diseases. **Clinical Pathology:** Laboratory diagnostics of Angioedema. **Clinical Pathology:** Laboratory diagnostics of autoimmune diseases.
11 May 18th– 22nd, 2026	Tue 19	14.00- 15.00 15.00- 16.00 16.00-17.00	G. Portella P. Formisano	**Clinical Pathology:** Laboratory Diagnostics of Viral Hepatitis 1. **Clinical Pathology:** Practical examples and discussion of clinical.
	Wed 20	15.00- 16.00 16.00-17.00	S. Loffredo F. Beguinot	**Lab Medicine technologies:** Discussion of clinical cases of allergic disorders. **Clinical Pathology:** Laboratory Diagnostics of Diabetic Complications
	Thu 21	14.00- 15.00 15.00- 16.00 16.00-17.00	S. Loffredo G. Portella	**Clinical Pathology:** Laboratory diagnostics of autoimmune diseases **Clinical Pathology:** Laboratory diagnostics of abnormal level of immune cells (mastocytosis, neutropenia, ipereosinophilia). **Clinical Pathology:** Laboratory Diagnostics of Viral Hepatitis 2
12 May 25th –29th, 2026	Tue 26	14.00- 15.00 15.00- 16.00 16.00-17.00	G. Portella	**Clinical Pathology:** Laboratory diagnostics of HIV infections **Clinical Pathology:** Laboratory diagnostics of herpetic infections, particularly in transplanted patients
	Wed 27	15.00- 16.00 16.00- 17.00	F. Beguinot G. Portella	**Clinical Pathology:** Predicting onset and prognosis of common metabolic diseases. Hints from Epigenetics and Pharmacogenomics **Clinical Pathology:** Molecular markers in neoplastic disorders 1
	Thu 28	14.00- 15.00 15.00- 16.00	P. Formisano G. Portella	**Lab Medicine technologies:** Practical examples and discussion of clinical cases of transfusion medicine **Clinical Pathology:** Molecular markers in neoplastic disorders 2

		16.00-17.00	S. Loffredo	**Lab Medicine technologies:** Discussion of clinical cases of autoimmune disesaes

READINGS/BIBLIOGRAPHY

Sherris Medical Microbiology, Sixth Edition 6; Manual of Clinical Microbiology 11th edition Jorgensen and Pfaller; Henry's Clinical Diagnosis and Management by Laboratory Methods, 22nd Edition, Elsevier Health Sciences, 2011

TEACHING METHODS

The course will be based for the 80% of the course on lectures (n. hours = 100 hours) with the support of power points and for the 20% on Clinical Clerkship (n. hours = 25 hours)

EXAMINATION/EVALUATION CRITERIA

a) Exam type:

*For **integrated courses**, there should be one exam.*

Exam type	
written and oral	X
only written	
only oral	
project discussion	
other	

In case of a written exam, questions refer to: (*)	**Multiple choice answers**	X
	Open answers	
	Numerical exercises	

(*) multiple options are possible

b) Evaluation pattern:

This field needs to be filled in only when there are different weights among written and oral exams, or among modules if this refers to an integrated course.