UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Biomedicina, Neuroscienze e Diagnostica avanzata		
ACADEMIC YEAR	2020/2021		
MASTER'S DEGREE (MSC)	MEDICINE AND SURGERY		
INTEGRATED COURSE	LABORATORY MEDICINE - INTEGRATED COURSE		
CODE	04988		
MODULES	Yes		
NUMBER OF MODULES	3		
SCIENTIFIC SECTOR(S)	MED/07, BIO/12, MED/05		
HEAD PROFESSOR(S)	BALISTRERI CARMELA RITA	Professore Associato	Univ. di PALERMO
	CIACCIO MARCELLO	Professore Ordinario	Univ. di PALERMO
OTHER PROFESSOR(S)	FASCIANA TERESA MARIA ASSUNTA	Professore Associato	Univ. di PALERMO
	BALISTRERI CARMELA RITA	Professore Associato	Univ. di PALERMO
	GIAMMANCO GIOVANNI	Professore Ordinario	Univ. di PALERMO
	CIACCIO MARCELLO	Professore Ordinario	Univ. di PALERMO
	SCOLA LETIZIA	Professore Associato	Univ. di PALERMO
	LO SASSO BRUNA	Ricercatore a tempo determinato	Univ. di PALERMO
CREDITS	9		
PROPAEDEUTICAL SUBJECTS	13246 - SYSTEMATIC PATHOLOGY I - INTEGRATED COURSE 13248 - SYSTEMATIC PATHOLOGY II - INTEGRATED COURSE 13257 - SYSTEMATIC PATHOLOGY IV - INTEGRATED COURSE 13253 - SYSTEMATIC PATHOLOGY III - INTEGRATED COURSE		
MUTUALIZATION			
YEAR	4		
TERM (SEMESTER)	2° semester		
ATTENDANCE	Mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	**BALISTRERI CARMELA RITA**		
	Wednesday 10:00 12:00 Istituto di Patologia generale, Corso Tukory 211		
	CIACCIO MARCELLO		
	Monday 10:00 12:00 Sezione di Biochimica Clinica		
	Wednesday 10:00 12:00 Sezione di Biochimica Clinica		
	FASCIANA TERESA MARIA ASSUNTA		
	Monday 14:00 16:00 Via del Vespro 133. Plesso di Igiene e Microbiologia. Secondo Piano		
	GIAMMANCO GIOVANNI		
	Wednesday 13:00 14:00 Dipartimento di Promozione della Salute, Materno-Infantile, di Medicina Interna e Specialistica di Eccellenza "G. D'Alessandro", Via del Vespro 133, 90127, Palermo, Piano 2°		
	LO SASSO BRUNA		
	Tuesday 15:00 17:00 Sezione di Biochimica Clinica, Medicina Molecolare Clinica e Medicina di Laboratorio. Dipartimento di Biomedicina, Neuroscienze e Diagnostica avanzata		
	Thursday 15:00 17:00 Sezione di Biochimica Clinica, Medicina Molecolare Clinica e Medicina di Laboratorio. Dipartimento di Biomedicina, Neuroscienze e Diagnostica avanzata		

	SCOLA LETIZIA			
	Tuesday	10:00	13:00	Sezione di Patologia Generale del Dipartimento di Biopatologia e Biotecnologie Mediche

SCOLA LETIZIA

Tuesday   10:00   13:00   Sezione di Patologia Generale del Dipartimento di
Biopatologia e Biotecnologie Mediche

PREREQUISITES	The student will know the biochemistry and physiology of major organ systems that make up the human body and know the pathophysiology of major diseases.
LEARNING OUTCOMES	Targets of the Laboratory Medicine Integrated course are to acquire the basic knowledge (theoretical and practical) to critically evaluate the biochemical data at the in relation to human disease. In particular: • knowledge of the main laboratory tests and the cellular, molecular and pathophysiological basis which are prerequisites and foundation. • critical interpretation of laboratory tests results with regard to analytical and biological variation; reliability of diagnostic laboratory tests, examples of correct forms of laboratory reports. • basic concepts on the most relevant methodologies used in Clinical Biochemistry and their limitations. • appropriate use of laboratory tests in screening, staging and treatment of the disease. • correct interpretation of laboratory tests results and their critical correlation with molecular and cellular events induced by the disease. • acquisition of a proper programming prescription of tests in relation to the diagnosis or monitoring. Knowledge of the main diagnostic tests used in the laboratory of Clinical Biochemistry and diagnostic significance of reference change values of the main laboratory parameters. Proper ordering for laboratory tests and using of guidelines and flowchart based on "Evidence Based Medicine". Be able to relate to colleagues and health operating in laboratory to understand and synthesize relevant information about all the problems, understanding their content and devising and agreeing on how to study. Perform adequately the request of the most common laboratory tests. Implement self-protection measures in the collection and handling of biological samples.
ASSESSMENT METHODS	The learning assessment consists in itinere evaluations and an oral examination. There is a oral test (pre-test) of the Clinical Biochemistry module in preparation for the final oral examination of the Integrated Course. Concerning the clinical pathology module, at the end of the lesson cycle, students will be able to verify their degree of learning by completing a questionnaire with multiple choice answers to clinical pathologies queries. The correct answer number will generate a vote expressed in thirtieth-rating. Students may use the rate awarded when they will face the Laboratory Medicine Integrated Course examination. Oral examination consists in a conversation, order to check competences and subject knowledge required from the course; the evaluation is expressed in thirtieths. The questions will tend to test the learning achieved by assessing a) the knowledge captured; b) the processing capacity, c) possession of adequate exhibition capacityThe pass mark will be reached when the student shows knowledge and understanding of the issues at least in general terms, and has minimal application knowledge in order to solve concrete cases; the student will also have presentation skills and of argument as to allow the transmission of his knowledge to the examiner. Below this threshold, the examination will be insufficient.he more the candidate will be able to interact with the examiner with his argumentative and presentation skills, and the more his knowledge and application capabilities will go into detail on the subjects under evaluation, the more the judgment will be positive, according to the following scheme: - ECTS grade: A– A+ Excellent– Italian Grade: 30-30 cum laude Eccellente. Grade descriptors: Excellent knowledge of teaching contents; students should show high analytical and synthetic capabilities and should be able to apply their knowledge to solve highly complex problems. - ECTS grade: B Very good – Italian Grade: 27-29 Ottimo. Grade descriptors: Very good knowledge of the teaching contents and excellent language control; students should show analytical and synthetic skills and be able to apply their knowledge to solve problems of medium and, in some cases, even higher complexity. - ECTS grade: C Good – Italian Grade: 24-26 Buono. Grade descriptors: Good knowledge of teaching contents and good language control; the students should be able to apply their knowledge to solve problems of medium complexity. - ECTS grade: D Satisfactory – Italian Grade: 21-23 Discreto. Grade descriptors: Average knowledge of the teaching contents, in some cases limited to the main topics; acceptable ability to use the specific discipline language and independently apply the acquired knowledge. - ECTS grade: E Sufficient – Italian Grade: 18-20 Sufficiente. Grade descriptors: Minimum teaching content knowledge, often limited to the main topics; modest ability to use specific language of the disciplines and independently apply the acquired knowledge. - ECTS grade: F Fail – Italian Grade: 1-17 Insufficiente. Grade descriptors: Lack of an acceptable knowledge of the main teaching contents knowledge; very little or no ability to use the specific subject language and apply independently the

	acquired knowledge. A sufficient grade in each module is necessary to pass the final exam. If the mark is insuficient in any of the modules, the student cannot pass the final examination. Link: http://www.unipa.it/scuole/dimedicinaechirurgia
TEACHING METHODS	The didactic activity takes place through lectures.

PREREQUISITES	The student will need to know biochemistry, the physiology of major organ systems of the human body and the pathophysiology of major diseases. Basic knowledge of microbiology is also needed.
LEARNING OUTCOMES	The main target of the Laboratory Medicine Integrated course is the acquisition of basic knowledge (theoretical and practical) to critically evaluate the laboratory data related to human disease. In particular: • knowledge of the main laboratory tests and of the cellular, molecular and pathophysiological mechanisms they are based on. • ability to: critically evaluate laboratory tests results, considering their analytical and biological variability; evaluate the diagnostic reliability of laboratory tests; choose the correct form of reporting. • knowledge of the basic concepts on the most relevant methodologies used in the Clinical Laboratory and of their limitations. • ability to apply the knowledge for the appropriate use of laboratory tests in screening, diagnosis, staging, and treatment of the disease. • ability to correctly evaluate laboratory tests results and their critical correlation with molecular and cellular events induced by the disease. • Ability to acquire a personal programming/prescribing capacity depending on the diagnostic hypothesis or disease monitoring stage. Knowledge of the main diagnostic tests used in the medical laboratory and of the diagnostic significance of laboratory results. Ability to choose the most appropriate laboratory test and to use Evidence Based Medicine guidelines and flowcharts to obtain laboratory results that will be useful for the diagnostic and therapeutic follow-up of the patient. Ability to collaborate with colleagues and other professional figures working in the laboratory and to understand and synthesize relevant information on all issues, understanding their meaning and finding an agreement on how to investigate them. Ability to implement self-protection measures in the collection and handling of biological samples.
ASSESSMENT METHODS	The learning assessment consists of an oral final examination. An oral auto-evaluation test is also requested for the Clinical Biochemistry module. The final oral examination is an interview aimed at checking the required competencies and knowledge; the evaluation is expressed using a 30-point scale. The questions will aim at verifying the learning level achieved by assessing a) the acquired knowledge; b) the ability to elaborate, c) possession of an adequate capacity of expression. The threshold of sufficiency will be achieved when the student shows the knowledge and understanding of the topics at least in the general terms, and sufficient application competencies for the resolution of concrete cases; the student should also have exhibits and arguments that will allow him to pass on his knowledge to the examiner. Below this threshold, the examination will be insufficient. The more the candidate will be able to interact with the examiner with his argumentative and presentation skills, and the more his knowledge and application capabilities will go into detail on the subjects under evaluation, the more the judgment will be positive, according to the following scheme: - ECTS grade: A– A+ Excellent– Italian Grade: 30-30 cum laude Eccellente. Grade descriptors: Excellent knowledge of teaching contents; students should show high analytical and synthetic capabilities and should be able to apply their knowledge to solve highly complex problems. - ECTS grade: B Very good – Italian Grade: 27-29 Ottimo. Grade descriptors: Very good knowledge of the teaching contents and excellent language control; students should show analytical and synthetic skills and be able to apply their knowledge to solve problems of medium and, in some cases, even higher complexity. - ECTS grade: C Good – Italian Grade: 24-26 Buono. Grade descriptors: Good knowledge of teaching contents and good language control; the students should be able to apply their knowledge to solve problems of medium complexity. - ECTS grade: D Satisfactory – Italian Grade: 21-23 Discreto. Grade descriptors: Average knowledge of the teaching contents, in some cases limited to the main topics; acceptable ability to use the specific discipline language and independently apply the acquired knowledge. - ECTS grade: E Sufficient – Italian Grade: 18-20 Sufficiente. Grade descriptors: Minimum teaching content knowledge, often limited to the main topics; modest ability to use specific language of the disciplines and independently apply the acquired knowledge. - ECTS grade: F Fail – Italian Grade: 1-17 Insufficiente. Grade descriptors: Lack of an acceptable knowledge of the main teaching contents knowledge; very little or no ability to use the specific subject language and apply independently the acquired knowledge.
TEACHING METHODS	Teaching will be provided through frontal lessons in Italian.

MODULE
CLINICAL MICROBIOLOGY

Prof. GIOVANNI GIAMMANCO - Sede IPPOCRATE, - Sede IPPOCRATE

AMBIT	50401-Patologia generale e molecolare, immunopatologia, fisiopatologia generale, microbiologia e parassitologia
INDIVIDUAL STUDY (Hrs)	45
COURSE ACTIVITY (Hrs)	30
EDUCATIONAL OBJECTIVES OF THE MODULE	
Acquire basic knowledge for the correct choice of the most appropriate analytical techniques for the laboratory diagnosis of infectious diseases and acquire the essential knowledge for critical evaluation and interpretation of the results obtained.	

SYLLABUS

Hrs	Frontal teaching
3	Introduction to Clinical Microbiology: discipline tasks, organization of the diagnostic microbiology laboratory, progress towards automation. Methods of sampling, storage, and transport to the laboratory of clinical samples for microbiological examinations.
3	Skin infections: Main pathogens. Choice of investigations for specific pathologies: piodermites, superficial mycoses, warts, herpetic lesions. Interpretation of results.
3	CNS infections: Main pathogens. Choice of investigations for specific pathologies: bacterial meningitis, viral menigo-encephalitis, mycoses of the nervous system, tetanus, botulism, prion diseases. Interpretation of results.
3	Infections of the cardiovascular and lymphatic system: Main pathogens. Choice of investigations for specific pathologies: sepsis and septic shock, endocarditis, myocarditis, pericarditis, acquired immunodeficiency syndrome. Interpretation of results.
3	Respiratory tract infections: Main pathogens. Choice of investigations for specific pathologies: pharyngitis, laryngitis, pneumonia, tuberculosis. Interpretation of results.
3	Infections of the gastrointestinal tract: Main pathogens. Choice of investigations for specific pathologies: peptic ulcer, diarrhea, dysentery, viral hepatitis. Interpretation of results.
3	Urinary tract infections: Main pathogens. Choice of investigations for specific pathologies: sexually transmitted infections, cystitis. Interpretation of results.
3	Zoonoses and vector borne infections: Major pathogens. Choice of investigations from individual pathologies: brucellosis, anger, malaria, leishmaniasis, rickettsiosis, arbovirus encephalitis. Interpretation of results.
3	Infections of the fetus, infant, childhood and adolescence: Main pathogens. Selection of the investigations indicated by individual pathologies: infections of the TORCH complex, measles, varicella, mumps, infectious mononucleosis. Interpretation of results.
3	Opportunistic and nosocomial infections: Main pathogens. Selection of the investigations indicated by individual pathologies: aspergillosis, candidiasis, pneumocystosis, cryptococcosis, toxoplasmosis. Interpretation of results.

MODULE	
CLINICAL BIOCHEMISTRY	

Prof. MARCELLO CIACCIO - Sede CHIRONE, - Sede CHIRONE, - Sede IPPOCRATE, - Sede IPPOCRATE

SUGGESTED BIBLIOGRAPHY	
M. Ciaccio. Elementi di Biochimica Clinica e Medicina di Laboratorio. EdiSES, 2020. M. Ciaccio, G. Lippi. Biochimica Clinica Medicina di Laboratorio. III edizione, EdiSES, 2020.	
AMBIT	50402-Medicina di laboratorio e diagnostica integrata
INDIVIDUAL STUDY (Hrs)	45
COURSE ACTIVITY (Hrs)	30
EDUCATIONAL OBJECTIVES OF THE MODULE	

Acquisition of basic and applied concepts of clinical biochemistry in order to evaluate methods and clinical applications of laboratory tests critically. Specific aim of the course is to be able to identify the correct tests in relation to clinical conditions of the patients and to be able to understand them in relation to the diagnosis.
Particularly, the students must:
•know the main laboratory tests and the biological, molecular and pathological basis for their use in medicine;
•use laboratory tests in screening, diagnosis, prognosis and therapy of diseases correctly;
•understand laboratory tests results and connect them to the molecular and cellular aspect of the pathologic state
•order laboratory tests appropriately in relation to diagnostic hypothesis or monitoring.
Knowledge of the molecular mechanisms underlying the main clinical syndromes arising from genetic alteration.

SYLLABUS

Hrs	Frontal teaching
3	Pre-analytical phase: preparation of the patient, collection of biological samples, processing and identification of biological samples. General laboratory techniques with descriptions of the principles - colorimetry, turbidimetry, nephelometry, fluorimetry, atomic absorption and emission, potentiometric electrochemical techniques, kinetic reactions, electrophoresis, immunoelectrophoresis, immunofixation, immunochemical analysis with monoclonal antibodies, isoelectric focusing, chromatography, radioimmunoassay, count cell, flow cytometry, clinical microscopy, mass spectrometry, HPLC, molecular biology and recombinant DNA technologies, multiple analyzers, magnetic resonance spectroscopy, PET.
2	Post-analytical phase: data collection, calculation, automatic processing. Analytical variation, analytical error, quality control systems. Intra-individual and inter-individual biological variation, reference values, nomenclature and reporting of laboratory tests. Clinical sensitivity and specificity, predictive laboratory tests. Methodological approaches in clinical biochemistry. The main analytical techniques, automation in clinical biochemistry.
2	Enzymes: tissue and organ profiles. Acid and alcalin phosphatase, aldolase, aminotrasferase, LDH, gammaGT, cholinesterase, amylase, lipase, protease, G-6-PD, piruvate kinase, lysozyme.
2	Metabolism of glucose: Diabetes: biochemistry of DMT1 and DMT2; biochemistry of diabetes complications; clinical biochemistry diagnostics (serum glucose, urine glucose, insulin, C-peptide, glucagon, cortisol, GH, glicated proteins and their significance, OGTT, ketone bodies in serum and urine, lactic acid, piruvic acid, dyslipidemia in diabetic patients, urine test in diabetic patients. Hypoglicemia: clinical biochemistry
2	Metabolism of lipids: Fatty acids, cholesterol, HDL-cholesterol, LDL-choletserol, tryglicerides, phospholipids. Lipoprotein. Dyslipidemia. Hypercholesterolemia. Atherosclerosis and cardiovascular diseases. Metabolic syndrome. Myocardial infarction: risk factors, biochemical modification in the necrotic area; clinical enzymes, new markers of myocardial infarction. Biomarkers in heart failure. Thrombophilia.
2	Metabolism of proteins: Plasma proteins. Electrophoresis of plasma proteins: interpretation of results. Laboratory evaluation of kidney function. Clinical biochemistry of kidney disease. Urinalysis. Hyperammonemia. Clinical biochemistry of liver failure. Urea metabolism: clinical biochemistry of enzymatic deficiency
2	Endocrine system: Clinical biochemistry of hypothalamus-pituitary axis: GH and growth, prolactin and amenorrhea, GnRH, LH, FSH and reproduction, ACTH, TSH e functional tests. Clinical biochemistry of endocrine pancreas: insulin and glucagon, somatostatin.
2	Clinical biochemistry of gastrointestinal hormones. Clinical biochemistry of adrenal cortex hyperplasia and hypofunction. Clinical biochemistry of hyperthyroidism, thyreotoxicosis, hypothyroidism. Clinical biochemistry of testis, ovary and sex differentiation. Laboratory tests to monitoring pregnancy
2	Clinical biochemistry of bone metabolism. Clinical biochemistry of osteoporosis and osteomalacia. Calcium homeostasis. Hormone receptors and their importance in clinical biochemistry. Clinical biochemistry of arterial pressure regulation: ANF, catecholamines, glucocorticoids. Essential hypertension and secondary forms.
1	Clinical biochemistry of acid base balance. Arterial blood gas (ABG): interpretation and reporting.

2	Clinical Biochemistry of liver diseases. Clinical Biochemistry of jaundice. Clinical biochemistry of exocrine pancreas. Clinical Biochemistry of heme metabolism Clinical Biochemistry of rheumatic, connective and autoimmune diseases. Laboratory diagnostics of allergic diseases
2	Cancer diseases: biochemistry of cancer; metastasis, biomarkers.Liquid biopsy. Biochemistry of nutrition and its surveillance.
2	Laboratory tests in genetic diseases. Laboratory tests in myopathies. Clinical biochemistry of neuro-psychiatric diseases. Biochemistry of pain. Alzheimer's disease and other neurodegenerative dementias. Clinical biochemistry of cerebro-spinal fluid. Biomarkers of cognitive impairment.Clinical biochemistry in shock, trauma and surgery.
2	Fever of unknown origin. Inflammatory biomarkers. Sepsis biomarkers. Laboratory Exercise Medicine. Preoperative examinations. Laboratory testing in Urgency / emergency. Biobank. HTA in Laboratory Medicine. Laboratory testing drug abuse.
2	Clinical molecular biology: diagnostic techniques used for the diagnosis of the main genetic diseases. Main chromosomal abnormalities revealed by karyotyping. Monogenic diseases and DNA typing. DNA mutations analysis by direct and indirect analyzes (restriction polymorphism). PCR reaction (polymerase chain reaction) for the amplification of abnormal DNA sequences. In vivo clinical biochemistry.

MODULE
CLINICAL BIOCHEMISTRY

Prof.ssa BRUNA LO SASSO - Sede HYPATIA, - Sede HYPATIA

SUGGESTED BIBLIOGRAPHY	
Ciaccio-Lippi. Biochimica Clinica e Medicina di Laboratorio. Edises Panteghini -interpretazione dei dati di laboratorio- Piccin	
AMBIT	50402-Medicina di laboratorio e diagnostica integrata
INDIVIDUAL STUDY (Hrs)	45
COURSE ACTIVITY (Hrs)	30
EDUCATIONAL OBJECTIVES OF THE MODULE	
-optimal knowledge and comprehension of the mostly used guide lines and flow charts in clinical practice-EBM -problem solving, from lab test to clinical diagnosis. -excellent communication and analytical-synthetical ability.	

SYLLABUS

Hrs	Frontal teaching
3	Laboratory tests: definition, types, requests. Pre-analytical phase: preparation of the patient, collection of biological samples, processing and identification of biological samples. General laboratory techniques with descriptions of the principles - colorimetry, turbidimetry, nephelometry, fluorimetry, atomic absorption and emission, potentiometric electrochemical techniques, kinetic reactions, electrophoresis, immunoelectrophoresis, immunofixation, immunochemical analysis with monoclonal antibodies, isoelectric focusing, chromatography, radioimmunoassay, count cell, flow cytometry, clinical microscopy, mass spectrometry, HPLC, molecular biology and recombinant DNA technologies, multiple analyzers, magnetic resonance spectroscopy, PET.
2	Post-analytical phase: data collection, calculation, automatic processing. Analytical variation, analytical error, quality control systems. Intra-individual and inter-individual biological variation, reference values, nomenclature and reporting of laboratory tests. Clinical sensitivity and specificity, predictive laboratory tests. Methodological approaches in clinical biochemistry. The main analytical techniques, automation in clinical biochemistry. Biotechnologies and Clinical Biochemistry
2	Enzymes: tissue and organ profiles. Acid and alcalin phosphatase, aldolase, aminotrasferase, LDH, gammaGT, cholinesterase, amylase, lipase, protease, G-6-PD, piruvate kinase, lysozyme.
3	Metabolism of glucose: Diabetes: biochemistry of DMT1 and DMT2; biochemistry of diabetes complications; clinical biochemistry diagnostics (serum glucose, urine glucose, insulin, C-peptide, glucagon, cortisol, GH, glicated proteins and their significance, OGTT, ketone bodies in serum and urine, lactic acid, piruvic acid, dyslipidemia in diabetic patients, urine test in diabetic patients. Hypoglicemia: clinical biochemistry
2	Metabolism of lipids: Fatty acids, cholesterol, HDL-cholesterol, LDL-choletserol, tryglicerides, phospholipids. Lipoprotein. Dyslipidemia. Hypercholesterolemia. Atherosclerosis and cardiovascular diseases.
2	Metabolism of proteins: Plasma proteins. Electrophoresis of plasma proteins: interpretation of results. Clinical biochemistry of kidney disease. Hyperammonemia. Clinical biochemistry of liver failure. Urea metabolism: clinical biochemistry of enzymatic deficiency
2	Endocrine system: Clinical biochemistry of hypothalamus-pituitary axis: GH and growth, prolactin and amenorrhea, GnRH, LH, FSH and reproduction, ACTH, TSH e functional tests. Clinical biochemistry of endocrine pancreas: insulin and glucagon, somatostatin.
2	Clinical biochemistry of gastrointestinal hormones. Clinical biochemistry of adrenal cortex hyperplasia and hypofunction. Clinical biochemistry of hyperthyroidism, thyreotoxicosis, hypothyroidism. Clinical biochemistry of testis, ovary and sex differentiation.
2	Clinical biochemistry of rickets. Clinical biochemistry of osteoporosis and osteomalacia. Calcium homeostasis. Hormone receptors and their importance in clinical biochemistry. Clinical biochemistry of arterial pressure regulation: ANF, catecholamines, glucocorticoids. Essential hypertension and in the secondary forms.
2	Clinical biochemistry of acid base balance. Blood gas analysis: interpretation and reporting. Myocardial infarction: risk factors, biochemical modification in the necrotic area; clinical enzymes, new markers of myocardial infarction.

2	Clinical Biochemistry of jaundice.
	Clinical biochemistry of exocrine pancreas.
	Clinical biochemistry of healthy and pathologic renal function
	Clinical Biochemistry of heme metabolism
	Clinical Biochemistry of rheumatic, connective and autoimmune diseases.
2	Cancer diseases: biochemistry of cancer; metastasis, biomarkers.
	Biochemistry of nutrition and its surveillance.
2	Laboratory tests in genetic diseases.
	Laboratory tests in myopathies.
	Clinical biochemistry of neuro-psychiatric diseases.
	Biochemistry of pain.
	Clinical biochemistry of cerebro-spinal fluid.
	Clinical biochemistry in shock, trauma and surgery. markers of neurodegeneration and cognitive impairment.
2	Clinical molecular biology: diagnostic techniques used for the diagnosis of the main genetic diseases. Main chromosomal abnormalities revealed by karyotyping. Monogenic diseases and DNA typing. DNA mutations analysis by direct and indirect analyzes (restriction polymorphism). PCR reaction (polymerase chain reaction) for the amplification of abnormal DNA sequences.

MODULE
CLINICAL PATHOLOGY

Prof.ssa CARMELA RITA BALISTRERI - Sede CHIRONE, - Sede CHIRONE

SUGGESTED BIBLIOGRAPHY

Marcello Ciaccio,Giuseppe Lippi- "Biochimica Clinica e Medicina di Laboratorio". EdiSES II edizione.
Italo Antonozzi-Elio Gulletta -"Medicina di laboratorio -Logic & patologia Clinica"-Piccin-III Edizione.
Manuale tecnico della banca del sangue. Sono inoltre a disposizione degli studenti le presentazioni (.ppt) utilizzate durante le lezioni ed, a richiesta, articoli scientifici di approfondimento su specifici argomenti .

AMBIT	50402-Medicina di laboratorio e diagnostica integrata
INDIVIDUAL STUDY (Hrs)	45
COURSE ACTIVITY (Hrs)	30

EDUCATIONAL OBJECTIVES OF THE MODULE

Teaching of Clinical Pathology are to allow the students acquire the basic knowledge (theoretical and practical) that allow them to critically evaluate the significance of laboratory data obtained in connection with a pathological condition. The student will acquire the methodological and cultural bases, as well as the experience to know how to decide on the desirability of special tests or analyzes and have the ability to access the analytical data as a particular diagnostic instrument .In 'expected to know the main examinations laboratory and the biological basis, molecular and pathophysiological which are prerequisites and foundation; he who approaches the study of laboratory Medicine should be able to provide a critical interpretation of the analytical results with regard to the uncertainty, measurement and biological variability; must evaluate the diagnostic accuracy of laboratory investigations, then applying the formulas correct reporting. Finally, information is provided on the characteristics and limitations of the most important methods used in Clinical Pathology, the correct use of tests in screening procedures, diagnosis, staging and therapeutic response of the disease..
Verify of kwowleges: the oral examination is characterized by three questions
abouts the most important of ClinicalPathology.The 'threshold will be reached if the student shows knowledge and understanding of the topics, at least in general lines and have minimum application expertise on the use of laboratory tests in the attivita' diagnostic and operative of the dental practice; must 'also possess skills' exhibition such as to allow the examinar evaluetion.Al below this threshold the examination result 'insufficiente.As much is able to interact with the examiner and as much' her knowledge and capacity 'applications goes into detail of the discipline, the more' evaluation will be 'positive.The valuation is thirty and is obviously compared and integrated ponderalmente to that on the assessment of the preparation on the second module of the course. (Pathological anatomy).

SYLLABUS

Hrs	Frontal teaching
5	Logic of diagnostic laboratory and the laboratory examinations: - The organization of the clinically Pathology laboratory diagnostics strumentale- The evaluation of the data Instrumental Laboratory - Pre-analysis and Analytical Variability - The validation of the samples - Quality Controls Sensitivity 'and Analytical specificity and diagnostics
6	The patient with hematologic diseases: - The examination Hemocromocitometrico. Application of Cytometry and flow cytometry to analysis of hematologic diseases
5	Applications of Flow Cytometry and flow cytometry to patients with diseases coagulative- Emostasi- examinations of first and second level Diagnostics of the causes of bleeding diathesis and thrombophilia
6	The Laboratory Indexes in cardiovascular diseases and susceptibility to Coronaropatia- Diagnostic Applications IMA in the POCT..Role of the laboratory in the evaluation of the hypertensive patient.VES and PCR.Protective and prognostic markers of the chronic inflammatory pathologies of the intestine, The laboratory in the diagnosis of pancrtitis The patient with diseases of the Immune System: Serological pictures of organ-specific and systemic autoimmune pathologies. Laboratory diagnosis of congenital and acquired immunodeficiencies; The laboratory in allergies and intolerances. Blood Gasanalysis
3	The patient with urinary tract infections: - Examination of Urine
2	Special tests on body fluids: - generalized edema, and edema localizzati- Examination of ascites fluid and the liquid pleurico- of liquor Examination
3	Blood Groups ABO,RH systems,Irregular antibodies,Cross-match,Hemocomponents and clinical application

MODULE
CLINICAL PATHOLOGY

Prof.ssa CARMELA RITA BALISTRERI - Sede HYPATIA, - Sede HYPATIA

SUGGESTED BIBLIOGRAPHY	
Medicina di Laboratorio - M. Laposata - Ed. Piccin Manuale di Patologia Clinica – I. Antonozzi – Ed. Piccin, terza edizione	
AMBIT	50402-Medicina di laboratorio e diagnostica integrata
INDIVIDUAL STUDY (Hrs)	45
COURSE ACTIVITY (Hrs)	30
EDUCATIONAL OBJECTIVES OF THE MODULE	
Objectives of Clinical Pathology teaching are to enable students to acquire the basic techniques and application of clinical pathology that can allow them to use the most appropriate clinical procedures for the patient' s preparation to laboratory tests, collecting biological samples, management of reports and identifying the advantages and limitations.	

SYLLABUS

Hrs	Frontal teaching
2	Biomarkers and their biological , pre-analytical, analytical variability and their applications in the functional assessment or tissue damage and organ
6	Blood and its components, their functions. Counts of blood cells and their applications in the diagnosis laboratory of blood disorders, such as anemia. Alterations in leukocyte formula and their applications in immune disorders
3	Pathophysiology of autoimmune diseases, their classification and diagnostic criteria. Biomarkers in their diagnosis laboratory
3	Systemic Inflammatory response and sepsis. Their laboratory diagnosis with SOFA score. The utility of inflammatory and emerging biomarkers
3	Liver diseases and their laboratory diagnosis: the classical and news biomarkers, and their utility in diagnostic and prognostic algorithms
3	Allergy diseases and their laboratory diagnosis: CRD diagnosis and the use of classical and emerging biomarkers, algorithms
3	Neurological diseases and laboratory diagnosis. Multiple sclerosis
4	Cancer diseases and the use of different tumor biomarkers in their laboratory diagnosis, and algorithms
3	Clinical pathology in geriatrics: biomarkers

MODULE
CLINICAL PATHOLOGY

Prof.ssa LETIZIA SCOLA - Sede IPPOCRATE, - Sede IPPOCRATE

SUGGESTED BIBLIOGRAPHY	
Medicina di Laboratorio - M. Laposata - Ed. Piccin Manuale di Patologia Clinica – I. Antonozzi – Ed. Piccin, terza edizione	
AMBIT	50402-Medicina di laboratorio e diagnostica integrata
INDIVIDUAL STUDY (Hrs)	45
COURSE ACTIVITY (Hrs)	30
EDUCATIONAL OBJECTIVES OF THE MODULE	
Objectives of Clinical Pathology teaching are to enable students to acquire the basic techniques and application of clinical pathology that can allow them to use the most appropriate clinical procedures for the patient' s preparation to laboratory tests, collecting biological samples, management of reports and identifying the advantages and limitations.	

SYLLABUS

Hrs	Frontal teaching
2	Biomarkers and their biological , pre-analytical, analytical variability and their applications in the functional assessment or tissue damage and organ
6	Blood and its components, their functions. Counts of blood cells and their applications in the diagnosis laboratory of blood disorders, such as anemia. Alterations in leukocyte formula and their applications in immune disorders
3	Pathophysiology of autoimmune diseases, their classification and diagnostic criteria. Biomarkers in their diagnosis laboratory
3	Systemic Inflammatory response and sepsis. Their laboratory diagnosis with SOFA score. The utility of inflammatory and emerging biomarkers
3	Liver diseases and their laboratory diagnosis: the classical and news biomarkers, and their utility in diagnostic and prognostic algorithms
3	Allergy diseases and their laboratory diagnosis: CRD diagnosis and the use of classical and emerging biomarkers, algorithms
3	Neurological diseases and laboratory diagnosis. Multiple sclerosis
4	Cancer diseases and the use of different tumor biomarkers in their laboratory diagnosis, and algorithms
3	Clinical pathology in geriatrics: biomarkers