DISCIPLINE SHEET

ACADEMIC YEAR

2022-2023

1. DATA ABOUT THE STUDY PROGRAM

1.1 Institution of higher education	UNIVERSITY OF MEDICINE AND PHARMACY OF CRAIOVA
1.2 Faculty	**MEDICINE**
1.3 Department	2
1.4 Study Domain	HEALTH
1.5 Study cycle	LICENCE
1.6 Study program/ Qualification	MEDICINE

2. DATA ABOUT THE DISCIPLINE

2.1 DISCIPLINE NAME				**CLINICAL BIOCHEMISTRY**	
2.2. Discipline code				**MED3206**	
2.3 The holder of course activities				Sandu Raluca Elena	
2.4 The holder of seminar activities				-	
2.5. Academic degree				Assoc. Prof.	
2.6. Employment (base norm/associate)				Base norm	
2.7. Year of study	**III**	2.8. Semester	**II**	2.9. Course type (content) 2.10. Regime of discipline (compulsoriness)	**CDD**

3. TOTAL ESTIMATED TIME (teaching hours per semester)

3.1 Number of hours per week	**1**	3.2 From which - course	**1**	3.3 seminary/laboratory	**-**
3.4 Total hours in curriculum	**14**	3.5 From which - course	**14**	3.6 seminary/laboratory	**-**
Time found distribution (hours):					
Study by manual, course support, bibliography, and notes					**9**
Additional documentation in the library, specialized electronic platforms and on the field					**8**
Training seminars / laboratories, homework, reports, portfolios, and essays					**8**
Tutoring					**2**
Examinations					**4**
Other activities, counselling, student circles					**5**

3.7 Total hours of individual study	**36**
3.9 Total hours per semester	**50**
3.10 Number of credits	**2**

4. PRECONDINTIONS (where appropriate)

4.1 curriculum	Students must have basic knowledge of chemistry and biology at preuniversity level
4.2 competency	-

5. CONDITIONS (where appropriate)

5.1. of curse deployment	Lecture hall with projector / online
5.2. of seminary/ laboratory deployment	-

6. SPECIFIC ACQUIRED COMPETENCES

PROFESSIONAL COMPETENCES

C1 – To be able to identify the illness and to determine the correct diagnosis of the disease (diseases).
C4 – To address the health /disease problems from the community perspective in direct relation with the social, economic and/or cultural conditions of specified community.
C5 - To initiate and conduct a scientific research and/or formative activity in their competency domain.

TRANSVERSAL COMPETENCES	**CT1.** Autonomy and responsibility: • acquisition of moral guidelines, professional and civic skills that enable students to be fair, honest, non-confrontational, cooperative, empathetic in front of suffering, available to help others, interested in the development of the community • to be able to recognize a problem when it appears and to offer a responsible solutions for it **CT2.** Social interaction: • understanding, non-discrimination and respect for diversity and multiculturalism; • to have and to acquire team work abilities • to be able to communicate verbally and in written the requests, working procedure, obtain results and to consult with the group • get involved in volunteering, to acknowledge the essential problems of the community **CT3.** Personal and professional development: • to be open to lifelong learning; • appreciate the need for individual study as the basis of personal autonomy and professional development • the value their own potential in collective activities with creativity and objectivity • know how to use information and communication technology.

7. DISCIPLINE OBJECTIVES (based on the grid of specific competences acquired)

7.1 The general objective of the discipline	To give the students the general knowledge about the biochemical characteristics of the constituents of the living organisms - to help the students to accumulate the required knowledge for understanding of the metabolic transformations occurring in living organisms in correlation with their physiological and pathological mechanisms
7.2 The specific objectives of the discipline	- Accumulation of the basic knowledge required for understanding of the biochemical processes in maintaining the health status; - Understanding the biochemical mechanisms that determine specific diseases; - Understanding the mechanism of action of the drugs; - Acknowledge the importance of laboratory determinations which are sensitive and reproducible and the correct interpretation of the obtain results in the context of a cooperation between the doctor and the laboratory specialist; **After the completion of the discipline, students are expected to:** - acquire a strong basis in biochemistry knowledge, to understand the concepts and the fundamental truth in order to be able to solve qualitative and quantitative problems in biochemistry - to identify, evaluate, understand and resume information and clinical data - to present a scientific results orally and written The acquired cognitive and practical skills must allow the student to: - to correctly execute the work protocol for a specific biochemical analysis - identify the obtained values and to interpret them in a physiological and pathological context - to identify the factors that lead to variations in biochemical parameters ■ integrate the theoretical and practical knowledge acquired in the discipline of biochemistry with those obtained from other fundamental disciplines and use them as a platform for clinical training; ■ to clearly and rigorously communicate the knowledge gained or the results obtained; - issue working hypotheses and verify them by experiment ■ organize the performance of the practical work: form a team, divide the tasks, collaborate, communicate the requirements, prepare the materials, follow a given protocol, record the results, communicate the results, discuss them in the team; ■ to use the didactic material and specific equipment from the biochemistry laboratory; ■ to perform different methods to emphasize or to determine some biochemical parameters **ATITUES** • to be open to the acquisition of moral guidelines, the formation of professional and civic attitudes, which allow students to be correct, honest, non-conflictual, cooperative, understanding in the face of suffering, available to help people, interested in the development of the community; • to know, respect and contribute to the development of moral values and professional ethics; • to learn to recognize a problem when it arises and to offer responsible

	solutions to solve it. • to recognize and have respect for diversity and multiculturalism; • to have or learn to develop teamwork skills; • to communicate orally and in writing the requirements, working procedure, the results obtained, to consult with the team; • to get involved in voluntary actions, to know the essential problems of the community. • to be open to lifelong learning, • to be aware of the need for individual study as the basis of personal autonomy and professional development; • to utilize optimally and creatively their own potential in collective activities; • to know how to use information and communication technology; • to take initiative, to get involved in the educational and scientific activities of the discipline

8. CONTENTS

8.1 Course (content units)	Hours
Basic concepts in the interpretation of pathological variations of serum enzymes. Clinical applications of transaminase activity, CK, LDH, gamma-GT, alkaline phosphatase, acid phosphatase, amylase and pancreatic lipase.	**1**
Basic concepts in the interpretation of pathological variations of bilirubin Heme degradation. Iron metabolism. Jaundice.	**1**
Basic concepts in the interpretation of pathological variations of non-protein nitrogenous compounds Metabolism of urea, creatinine, uric acid- normal and pathological aspects.	**1**
Biochemical indicators in hepaatic diseases Structural and functional elements. Laboratory investigation of liver functions. Indicators of necrosis. Cholestasis indicators. Immunological indicators. Tumor indicators.	**1**
Biochemical indicators in pancreatic diseases Laboratory diagnosis of pancreatic diseases. Acute pancreatitis. Chronic pancreatitis. Malignant pancreatic tumors.	**1**
Biochemical indicators in kidney diseases Kidney functions. Biochemical evaluation of renal function. Tests to investigate glomerular function. Tests to investigate tubular function. Global indicators of renal function – urinalysis/proteinuria	**1**
Biochemical indicators in cardiovascular diseases Markers of acute coronary syndrome. Inflammatory markers with predictive value for acute coronary syndromes. Risk factors of cardiovascular diseases. Assessment biomarkers of atherosclerosis and heart failure	**1**
Basic concepts in the interpretation of amino acid metabolism disorders Aminoacidopathies, Phenylketonuria, Alkaptonuria, Albinism, Cystinuria. Homocystinuria.	**1**
Basic concepts in the interpretation of protein metabolism disorders Protein functions. Plasma proteins. Immunoglobulins. Hypergammaglobulinemia and hypogammaglobulinemia. Monoclonal hypergammaglobulinemias. Multiple myeloma. Waldenstrom macroglobulinemia.	**1**
Basic concepts in the interpretation of disorders of carbohydrate metabolism Disorders of carbohydrate metabolism – Hyperglycemia/Hypoglycemia. Diabetes mellitus. The role of laboratory tests in the differential diagnosis of patients with changes in glucose metabolism.	**1**
Basic concepts in the interpretation of lipid metabolism disorders The role of lipids in the body. Lipoproteins. Clinical significance. Hyperlipoproteinemias. Metabolic syndrome	**1**
Basic concepts in the interpretation of disorders of calcium, phosphate and magnesium metabolism Systems involved in the regulation of calcium metabolism. Hypercalcemia. Hypocalcemia. Hypermagnesemia. hypomagnesemia	**1**
Paraclinical and metabolic aspects in malignant proliferations Metabolic transformations in malignant cells. Early diagnosis of malignant proliferations. Enzymes and isozymes. Special serum proteins. Determination of tumor markers. Recommendations for the use of tumor markers.	**1**
Biochemical and cytological investigation of cerebrospinal fluid Cerebrospinal fluid formation, physical-chemical characteristics, cytological analysis. Practical protocol for the CSF examination. Pathological aspects	**1**

BIBLIOGRAPHY

1. Bărbulescu Andreea, **Sandu Raluca Elena**, Surugiu Roxana Laborator clinic și interferențe farmacologice, Volumul II, Editura Medicală Universitară, 2022, ISBN978-973-106-368-35
2. Bărbulescu Andreea, **Sandu Raluca Elena**, Laborator clinic și interferențe farmacologice, Volumul I, Editura Medicală Universitară, 2020,ISBN 978-973-106-310-2
3. Minodora Dobreanu. Biochimie clinică implicații practice. Ediția a II-a. Editura pim Iași 2020
4. Minodora Dobreanu. Biochimie clinică implicații practice vol 1. Editura Medicală 2010
5. Fundamentals of Clinical Chemistry and Molecular Diagnostics, Carl A. Burtis, David E. Burtis Tietz, Eighth Edition, 2019
6. Clinical Chemistry: Principles, Techniques, and Correlations, Michael L. Bishop, Edward P. Fody, Larry E. Schoeff, Seventh Edition, 2013
7. V. Dinu, E. Truţia, E. Popa-Cristea, A. Popescu. Biochimie medicală (mic tratat). Editura medicală, Bucureşti, 1996
8. Löffler/Petrides Biochemie und Pathobiochemie, 2014
9. Marks'Basic Medical Biochemistry: A Clinical Approach, Fifth Edition, Michael Lieberman, PhD, Allan D. Marks, MD, 2017

8.2 Practical work (topics / themes)

9. CORROBORATING THE DISCIPLINE CONTENT WITH THE EXPECTATIONS OF EPISTEMIC COMMUNITY REPRESENTATIVES, PROFESSIONAL ASSOCIATIONS AND EMPLOYEE REPRESENTATIVES RELATING TO THIS PROGRAM

The knowledge, practical skills and attitudes learned in this discipline provide the basis for the study of pathological processes that will be detailed in other disciplines and are the basis for understanding and learning any preventive, diagnostic, curative or recovery medical act

10. MHETODOLOGICAL LANDMARKS

Types of activity	Teaching Techniques / learning materials and resources: exposure, interactive lecture, working groups, learning by problem/project solving, etc. In case of special situations (alert states, emergency conditions, other types of situations that limit the physical presence of people) the activity can be carried out online using computer platforms approved by the faculty/university. The online education process will be adapted accordingly to ensure the fulfilment of all the objectives set out in the discipline sheet
Course	The fallowing combined methods will be used: lectures, debate, explanation, problem based learning. For online activities lectures, debate, explanation, problem based learning based on pregiven materials.
Individual study	Before each course

11. RECOVERY PROGRAM

	Number of hours	Place of deployment	Period	Responsible	Scheduling of topic
Schedule consultations / Students' Scientific Circle	1 hour/ week	Biochemistry lab / online	Weekly	Disipline holder	According to the weekly schedule
Program for students poorly trained	1 hour/ week	Biochemistry lab / online	Weekly	Disipline holder	According to the diciplin schedule

12. ASSESMENT

Activity	**Types of assesment**	**Methos of evaluation**	**Percentage from final grade**
Lecture	Random formative assesment during the semester Summative assesment during the exam	Written multiple choice exam/With the use of informatics platform in the online version platform	**80%**
Periodic assesment			10%
Assement of individual activities			10%
Minimum performance standard			at least 50% for each component of the evaluation

13. GUIDANCE AND COUNSELLING PROGRAMS		
Professional guidance and counselling programs (2 hours/monthly)		
Scheduling the hours	**Place of deployment**	**In charge**
Last Friday of the month	Biochemestry laboratory	Disipline holder

Endorsement date in the department: 27.09.2022

Department Director,
Prof. Eugen Osiac

Coordinator of study program,
Prof. Marius Eugen Ciurea

Discipline holder,
Conf. Univ. Dr. Sandu Raluca