FIŞA DISCIPLINEI

1. Date despre program

1.1 Instituţia de învăţământ superior	**UNIVERSITATEA DE MEDICINA SI FARMACIE "VICTOR BABEŞ" TIMIŞOARA**
1.2 Facultatea	**FACULTATEA DE MEDICINĂ DENTARĂ**
1.3 Departamentul	IV BIOCHIMIE ŞI FARMACOLOGIE
1.4 Domeniul de studii de .....[1)]	Licenţă
1.5 Ciclul de studii[2)]	Licenţă
1.6 Programul de studii/ Calificarea	Dental Medicine

2. Date despre disciplină

2.1. Denumirea disciplinei	**BIOCHIMIE ŞI BIOCHIMIA CAVITĂŢII ORALE**							
2.2 Titularul activităţilor de curs				Prof. univ. Dr. Catalin Marian				
2.3 Titularul activităţilor de laborator				1. As. univ. Dr. Buzatu Alina Ramona				
2.4 Anul de studiu	**I**	2.5 Semestrul	**II**	2.6 Tipul de evaluare	**Exam**	2.7 Regimul disciplinei	Conţinut[3)]	**DF**
							Obligativitate[3)]	**DI**

3. Timpul total estimat (ore pe semestru al activităţilor didactice)

3.1 Număr de ore pe săptămână	**4**	3.2 din care curs:	**2**	3.3 laborator:	**2**
3.4 Total ore din planul de învăţământ	**56**	3.5 din care curs:	**28**	3.6 laborator:	**28**
Distribuţia fondului de timp					ore
Studiul după manual, suport de curs, bibliografie şi notiţe					28
Documentare suplimentară în bibliotecă, pe platformele electronice de specialitate şi pe teren					14
Pregătire seminarii/ laboratoare/ proiecte, teme, referate, portofolii şi eseuri					10
Tutoriat					
Examinări (examen practic: 10 grupe x 1 ora; examen final: 2 serii x 1 ora)					12
Alte activităţi					

3.7 Total ore studiu individual	**64**
3.8 Total ore pe semestru	**120**
3.9 Numărul de credite[5)]	**4**

4. Precondiţii (acolo unde este cazul)

4.1 de curriculum	Knowledge of basic notions of general chemistry
4.2 de competenţe	Use of instruments, tools and analytical tehcniques in the chemistry laboratory

5. Condiţii (acolo unde este cazul)

5.1 de desfăşurare a cursului	• Audio-video equipment
5.2 de desfăşurare a seminarului/ laboratorului/ proiectului	• Specific reagents, glasware, materials, and instruments

6. Competenţe specifice acumulate

Competenţe Profesionale	**Knowledge aquired by the student during lectures:** • The students must become familiar with the fundamental concepts about the structure, properties, role and metabolism of main biomolecules: proteins, nucleic acids, carbohydrates, lipids, vitamins, enzymes, hydro-electrolyte and acid-base metabolism, signaling systems at the cellular and the whole organism level. Special emphasis must be put on the concepts of biochemistry of the oral cavity: the biochemical composition of the saliva and of the tooth and tooth-supporting tissues and also the metabolic processes which take place at these levels. **Knowledge aquired by the student during laboratory classes:** • From a practical point of view, students must acquire skills related to the use of equipment and tools in the biochemistry lab, the methods for separation and analytical techniques. Students must be able to use these acquired skills to determine and interpret the values of the most important biochemical parameters in investigating the mineral, carbohydrate, lipid and protein metabolism in the clinical laboratory.
Competenţe transversale	1. Constant preoccupation for professional advancement through critical thinking abilities acquired by actively participating in lecture and laboratory classes. 2. Efficient use of information, communication and professional advancement resources (internet portals, special software and databases, online courses, etc.).

7. Obiectivele disciplinei (reieşind din competenţele specifice acumulate)

7.1 Obiectivul general al disciplinei	The biochemistry lectures' main objective is the presentation, explanation and acquisition of fundamental concepts about the structure, properties, role and metabolism of main biomolecules: proteins, nucleic acids, carbohydrates, lipids, vitamins, enzymes, hydro-electrolyte and acid-base metabolism, signaling systems at the cellular and the whole organism level.
7.2 Obiectivele specifice	The special part of the lecture aims to present concepts of biochemistry of the oral cavity: the biochemical composition of the saliva and of the tooth and tooth-supporting tissues and also the metabolic processes which take place at these levels. From a practical point of view, students must acquire skills related to the use of equipment and tools in the biochemistry lab, the methods for separation and analytical techniques. Students must be able to use these acquired skills to determine and interpret the values of the most important biochemical parameters in investigating the mineral, carbohydrate, lipid and protein metabolism in the clinical laboratory.

8. Conţinuturi

8.1 Lectures	Metode de predare	Număr de ore	Observaţii
1. Proteins. Structure. Properties. Classification. Proteins used in clinical investigations	Oral transmission of information: PowerPoint , demonstration on blackboard Continuous interrelation with students by questions concerning the presented notions Answer to student questions	2	
2. Enzymes. General characteristics. Mechanisms of action. Enzyme kinetics. Classification. Uses in medicine.		2	
3. Vitamins. Water-soluble vitamins. Fat-soluble vitamins. Structure. Biochemical roles.		2	
4. Energetic metabolism. Obtainment and utilisation of energy in the body. Macroergic and microergic compounds. The Krebs cycle. The respiratory chain. Energy balance		2	
5. Carbohydrate metabolism. Glucose oxidation in anaerobiosys and in aerobiosys. Pentose phosphate pathway. Gluconeogenesis. Glycogen metabolism. Pathways of regulating carbohydrate metabolism		2	
6. Lipid metabolism. The metabolism of fatty acids. The metabolism of triglycerides. The metabolism of the ketone bodies.. The metabolism of cholesterol. Plasma lipoproteins. Pathways of regulating lipid metabolism		2	
7. Protein metabolism. The body's protein needs. The essential amino acids. The nitrogen balance. General metabolism of amino acids. The transamination. The ureogenesis. The metabolism of the nucleotides and of the chromoproteins		2	
8. Integrative metabolism. Energy metabolism in major organs. Metabolic interrelations		2	
9. Cell signaling systems. Essential notions. Types of signals. General		2	

mechanism of cellular transfer of hormonal information. Characterization and classification of hormonal substances. Hormones derived from amino acids. Peptide and protein hormones. Lipid hormones			
10. Biochemistry of the saliva. Synthesis. Composition. Properties		2	
11. Biochemistry of the saliva. Biochemical role. Practical aspects of the investigation of the salivary secretion		2	
12. Tooth biochemistry. The Enamel. The dentin. The cementum. The dental pulp. Biochemistry of the periodontal		2	
13. Biochemistry of the dental deposits: the plaque, the tartar		2	
14. Biochemistry of the dental caries		2	

Bibliografie obligatorie:

1. Cătălin Marian, Andrei Anghel, Edward Şeclăman, Adriana Kaycsa, Ioan Ovidiu Sîrbu, Liviu Tămaş, Biochemistry of Metabolism for medical students, 978-606-786-010-8, 2016
2. Martin Levine, Topics in Dental Biochemistry, Springer, 2011

Bibliografie facultativă:

1. Thomas M. Devlin, "Textbook of Biochemistry with Clinical Correlations", 7th Ed, Publisher John Wiley & Sons, 2010, ISBN: 978-0470281734
2. Gerhard Meisenberg, William H. Simmons, Principles of Medical Biochemistry, 3rd, Saunders Elsevier, 2012

8.2 Laboratory class	Metode de predare-învăţare	Număr de ore	Observaţii
1. Mineral metabolism. The determination of pH. The buffering capacity. The determination of the ions in biological fluids	Presentation of the theoretical and practical aspects (including PowerPoint) Student questioning on the described theoretical and practical notions. Practical implementation (execution) of the experiments by students. Calculus of the results Discussions and interpretation of the results.	2	
2. The investigation of the metabolism of calcium. Determination of the alkaline phosphatase		2	
3. Carbohydrate metabolism. The determination of glucose in body fluids. Glycemia and its regulation. Glucose tolerance test. Determination of glycosylated hemoglobin		2	
4. Carbohydrate metabolism. The determination of lactic and of pyruvic acids in body fluids. Pentose-phosphate pathway. Brewer Test. The determination of glucose-6-phosphate dehydrogenase		2	
5. Lipid metabolism. The investigation fatty acids and triacylglycerols in blood serum. The identification of ketone bodies in urine		2	
6. Lipid metabolism. Plasma lipoproteins. Determination of total cholesterol and HDL cholesterol in plasma lipoproteins		2	
7. Protein metabolism. The determination of haemoglobin and bilirubin		2	
8. Protein metabolism. The determination of serum transaminases		2	
9. Protein metabolism. The determination of serum and urinary urea. The determination of creatinine in serum and urine		2	
10. Hormonal investigations. The principle of the immuno-competition assays used in analysis. Hormonal determinations with implications in dentistry. The determination of the parathyroid hormone		2	
11. Biochemical investigation of the saliva. Determination of the salivary amylase		2	
12. Laboratory investigations in clinical diagnosis of metabolic diseases		2	
13. The metabolism of nucleic acids. The determination of uric acid in serum		2	
14. Practical examination		2	

Bibliografie obligatorie:

1. Anghel A., Kaycsa A., Narita D., Samoila C., Chemistry and Biochemistry Practical Works – Applications in Clinic Laboratory for the Medicine Faculties, Ed. EUROSTAMPA, Timisoara, 2009

Bibliografie facultativă:

1. Michael L. Bishop, Edward P. Fody, Larry E. Schoeff, Clinical Chemistry: Techniques, Principles, Correlations, 6th Ed., Lippincott Williams & Wilkins, 2009

9. Coroborarea conţinuturilor disciplinei cu aşteptările reprezentanţilor comunităţilor epistemice, asociaţilor profesionale şi angajatori reprezentativi din domeniul aferent programului

General biochemistry notions are essential for understanding the biochemical processes of the oral cavity (anatomical alterations are based on molecular/ionic modifications), as well as the physical and chemical properties of dental materials.

10. Evaluare

Tip activitate	10.1 Criterii de evaluare	10.2 Metode de evaluare	10.3 Pondere din nota finală
10.4 Curs	Lecture attendance is mandatory; max. 30% absences are allowed. Promoting the practical test is required.. *For a mark of 5:* basic knowledge of the subject matter. *For a mark of 10:* correct answer given to at least 90% of the questions.	Theory Exam - 50 multiple choice question tests in accordance with the methodology adopted by the Senate decision number 6/1908/27.02.2013.	50%
10.5 Laborator	Laboratory classes attendance is mandatory; max. 15% absences are allowed. *For a mark of 5:* the student's skills on the use of equipments and tools in the biochemistry lab, knowledge of the analytical methods, correct determination of biochemical analytes in biological fluids and/or other biochemical experiments *For a mark of 10:* the student's skills on the use of equipment and tools in the biochemistry lab, knowledge of the analytical methods, correct determination of biochemical analytes in biological fluids and/or other biochemical experiments; the students must obtain correct results and know how to interpret them in order to to achieve proper correlations with the lecture material for the interpretation of the results.	Continuous evaluation of the theoretical and practical knowledge during the semester. Practical examination in the last week of the semester: written examination and practical execution of an experiment.	10% 40%
10.6 Standard minim de performanță			
Knowledge of fundamental biochemistry notions, acquiring practical abilities regarding the use of specific tools and instruments in the biochemistry laboratory and understanding of the studied analytical techniques.			

Data completării	Semnătura titularului de curs Prof. Dr. Catalin Marian	Semnătura titularului de laborator/stagiu 1. Buzatu Alina Ramona
Semnătura șefului de disciplină Prof. Dr. Anghel Andrei		
Data avizării în departament	Semnătura directorului de departament Conf. Dr. Șeclăman Edward	

Notă:

1) Domeniul de studii - *se alege una din variantele:* Licenţă/ Masterat/ Doctorat (**se completează conform cu Nomenclatorul domeniilor şi al specializărilor/ programelor de studii universitare în vigoare**) ;

2) Ciclul de studii - *se alege una din variantele:* Licenţă/ Master/ Doctorat;

3) Regimul disciplinei (conţinut) - *se alege una din variantele:* **DF** (disciplină fundamentală)/ **DD** (disciplină din domeniu)/ **DS** (disciplină de specialitate)/ **DC** (disciplină complementară) - *pentru nivelul de licenţă;* **DAP** (disciplină de aprofundare)/ **DSI** (disciplină de sinteză)/ **DCA** (disciplină de cunoaştere avansată) - *pentru nivelul de masterat*;

4) Regimul disciplinei (obligativitate) - *se alege una din variantele:* **DI** (disciplină obligatorie)/ **DO** (disciplină opţională)/ **DFac** (disciplină facultativă);

5) Un credit este echivalent cu 25 – 30 de ore de studiu (activităţi didactice şi studiu individual).

6) Pentru specializările şi/sau disciplinele a căror tematică se regăseşte în bibliografia de rezidenţiat, aceasta devine obligatorie.