



DISCIPLINE GRID

1. Programme:

1.1.	CAROL DAVILA UNIVERSITY OF MEDICINE AND PHARMACY BUCHAREST
1.2.	FACULTY OF DENTISTRY / 3rd DEPARTMENT
1.3.	DIVISION: PHYSIOLOGY
1.4.	STUDY DOMAIN: Health, sectoral regulated within European Union
1.5.	STUDY LEVEL: LICENCE
1.6.	STUDY PROGRAMME: DENTAL MEDICINE IN ENGLISH

2. Discipline:

2.1.	DISCIPLINE NAME: PHYSIOLOGY II						
2.2.	LOCATION: Faculty of Medicine, 8 Eroilor Sanitari Blvd., 1st Floor, Sector 5, Bucharest						
2.3.	Lectures tenure: Daniela Gabriela Bălan – Associate Professor						
2.4.	Practical classes tenure: Daniela Gabriela Bălan – Associate Professor Andra-Elena Balcangiu-Stroescu – Teaching assistant						
2.5. Study year	I	2.6. Semester	II	2.7. Evaluation	Exam	2.8. Type of discipline	CD/FD

3. Estimated total time (hours/semester)

No. hours/week	4	out of which	Lectures: 14	Laboratory session: 14
Total hours out of learning schedule	56	out of which	Lectures: 28	Laboratory sessions: 28

Time distribution	hours
Textbook study, lecture support, bibliography and notes	28
Supplementary documentation activity in the library, on online platforms	10
Practical activity support material, homework, portfolio and essays	20
Tutorial activity	-
Examinations	3
Other activities	8
Total hours of individual study	69
Total hours per semester	125
Credits	5

4. Preconditions

4.1. curriculum	The student must have general knowledge of anatomy and physiology - high school level
4.2. proficiencies	-

5. Conditions

5.1. for lecture activity	Amphitheater (minimum 100 seats), computer, video projector. Interactive exposure of the material according to the analytical program, using multimedia resources, PowerPoint presentations, educational films.
5.2. for laboratory activity	Laboratory, specific materials and instruments for practical activities, computer, video projector. At each laboratory session there is a seminar on the subject of the lecture, the practical laboratory session is performed and students present a report.

6. Accumulated skills

6.1. Proficiencies (<i>knowledge and abilities</i>)	<p>I. Knowledge (cognitive dimension)</p> <ul style="list-style-type: none"> - acquiring the ability to explain the physiological mechanisms underlying the functioning of the organs, apparatus, and systems of the human body - description of the mechanisms of adaptation to different variations of the internal or external environment - knowledge of the functional mechanisms of the oro-facial system and its relationship with other organs, apparatus, and systems -acquiring a minimum of practical knowledge on laboratory techniques and the ability to interpret the obtained results and to establish the relationship between biological constants and the etiopathogenesis of oral and systemic diseases <p>II. Abilities (functional dimension)</p> <ul style="list-style-type: none"> - recognition and interpretation of deviations of normal biological functional parameters - clinical interpretation of functional parameters
6.2. Transversal skills (<i>role, professional and personal development</i>)	<p>III. Role skills</p> <ul style="list-style-type: none"> - concern for professional development - efficient use of information sources - ability to work effectively in a team - clear, rigorous communication of knowledge - development of basic biomedical scientific language <p>IV. Professional and personal development skills</p> <ul style="list-style-type: none"> - ability to use and correlate assimilated notions in a new context - ability to apply theoretical notions in medical practice - ability to establish interdisciplinary correlations

7. Objectives (based on the grid of acquired specific skills)

7.1. General Objective	- understanding how the human body works and adapts to changes in the internal and external environment
7.2. Specific Objectives	<ul style="list-style-type: none"> - adequate knowledge and use of the notions of physiology - knowledge of the functional mechanisms of the organs, apparatuses, and systems of the human body - knowledge of the specific way in which the oro-facial system works and understanding of the relations of this system with the other organs and systems

	<ul style="list-style-type: none"> - the ability to explain and interpret theoretical and practical contents related to the functioning of the human body, in an interdisciplinary manner - knowledge of functional mechanisms, as a basis for understanding human pathology and for correlating to morphofunctional aspects
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8. Content

8.1. Lectures	No. hrs/topic	Teaching method	Obs.
1. Respiration. Pulmonary ventilation, circulation and diffusion of oxygen and carbon dioxide. The ventilation/perfusion ratio. Transport of respiratory gases. Regulation of respiration.	2	<p>Interactive exposure of the material according to the analytical program, using multimedia resources, PowerPoint presentations and educational films. Systematic presentation and debate. Exemplification and clinical correlations.</p> <p>The content of the lecture is dynamic and according to the latest discoveries in the field.</p> <p>At the end of each lecture, discussions with the students regarding the presented material take place.</p>	
2. Ingestion of food -hunger and satiety. Dentition. Salivary glands. The roles of saliva. Mechanism of salivary secretion. Salivary reflex.	2		
3. Salivary acinar cells stimulations. The sense of taste. Mastication.	2		
4. Deglutition. Gastric secretion.	2		
5. Pancreatic juice secretion. Bile secretion. Secretions of the small intestine. Absorption in the gastrointestinal tract. Movements of the digestive system.	2		
6. Hormone secretion and mechanisms of hormone action. Pituitary gland and its relation to the hypothalamus.	2		
7. Thyroid hormones. Bone cells. Parathyroid hormones. Calcium and phosphate metabolism.	2		
8. Adrenal gland hormones. Adrenal medulla and adrenal cortex	2		
9. Secretion of the endocrine pancreas. Physiology of reproductive system.	2		
10. Physiology of the nervous system. Synaptic transmission. Properties of nerve centers. The special senses: olfaction, visual and acoustic perception. Pain and thermal sensitivity	2		
11. Cardiovascular physiology. Properties of cardiac muscle: automatism, excitability, conductivity, contractility. The factors that influence the properties of the heart.	2		
12. The law of the heart. Cardiac output. Hemodynamic - the characteristics of arterial circulation.	2		
13. Characteristics of capillary and venous circulation. Capillary fluid exchange, interstitial fluid, and lymph flow.	2		
14. Humoral and nervous regulation of cardiovascular function. Regulation of body function in the elderly and during physical exercise.	2		

8.2 Laboratory Sessions	No. hrs/topic	Teaching method	Obs.
1. Pneumographic recordings of respiratory movements. Pulmonary volumes and capacities recordings. Obstructive and restrictive lung disorders. Composition of alveolar and expiratory air.	2		

Student reports		At each laboratory session there is a interactive seminar on the subject of the lecture, the practical laboratory session is performed and students present a paper. Practical and theoretical applications (paraclinical and clinical investigations). Use of multimedia resources, didactic films and practical demonstrations.
2. Human energy requirements. Energetic and metabolic rate. Basal metabolic rate (BMR)—measurement, estimation, individual differences. Student reports	2	
3. Saliva collection, saliva composition, salivary flow, salivary pH. Study of salivary compounds mucin, thiocyanate, calcium, phosphorus - principle of determination, normal values and clinical significance. Salivary microscopic examination. Salivary amylase effects and the influence of temperature on the activity of salivary amylase. Student reports	2	
4. Gastric secretion assessment; collection of gastric juice, hydrochloric acid. Hydrochloric acid, and lactic acid - principle of determination, normal values and clinical significance. The effect of pepsin on hydrolysis of proteins. The chlorhydropeptic effect of the gastric juice on proteins. Enzymatic coagulation ok milk. Student reports	2	
5. Bile secretion assessment. Collection of bile secretion. Bile pigment and bile salts positive tests. The effect of bile salts on surface tension, emulsification of lipids, solubilization of cholesterol and fatty acids. Pancreatic juice assessment. Collection of pancreatic juice. Serum and urinary amylase - normal values and clinical significance. Urine amylase determination. Student reports	2	
6. Assessment of insulin secretion. Basal glycemia. Glucose tolerance test. Glucose in urine test. Calcium and phosphorus metabolism. Hypocalcemia signs. Student reports	2	
7. Cardiac automatism. Stanius ligatures experiment. Vagal stimulation effects on heart. Cardiac cycle. Student reports	2	
8. Auscultation of the heart and phonocardiogram. Radial and carotid pulse. Venous pulse. Apex shock. Student reports	2	
9. The normal electrocardiogram I. Electrocardiogram recording.Flow of current around the heart during the cardiac cycle. Electrocardiographic leads. Vectorial analysis. Student reports	2	
10. The normal electrocardiogram II. Analysis of waves, segments, and intervals of the electrocardiogram. Complete electrocardiogram analysis. Student reports	2	
11. Arterial circulation. Blood pressure measurement. The cold pressor test. Orthostatic blood pressure test. Effect of physical activity on blood pressure. Student reports	2	
12. Polysynaptic defense reflex. Monosynaptic myotatic stretch reflex. Electroencephalogram. Motor unit. Electromyogram. Student reports	2	
13. Discussions on practical exam topics. Absence recovery.	2	
14. Evaluation of the laboratory activity - practical exam	2	

8.3. Bibliography for lectures and laboratory/practical sessions

1. Guyton And Hall - Textbook Of Medical Physiology, Saunders, 14th Edition, 2020.
2. Walter Boron, Emile Boulpaep - Medical Physiology, Elsevier Health Sciences (2016).
3. Fiziologia aparatului respirator. Fiziologia aparatului reno-urinar. (pentru studenții Facultății de Medicină Dentară). Bălan Daniela-Gabriela, Balcangiu-Stroescu Andra-Elena, Stănescu Iulia-Ioana. Editura Medicală, 2018. ISBN: 978-973-39-0854-8.
4. Fiziologia sistemului endocrin. Bălan Daniela Gabriela, Piperea-Șianu Dan. Globe Edit, International Book Market Service Ltd, 2019. ISBN:978-613-9-41367-6.
5. Fiziologia sistemului digestiv (pentru studenții Facultății de Medicină Dentară). Bălan Daniela-Gabriela, Balcangiu-Stroescu Andra-Elena, Stănescu Iulia-Ioana, Piperea-Șianu Dan. Editura Medicală, 2019. ISBN:978-973-39-0858-6.
6. Fiziologia sistemului cardiovascular (pentru studenții Facultății de Medicină Dentară). Bălan Daniela-Gabriela, Balcangiu-Stroescu Andra-Elena, Stănescu Iulia-Ioana, Piperea-Șianu Dan. Editura Medicală, 2019. ISBN:978-973-39-0857-9.
7. Fiziologia sistemului nervos. Fiziologia sistemului endocrin (pentru studenții Facultății de Medicină Dentară). Bălan Daniela-Gabriela, Balcangiu-Stroescu Andra-Elena, Stănescu Iulia-Ioana, Piperea-Șianu Dan. Editura Medicală, 2019. ISBN:978-973-39-0858-6.

9. Corroborating the contents of the discipline with the expectations of epistemic community representatives, professional associations and employers in the fields representative for the program

Physiology is the link between the basic sciences and medicine, integrating the individual functions of all the body's different cells, tissues, and organs into a functional whole. The human body is much more than the sum of its parts. The main goal of the physiology teaching is to emphasize as accurate as possible the effectiveness of the body's homeostasis mechanisms. The course offers students the classic, fundamental notions of physiology and tries to create a perspective image on the functioning of the human body by synthesizing data belonging to other fundamental sciences, such as chemistry, anatomy, cell biology, embryology, histology. The content of the course is dynamic, permanently correlated with similar courses from the Faculties of Dental Medicine. It helps to understand normal and pathological biological phenomena and, therefore, plays a central role in the study of medicine and medical practice.

10. Evaluation

10.1 Evaluation			
Activity type	Evaluation Criteria	Methods of evaluation	% out of final grade
Lecture	<p>A. Knowledge for mark 5: - Basic degree of assimilation and knowledge of the notions of general and orofacial physiology, according to the analytical program.</p> <p>B. Additional knowledge for mark 10: - Very good accuracy of the notions presented in the lectures, assimilation and understanding. Good ability to apply and to correlate the knowledge acquired with those specific to other fundamental disciplines.</p>	<p style="text-align: center;">Exam</p> <p>The final exam consists of a: Exam grid - multiple choice questions. Participation in the final exam is conditioned by passing the practical exam.</p>	80%

Laboratory Sessions	A. Knowledge for mark 5: - Understanding the basic aspects, essential for future doctors and useful in the practice of dentistry, knowing the normal and pathological limits of paraclinical tests. - Presentation of papers in seminars and participation in student scientific sessions B. Additional knowledge for mark 10 -Very good knowledge of the studied functional, regulation and integration mechanisms; correct interpretation of test results; clear and correct communication of knowledge	<p style="text-align: center;">Practical assessment</p> Periodic evaluation of the student through seminars and tests during the semester. The practical exam is a written/oral exam.	20%
Minimum performance standards			
According to the analytical program, elementary knowledge and understanding of the main physiological mechanisms that allow the body to functioning as a whole. Knowledge of the basic functioning mechanisms of the orofacial system.			

Date:
07.09.2023

Chair of Physiology Division,
Associate Prof. Bălan Daniela-Gabriela

Date of the approval in Department Board:

Department director,
Prof. Bodnar Dana-Cristina