

DISCIPLINE'S FILE

1. Data about study programme

1.1 University	UNIVERSITY OF MEDICINE AND PHARMACY "VICTOR BABEȘ" TIMIȘOARA
1.2 Faculty	FACULTY OF DENTAL MEDICINE
1.3 Department	III Functional Sciences
1.4 Domain of studies	Licence
1.5 Cycle of studies	Licence
1.6 Study programme/Qualification	Dental Medicine

2. Data about discipline

2.1. Discipline's name	General Physiology and physiology of the stomatognathic system							
2.2 Lectures holder	Prof. Dr. Gabriela Tanasie							
2.3 Laboratories holder	1. Asist. Dr. Gotia Smaranda Laura 2. Asist. Dr. Georgescu Marius 3. Asist. Dr. Kundnami Rajpal Nilima							
2.4 Year of study	I	2.5 Semester	I + II	2.6 Evaluation type	Exam in IInd semester	2.7 Discipline's regimen	Content	DF
							Compulsoriness	DI

3. Total estimated time (hours per semester of teaching activities):

Ist SEMESTER

3.1 Hours/week	4	3.2 from which: Lectures	2	3.3 laboratories	2
3.4 Total hours from teaching plan	56	3.5 from which: Lectures	28	3.6 laboratories	28
Time distribution					hours
Study from book, course support, bibliography, notes					50
Additional documentation in the library, on the specialized electronic platforms and on the field					10
Training seminars / laboratories / projects, themes, papers, portfolios and essays					14
Tutoring					-
Exams (1 mid term test, 1 partial exam)					3
Other activities					-
3.7 Hours of individual study	74				
3.8 Total hours per semester	133				
3.9 Credits number	5				

IInd SEMESTER

3.1 Hours/week	3	3.2 from which: Lectures	1	3.3 laboratories	2
3.4 Total hours from teaching plan	42	3.5 from which: Lectures	14	3.6 laboratories	28
Time distribution					hours
Study from book, course support, bibliography, notes					25
Additional documentation in the library, on the specialized electronic platforms and on the field					5
Training seminars / laboratories / projects, themes, papers, portfolios and essays					14
Tutoring					-
Exams (1 practical exam, 1 final exam)					3
Other activities					
3.7 Hours of individual study	44				
3.8 Total hours per semester	89				
3.9 Credits number	3				

4. Prerequisites (if it is the case) -

4.1 curriculum	Anatomy, Biophysics, Biochemistry, Cell and molecular biology
4.2 skills	

5. Conditions (if it is the case) -

5.1 Lectures (courses)	<ul style="list-style-type: none"> The attendance at the course is mandatory, with a maximum of 30% of the total absences being accepted. Mobile phones will be closed during classes, telephone conversations are not tolerated during the course, nor do students leaving the classroom for personal phone calls; It will not be tolerated the delay of students in the course as it proves to be disruptive to the educational process; The date of the mid-term test is announced at the beginning of the semester. Applications for postponement will not be accepted for reasons other than a legitimate objective;
5.2 Laboratories	<ul style="list-style-type: none"> The attendance at practical works is compulsory, with a maximum of 15% of the total absences being accepted; Recovery is allowed up to 15% of the total number of paid absences in the fifth week of the semester (except for medical cases that will require individual approval from the Dean's office). Mobile phones will be closed throughout the lab, with no telephone conversations being tolerated during the lab nor students leaving the classroom to take personal phone calls; It will not be tolerated the delay of students as it proves disruptive to the educational process; Practical exam will be held in the last week of the semester or in the regular session, from the previously announced topic of the practical works / laboratories

6. Specific skills acquired

Professional skills	<p>The knowledge gained from the course allows:</p> <ol style="list-style-type: none"> 1. Proper use of terminology in the field of human physiology 2. Understanding of the regulation mechanisms of the cardio-vascular, respiratory, renal, digestive, endocrine apparatus and the correlation of those with the activity in the dental cabinet; 3. Integrated presentation of the physiology of the oro-facial system in the general homeostasis of the body, integration of the theoretical notions of physiology with medical practice. 4. Understanding of the mechanisms of salivary secretion, saliva roles and the importance of salivary secretion for oral homeostasis as well as for the whole body functions 5. Knowing the mechanisms of dental eruption, the structure and functions of each group of teeth, the roles of nutrition, vitamins, hormones on the dental structures 6. Evaluation of the calcium sources, calcium and fluorine functions in the body, mechanisms of regulation of phosphocalcic metabolism 7. Understanding the functions of the tongue, the roles of the taste and smell sense in the general economy of the human body 8. Knowing the main stages and the nervous control of the mastication; to evaluate the functional importance of the mastication for the dento-maxillary system and for the whole body 9. Describing the stages and regulation mechanisms of swallowing, the particularities of age-dependent swallowing, the role of suckling for the dento-maxillary structures. <p>The knowledge gain from laboratories allows:</p> <ol style="list-style-type: none"> 1. Understanding of the integration of theoretical notions of physiology with medical practice and experiments of virtual physiology 2. Assessing of the normal values of blood, kidney, respiratory, cardiovascular parameters 3. Measuring the blood pressure values and understanding the importance of the values of blood pressure for the dentist 4. Assessment of the physical and chemical parameters of salivary secretion in correlation with oro-facial lesions 5. Preparing a diagram as a model of a physiological nutrition 6. Improvement of handling biological products: blood, saliva, urine 7. Practical performing of bleeding time, masseter reflex, Chwostek test and explaining their importance for the dentist practice
Transversal skills	<ol style="list-style-type: none"> 1. Concerning for professional development by engaging critical thinking skills demonstrated through active participation in the course and laboratories; 2. Involvement in scientific research activities by participating in the elaboration of papers, studies, articles; 3. Effective use of information sources and communication resources and assisted training (Internet portals, specialized software applications, databases, on-line courses, etc.)

7. Discipline's objectives (based on the specific skills accumulated) -

7.1 General objective	Physiology lectures and practical laboratories have the following main objectives: to present and explain the basal functions of cell membrane, skeletal and smooth muscle fibers, neuronal cells, all organs and systems within human body, to discuss basic principles of patho-physiology, to present and explain the mechanisms of neural, humoral and endocrine regulation.
7.2 Specific objectives	Knowledge and understanding of the physiology of the stomatognathic system to integrate the physiology of oro-facial system in general body homeostasis, to integrate the theoretical concepts of physiology with medical practice.

8. Contents

8.1 Lectures	Teaching methods	Hours	Observations
Ist SEMESTER			
GENERAL PHYSIOLOGY Membrane's Physiology: functional structure of membrane, passive and active transport. Ionic channels. Membrane's carrier proteins. Membrane receptors. G proteins.	The lectures are presented as power point presentations, including images, tables and explanatory schemes, even some animations which simulated the development of physiological processes into the human body. Interactive discussion about the impact of physiologic mechanisms in dentistry practice.	2	
Lecture 2 Neuron's physiology. The resting and the action neuronal potential. Excitability and neuronal conduction function. The synapse physiology.		2	
Lecture 3 Striated skeletal muscle fiber physiology. Functional structure and contraction mechanism of striated muscle. Regulating and control systems of the body functions. Elementary reflex activity.		2	
Lecture 4 BLOOD PHYSIOLOGY Hydro-electrolytic balance. Blood volume. Circulating blood and blood's deposits. Regulation of blood volume. Composition of plasma. Acid-base balance		2	
Lecture 5 Erythrocytes: morphological, and functional structure. Substances required for erythropoiesis. Physiological hemolysis. Erythrocytes' roles. Erythropoiesis regulation		2	
Lecture 6 Physiology of leukocytes. Leukopoiesis: steps, regulation. Granulocytes' properties and function. Physiology of monocyte-macrophage system. Roles of lymphocytes. Platelets physiology. Physiology of hemostasis. Primary hemostasis. Blood clotting factors. Mechanisms of blood coagulation. Anti-clotting mechanisms. Fibrinolysis		2	
Lecture 7 CARDIOVASCULAR PHYSIOLOGY Fundamental myocardial properties. Cardiac automatism. Myocardium excitability. Conduction function of the myocardium.		2	
Lecture 8 Cardiac cycle. Ventricular systole and diastole. Phonocardiogram. Electrocardiogram		2	
Lecture 9 Cardiac output. Physiology of coronary circulation. PHYSIOLOGY OF CIRCULATION. Physiology of arterial circulation. Blood pressure. Physiology of microcirculation. Physiology of venous and lymphatic circulation		2	
Lecture 10 Cardiovascular regulation: cardiovascular centers, role of reflexogenous areas. Role of sympathetic and parasympathetic innervation. Nervous control of blood pressure: pressor and depressor reflexes. Humoral factors.		2	
Lecture 11 RESPIRATORY PHYSIOLOGY: Airways physiology.		2	

Physiology of pulmonary ventilation. Gases diffusion through the respiratory membrane and to the tissues. O ₂ and CO ₂ transport. Regulation of respiration			
Lecture 12 KIDNEY PHYSIOLOGY: Functional organization of the kidneys. Glomerular filtration. Renal tubules functions. Renal control of acid-base balance and hydro-electrolytic balance.		2	
Lecture 13 ENDOCRINE PHYSIOLOGY: Endocrine hypothalamus. Anterior and posterior pituitary gland. Thyroid hormones. Adrenocortical hormones		2	
Lecture 14 Sexual hormones. Endocrine pancreas. Blood glucose regulation.		2	
IInd SEMESTER			
Lecture 1 PHYSIOLOGY OF DIGESTION. Gastric secretion: composition, mechanisms of synthesis, role, regulation of gastric secretion.		1	
Lecture 2 Bile secretion: composition, synthesis mechanisms, roles.		1	
Lecture 3 Exocrine pancreas secretion: composition, synthesis mechanism, roles, regulation of pancreas secretion. Intestine secretion.		1	
Lecture 4 Intestinal absorption. Gastro-enteric motility. Vomiting. Physiology of large intestine.		1	
Lecture 5 PHYSIOLOGY OF STOMATOGNATHIC SYSTEM. PHYSIOLOGY OF ODONTO – PARODONTIUM. Physiology of teeth. Teeth development. Teeth eruption. Chemical composition of teeth - physiological overtones. Morphological and functional structure of teeth.		1	
Lecture 6 Gum and parodontium physiology. The role of diet, vitamins and hormones on oral cavity structures.		1	
Lecture 7 Physiology of calcium and phosphate metabolism. Calcium distribution within the body. Calcium and phosphate intestinal absorption. Calcium and phosphatedischarge. Hormones that regulate the calcium and phosphate equilibrium. Bone physiology. Fluoride's phisology.		1	
Lecture 8 PHYSIOLOGY OF ORAL CAVITY ENVIRONMENT. Salivary secretion. Saliva's production mechanism. Saliva's properties and composition. Salivary hormones. Roles of saliva.		1	
Lecture 9 Regulation of saliva secretion. Dysfunctions in saliva		1	

secretion. Adaptation of saliva secretion. Physiology of crevicular liquid. Physiology of teeth plaque. Dental tartar. Halitosis.			
Lecture 10 OROFACIAL SENSITIVITY. Oral cavity as a reflexogenous area. Tactile and thermal sensitivity (general and orofacial). Physiology of trigeminal nerve.		1	
Lecture 11 General and orofacial pain sensitivity. Pain modulation. Ascending pathways and cortical projection of orofacial sensitivity. Physiology of parietal lobe. Olfaction.		1	
Lecture 12 The sense of taste. THE PHYSIOLOGY OF THE STOMATOGNATHIC SYSTEM MOTOR ACTIVITY The physiology of tongue.		1	
Lecture 13 Physiology of mastication: masticator muscles tone. Stages and regulation of mastication. The functional value of mastication.		1	
Lecture 14 Physiology of deglutition. The suckling. Phonation and speech physiology. Frontal lobe physiology. The motor cortex and the descendent pathways for orofacial system.		1	
Required bibliography: <ol style="list-style-type: none"> 1. Lectures notes in ppt/pdf format 2. Guyton AC, Hall JE, W.B. Saunder , Medical Physiology, ed. XII, 2011 Optional bibliography: <ol style="list-style-type: none"> 1. Silbermagl S., Despopoulos A., Color atlas of physiology, 6th edition, Thieme Ed., 2008 2. Fox S., Human Physiology, 13th edition, 2012 			
8.2 Laboratories	Teaching methods	Hours	Observations
Ist SEMESTER			
1. SIM MUSCLE. Contraction of skeletal muscle. Single twitch. Tetanus. Interpretations. SIM MUSCLE. Muscle contraction. Secuse. Tetanus. Interpretations. SIM NERV. Recording of neuron potential.	<ul style="list-style-type: none"> • The use of virtual physiology programs for study the fundamentals of cell physiology (SimMuscle, SimNerve) • Laboratory measurements (e.g. O-A-B blood-typing, hemostasis tests, salivary flow, etc.) performed by each student • Physiological parameters measurements (e.g. blood pressure) performed by each student • Interpreting the results of laboratory tests and functional explorations to investigate the mechanisms 	2	
2. Plasma proteins : main fraction of plasma proteins, oncotic pressure, ELFO		2	
3. Exploration of red blood cells. Determination of hematocrit. Measurement of hemoglobin concentration.		2	
4. Exploration of white blood cells. Leucocytic formula. Interpretations. ESR.		2	
5. Blood groups: O-A-B and Rh. Blood transfusion.		2	
6. Hemostasis exploration: bleeding time, coagulation time, Howell time, and Quick time. The importance of hemostasis exploration for dentists.		2	
7. SIM HEART. Periodic inexcitability of the heart. The action of ions, chemical mediators and vagus nerve stimulation on heart properties.		2	

8. Blood pressure determination. The importance of blood pressure evaluations in the dentistry office.	contributing to the body homeostasis • Presentation and demonstration by diagrams and tables of functional exploration methods used in assessing the normal function of systems and apparatus	2	
9. ECG: genesis, recording, waves, segments and intervals analysis.		2	
10. ECG: Interpretation (rhythm, heart rate, axis calculation)		2	
11. Phonocardiogram. Peripheral circulation (arterial pulse, oscillometry).		2	
12. Spirometry. Ventilometric parameters		2	
13. Chemical and physical urine examination. Functional exploration of the endocrine pancreas		2	
14. Revision and practical lessons recoveries.		2	
IInd SEMESTER			
1. Principles of physiologic nutrition: Energy requirements of the body. The energetic content of nutrients. The importance of aliments on dento-maxilar apparatus.		2	
2. The functional exploration of gastric secretion.		2	
3. Hepatic and biliary pathways functional exploration.		2	
4. Functional exploration of exocrine pancreas. Blood amylase measurement. Urinary amylase concentration.		2	
5. Functional exploration of calcium and phosphate metabolism.		2	
6. Exploration of salivary secretion: saliva harvesting. Determination of salivary flow and its significance for dentists. Salivary measurements in dentist's office.		2	
7. Exploration of salivary secretion: saliva's buffer capacity, salivary pH determination, salivary sediment.		2	
8. Exploration of salivary secretion: saliva's major components determination. The action of salivary amylase on starch.		2	
9. Electromyography (EMG). Nerve conduction velocity.		2	
10. Recording of mandible's movements. EMG of orofacial muscles.		2	
11. Exploration of the sense of taste.		2	
12. Exploration of vision and sense of hearing. Fatigue test. Reaction speed determination.		2	
13. Nervous reflex activity. Measurement of tactile sensitivity threshold. Functional exploration of the trigeminal nerve		2	
14. Revision and practical lessons recoveries.		2	

Required bibliography:

1. Laboratories protocols - pdf
2. Paunescu V, Bunu C et al., **Physiology. Experiments and Demonstrations**; Ed. Orizonturi Universitare, 2002

Optional bibliography:

9. Corroborating the contents of the discipline with the expectations of representatives of the epistemic communities, professional associations and representative employers in the field of the program

Course curriculum and practical work of general physiology and physiology of the stomatognathic system ensures the acquisition of specific vocabulary for the dentist, assures the understanding of the mechanisms of functioning and regulation of the body, as well as of the dental system, integrated in the general homeostasis of the body. Theoretical and practical knowledge with useful references for the future workplace will allow the complex approach to treatment of lesions in the oral and facial area in correlation with the general pathology of the patient. (e.g. any bleeding intervention in the dental area requires correlation with the physiology of hemostasis)

10. Evaluation -

Activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 % from final mark
10.4 Lecture	<p><i>Minimal knowledge for mark 5:</i> 50% correct answers</p> <p><i>Knowledge for mark 10:</i> 90% correct answers</p>	<p><i>Ongoing evaluation:</i> Mid-semester test (1st semester) from the chapters: General physiology, Blood physiology, Cardio-vascular physiology, Respiration physiology – MCQs test</p> <p><i>Final evaluation:</i> Written exam comprising: - 100 multiple choice questions (50 MCQ for each semester) - Partial (interim) test: after the 1st semester, 50 MCQ</p>	<p>10%</p> <p>50%</p>
10.5 Laboratories	<p><i>Minimum knowledge for mark 5:</i></p> <ul style="list-style-type: none"> - Methods' principle; - Description of practical methodology; - Physiological limits. - Definition of the phenomenon; - Physiological mechanism involved in phenomenon production <p><i>Knowledge for mark 10:</i></p> <ul style="list-style-type: none"> - General regulatory mechanisms; - Description of practical methodology; - Physiological limits; physiological variations; - Bulletin interpretation; - Clinical significance. 	<p><i>Final evaluation:</i></p> <ul style="list-style-type: none"> - Practical exam: performing / description of a practical activity/maneuver; assessment of an analysis or functional exploration bulletin. 	40%

10.6 Minimum performance standard -
<p>Knowledge of terminology and understanding of mechanisms of functioning and regulation of internal environment, cardiovascular system, kidney, respiratory, endocrine, digestive, nervous system.</p> <p>Functional integration of stomatognathic system into the general homeostasis of the body.</p> <p>Recognition of pathological changes in the stomatognathic system.</p>

Date	Course holder	Laboratories holders
29.10.2018	Prof. dr. Gabriela Tanasie	1. As. Dr. Smaranda Laura Gotia 2. As. Dr. Marius Georgescu 3. As. Dr. Nilima Kundnami Rajpal
Discipline coordinator: Prof. Dr. Carmen Panaitescu		
Date of Department approval 30.10.2018	Department Director Prof. Dr. Paunescu Virgil	