DEN 2003 - Biological Bases of Disease II

Course title	Code	Semester	Type of course	Course structure and volume (hours)			ECTS
Biological Bases of Disease II	**DEN 2003**	**III**	**Mandatory**	**LECT**	60	180	**6**
				SEM	41		
				TCE			
				TSE	8		
				LAB	4		
				BL.EX.	2		
				FINAL EX.	2		
				INDEP. WORK	63		

Faculty, the educational program and level of education	School of Dental Medicine One cycle (5-years duration) Higher Educational program "Dentistry"
Faculty Member	**Leila Akhvlediani-**Professor, Doctor of Biology Mob.tel: 593537072, +995422212535; E-mail: Leila.akhvlediani@bauinternational.edu.ge **Giorgi Javakhishvili**-Invited Lecturer, MD Mob.tel: e-mail: george.javakhishvili@bauinternational.edu.ge **Giorgi Chilingarashvili**-Invited Lecturer, MD Mob.tel: 551459943; e-mail: giorgi.chilingarashvili@bauinternational.edu.ge **Tamta Chkheidze**- Invited Lecturer Mob.tel: 599001538; e-mail: chkheidze.tamta@bauinternational.edu.ge **Akaki Ivanishvili**- Assistant Professor, Invited Teacher 595311303/ akaki.ivanishvili6@bauinternational.edu.ge **Natalia Dachanidze** – Invited Lecturer, Doctor of Biology Mob.tel: 598 117 128; E-mail: natalia.dachanidze@bauinternational.edu.ge **Giorgi Nikolaishvili**- Invited Lecturer, MD, PhD Mob.tel +995 98 16 26 03 E-mail Giorgi.nikolaishvili@bauinternational.edu.ge Personal one-to-one consultation can be arranged at an agreed upon date and time
Duration	8 weeks
Prerequisite	MED1001-1008

Aim	The main goal of the module is to give the student advanced knowledge about pathophysiological mechanisms of blood diseases caused by damage of erythrocytes, leukocytes and thrombocytes and the malfunction of hematopoiesis. The main steps of various types of coagulation disorders will be revealed to the student. Discussion of pathophysiologic and pathologic characteristics of blood cancers, methods of laboratory diagnosis of cancers, hematological and coagulation indices and correct interpretation of the results will take place in this block. Students will be able to get a General knowledge of pathology of some systems including: Cardiovascular system and its related disorders, GI tract, General pathology of the Pancreas and the Kidney. In addition, will be given information about main chemotherapy medications used in treatment of blood cancers, their mechanism of action with explanation of side effects. Throughout the module, students will also learn about bacteria and fungi which are related to oral cavity and immune defense mechanisms against them; Role of streptococci and staphylococci in caries; role of plaque bacteria in periodontal diseases; some gram positive and gram negative rods. Students will study hypersensitivity reactions and the clinical importance of it. Students will be familiar with first aid manipulation which should be done in case of bleeding.
Methods of Teaching/Learning	Lecture, Seminar, Laboratory work, PPT Presentation, Problem based learning-PBL
Assessment System and Criteria	The knowledge of the student is evaluated by 100 point-based evaluation system out of which 20 score is allocated for the current activity, 40 point for block exam and 40 points for the final exam. **1. Current activity - 20 points, including the following:** ● PBL -10 points; ● Presentation -5 points; ● Laboratory -5 points; **PBL Tutorial assessment criteria -10 points** <u>Tutor</u> 1. Participation and communication skills -2 points 2. Cooperation and team building skills-2 points 3. Self-directed learning skills-2 points 4. Applying knowledge and information gathering skills-2 points 5. Clinical reasoning and decision making skills-2 points 2 points | 1 point | 0 points Excellent | Average | Poor **Presentation assessment criteria (5 points):** Two integrated presentations should be done. Presentation assessment score will be calculated as an average of two presentations. 1. Demonstrations of theoretical knowledge - 3 points (will be calculated as an average of all subjects): ● Subject A - 3 point; ● Subject B - 3 point; ● Subject C - 3 point; 2. Academic level and design - 1 point; ● Visual and technical quality of the material - 0,5 point;

- Review of the available modern material related to the topic - 0,5 point;

3. Presentation and communication skills - 1 point;
   - Debating and listening culture - 0,5 point;
   - Correct language and style - 0,5 point;

Laboratory work assessment (Laboratory assignment) (5 points)

Final score for laboratory work assessment will be calculated as an average of all laboratory works of all subjects.

Evaluation criteria:

5 points: Laboratory method is properly planned, the student uses correctly the tools and equipment in the laboratory, is able to make a record of the method, can easily detect the error and plan the way for its correction. The student is able to analyze and interpret the results of investigation. The laboratory work is done accurately, timely and thoroughly. Provides written Lab report in the required form (when necessary).

4 points: The laboratory method is properly planned, the student has the proper knowledge in laboratory equipment, is able to make a record of the method, can easily detect the error and plan the way for its correction but it is difficult to analyze the results. The laboratory work was carried with minor faults. Provides written Lab report in the required form (when necessary).

3 points: The laboratory method is properly planned, the student cannot show adequate knowledge of tools used in the laboratory, using the equipment makes a few mistakes, is able to make a record of the method, but cannot detect mistakes, and therefore, it is hard to find ways to correct them. Laboratory work was carried out with faults. Provides incomplete written Lab report (when necessary).

2 points: There are the slight mistakes in the planning method, the student could not show proper knowledge of laboratory tools and equipment used in the method, but cannot detect mistakes, and therefore, it is hard to find ways to correct them. Laboratory work was with the essential faults. Provides incomplete written Lab report (when necessary).

1 point: There are substantial errors in the planning of laboratory methods, the student is not familiar with the use of laboratory equipment, tools and rules, the method can be recorded, but cannot overlook mistakes, and therefore hard to find ways to fix. The laboratory work was with the essential faults. The lab report is not provided.

0 points: The student does not know the method, laboratory tools and equipment. Work is not done.

2. Block Exam - 40 points;

The exam is conducted in a test-based form (Multiple Choice Questions - MCQ). The test includes 100 questions and the value of each is 0,4 points. The highest possible score is 40. A Block exam is passed in case of 40% of each subject's questions are answered.

3. Final Exam - 40 points

Final exam is conducted in an combined form:

a) an oral form: the questions will be integrated. Each exam set will consist of 2 topics, each scored at maximum 10 points.
b) Written form: 2 cases each scored at maximum 10 points.

Integrated oral exam assessment criteria (10 points)

During the integrated oral exam, will be assessed complex knowledge from the following learning courses: immunology, biochemistry, pathology, topographic anatomy, medical microbiology, pharmacology, radiology.

10-9 points- the answer is comprehensive. The student is fluent in using information within the proposed task. The topic presented completely deep, at the required level with the correct use of medical terminology. The student demonstrates the ability to analyze and synthesize data while answering questions

8-7 points- The student has answered on all questions, but independent thinking ability is not clearly visible. The topic presented on the proper level, with the correct use of medical terminology. He/she has learned the main literature.

6-5 points- The answer is incomplete. The knowledge within the discussed topic is at moderate level. The answer lacks thinking ability and is mainly based on memorizing, terminology is barely used. During the response, a few errors can be detected.

4-3 points- The answer is incomplete. The knowledge within the discussed topic is at low level. The material is poorly presented. The student masters the main literature on insufficient level. During the response, a few errors can be detected.

2-1 point- Student's answer is not complete. The terminology is not used or is wrong. The answer is mainly erroneous. The topic is presented in fragments.
0 point- The answer does not correspond to the question or is not presented at all

Final exam case assessment criteria -10 points

1. Ability of case interpretation - 2 points;
2. Ability of using additional sources - 2 points;
3. Ability of applying theoretical knowledge - 2 points;
4. Ability of correlating normal and pathological conditions - 2 points;
5. Ability of drawing conclusions – 2 points.

The Prerequisites for Final Exam are:

- Prerequisite for Final Exam is the situation when at least 30% of the current assessment level is achieved.
- At least 30% (minimum 12 points from 40) of the Block Exam score is achieved.

The exam is considered being passed by the student if she/he receives **50% or more** out of the highest evaluation of the exam (40X50/100=20 points). When the total evaluation of the student (current evaluation + block exam evaluation+final exam evaluation) is more that 40 but less than 51 points, even though the exam grade threshold is passed, the learning course is considered not being covered and the student is given the right to exam retake during the additional examination period.
If the final evaluation for the Block, after taking the additional exam, (current evaluation + block exam's evaluation final exam evaluation) is less than 51%, the Block is not considered covered and it must be taken again.
In summary, the student is awarded the credit in case he/she accumulates minimum 51% out of 100%.
Positive scores:
(A) Excellent- 91 or more points;
(B) Very Good- 81-90 points;
(C) Good- 71-80 points;
(D) Satisfactory- 61-70 points;
(E) Enough- 51-60 points;

Negative scores:
(FX) Failure - 41-50 points: the student needs more independent work and is granted a single attempt of exam retake;
(F) Fail - 40 points or less: the student's conducted work is not sufficient and needs to take the course again. The student can take the additional exam during the same semester.

After the results of final exams are available, students with FX assessment have a right to retake an exam during an additional exam week in the same semester.

	An interval between a final and a corresponding additional exam must be at least 5 days after the results of a final exam become available
The core literature	***Pathology*** 1. **Robbins Basic Pathology-**Vinay Kumar; Abul K. Abbas; Elsevier; 10th. ed. 2018 2. **Elsevier's Integrated Pathology-** King C. Thomas; Mosby Elsevier; 2007; 3. **Robbins and Cotran Pathology Flash Cards-Edward Klatt; Richard Mitchell; Saunders Elsevier; 2nd ed.2016** ***Immunology*** 4. **Cellular and Molecular Immunology-** Abbas, K. Abul; Elsevier Sounders; 8th.ed. 2015. 5. **Lippincott Illustrated Reviews Flash Cards: Immunology-Deborah Lebman; Wolters Kluwer; 2016.** ***Topographic Anatomy*** 6. **Clinically Oriented Anatomy**- Moore, Keith L; Wolters Kluwer; 8th.ed. 2018; ***Medical Microbiology*** **7. Marsh and Martin's Oral Microbiology;** Philip D. Marsh; Michael A.O. Lewis; 6th edition, 2016 **8. Oral Microbiology at a glance;** Richard J. Lamont; Howard F. Jenkinson; 2010 ***Pharmacology*** **9. Basic & Clinical Pharmacology: A lange medical book-** Katzung, Bertram G; Mc- Graw Hill Education. 14th. ed; 2018. 10. Pharmacology Flash Cards-George Brenner; Elsevier; 4th ed. 2018 ***Biochemistry*** **11.Biochemistry: Lippincott's illustrated Reviews-** Ferrier Denice R; Wolters Kluwer; 7th ed. 2017. **12. Color Atlas of Biochemistry-**Jan Koolman; Klaus-Heinrich Roehm; Thieme; 3rd.ed. 2013; **13. Lippincott's illustrated Reviews Flash Cards : Biochemistry-Ferrier Denice R; Wolters Kluwer; 2015.** ***Radiology*** **14. Grainger & Allison's diagnostic radiology: A textbook of medical imaging-**Andy Adam; Churchill Livingstone; 6th ed; 2015 **15. Introduction to Radiologic imaging sciences & patient care**-Arlene M.Adler;Richard R.Carlton; Elsevier Saunders; 6th ed; 2016; ***Clinical skills- Nursing skills*** **16. clinical Nursing skills & techniques**- Anne Griffin Perry, Patricia A. Potter; Elsevier Mosby; 8th ed;2014 **17. Taylor's Clinical Nursing Skills: a nursing process approach**-Pamela Lynn; Wolters Kluwer ;4th ed.; 2015
The auxiliary literature	1. **Introduction to Pharmacology-**Mary K.Asperheim;Justin Favaro**.** Elsevier Sounder. 12th. ed; 2012; 2. **Essentials of Medical Pharmacology-**KD Tripathi. Jaypee Brothers Medical Publishers; 5th.ed. 2003. 3. **Roitt's Essential Immunology**- Peter J. Delves, Seamus J; Wiley –Blackwell. 12th.ed. 2011. 4. **Medical Microbiology**: **A guide to microbial infections: Pathogenesis, Immunity, Laboratory Diagnosis and Control-** David Greenwood;Mike Barer; Churchill Livingstone;18th.ed. 2012;

Learning Outcomes

NQF*	COURSE LEARNING OUTCOMES	PROG. LO	LECTURE	SEMINAR	LAB	TEACHING IN SIMULATION	TEACHING IN CLINIC	BLOK/MIDTERM EX. I	BLOK/MIDTERM EX. I I	FINAL EXAM	ASSESSMENT METHODS
KNOWLEDGE AND AWARENESS	• Describes the pathophysiological and cytopathological peculiarities of diseases caused by damage of blood cells and malfunction of hematopoiesis. • Have basic information about disorders of Cardiovascular system; • Explain pathological mechanisms of Anemias, Coagulopathy, Disseminated intravascular coagulation; Non-neoplastic disorders of white blood cells Thrombocyte disorders; Hemodynamic disorders and Blood cancers;	5.1 5.2	x	x	x	x		x	x	x	PBL PPT LAB work MCQ integrated oral exam

	• Explains different types of coagulation disorders and their laboratory diagnostics • Knows main information about etiology, epidemiology, classification, pathogenesis, diagnosis of blood cancers and can name main chemotherapy medications for it's treatment. • Knows main information about pathology of disease of oral cavity and diseases of salivary glands; General pathology of esophagus; stomach (gastritis, peptic ulcer, herniations); small and large intestines, exocrine pancreas diseases; Diabetes mellitus; thyroid and parathyroid glands and kidney. • Knows beneficial effects of bacterial colonizers; • Can link S. mutans with dental caries; identifies Important bacteria in caries; • Explains the role of plaque bacteria and host factors in periodontal diseases; • Compares microorganisms associated with Gingivitis, Chronic periodontitis and localized aggressive periodontitis and endodontic infections; • Knows fungi which cause oral infections, such as Denture stomatitis, Angular cheilitis and Gingivitis and periodontal disease; • Defines the topographic anatomy of perineal region • Recognises Latin terminology together with English anatomical terms;										

SKILL	• Recognizes normal anatomical structures on X-ray. • Identifies main blood cancers under the microscope • Searches for relevant information effectively, manages information, has capacity for organizing and planning (including time management during lab work), at the end of work makes a report with the proper conclusions in written or verbal form. • Can provide first aid in case of bleeding • Able to become a full-fledged member of the team created to review the task from different angles • Listens to others and understands the different positions of group mates.	6.1 11.3 11.5		**x**	**x**	**x**				**x**	**PBL, PPT** **LAB work**
RESPONSIBILITY AND AUTONOMY	• Demonstrates ability to work without supervision. • Ability to learn/work independently and as a member of a team • Communicates with other members of the group, sharing information. to engage into discussions, to react and respond to an argument in a correct way; • Effectively plan the resources related to expected activities and to be responsible for the work done.	**11.1** **11.3** **11.5** **11.4** **2.2**		**x**	**x**					**x**	**PBL, PPT** **LAB work**

Week	N/N	Subjects	Topics	Lectures (h)	Sem (h)	TSE	Lab	Notes
I-II	1	**Cl. Biochemistry**	Biochemistry of bleeding and blood clotting problems. LAB: Measurement of calcium level into the blood	2	1		2	
	2	**Pathology**	General pathology of Cardiovascular system; Atherosclerosis; Hypertension; Ischemic heart disease; Endocard and pathology of Heart valve disorders;	4	2			
	3	**Immunology**	Antibacterial Immunity - innate and adaptive mechanism; The immune response and periodontal bacteria; Importance of neutrophils Innate immune sensing of periodontal bacteria;	2	1			
	4	**Cl. Microbiology**	Primary colonizers; Beneficial effects of bacterial colonizers; Ecological plaque hypothesis; Caries as an infectious disease ; Dental caries as a transmissible disease; Streptococcus mutans; Mutans group streptococci; Virulence factors of S. mutans: Initial attachment to tooth surfaces; Polysaccharide production; Acid production; Acid tolerance Biofilm adaptation; Link between S. mutans and dental caries; Types of dental caries; Important bacteria in caries; Emerging and polymicrobial pathogens; Infective endocarditis; Bacteria in IE; Mechanism of vegetation formation; Bacterial virulence factors; Antibiotics in IE	3	2			
	5	**Pharmacology**	Antihypertensive Drugs; Antianginal Drugs; Antiarrhythmic Drugs; Cardiotonic drugs: glycosides, adrenergic agents, Heart failure treatment; Drugs with important actions on smooth Muscle: Histamine, Serotonin and Ergot Alkaloids; Vasoactive Peptides; The Eicosanoids and Related Compounds; Pharmacotherapy of Asthma;	3	2			
	6	**Radiology**	Standard Imaging Methods and Image Interpretation. Basics of Radiography; CT; MRI. Contrasting methods. Examinations of vessels.	1	1			
	7	**PBL**			2			
III-IV	1	**Cl. Biochemistry**	Biochemical aspects of chronic Periodontitis; Biochemical aspects of aggressive Periodontitis.	3	2			
	2	**Pathology**	Anemias; Coagulopathy, Disseminated intravascular coagulation; Non-neoplastic disorders of white blood cells Thrombocyte disorders; Hemodynamic disorders, Thromboembolic disorders and shock; Blood cancers, methods of laboratory testing, Pathology Lab	4	2		2	
	3	**Immunology**	Immunity to caries; Anti-caries strategies; Inhibitors; Probiotics; Immunization; Vaccination;	2	1			

	4	**Cl. Microbiology**	Periodontal diseases; Classification of periodontal diseases; Role of plaque bacteria in periodontal diseases; Role of host factors in periodontal diseases; Microorganisms associated with periodontal diseases; Gingivitis; Chronic periodontitis; Localized aggressive periodontitis Generalized aggressive periodontitis; Color-coded complexes; P. gingivalis, a consensus pathogen; A. actinomycetemcomitans, a pathogen in LAP Culture independent bacterial detection; Colonization by periodontal bacteria; Adhesion; Periodontal bacterial adhesins; Intracellular invasion; Mechanisms of invasion; Host responses to intracellular bacteria; Virulence factors of periodontal bacteria; Toxins Proteolytic enzymes; Bacterial components that impact alveolar bone;	3	2			
	5	**Pharmacology**	Pharmacotherapy in peripheral arterial occlusive and venous thromboembolic disease;Drug treatment of dyslipidemias; Drug Used in Disorders of Coagulation; Agents Used in Anemias and generally in cytopenias; Hematopoietic Growth Factors;	4	2			
	6	**Cadaver Lab**				3		
	7	**Radiology**	Radiological semiology for skeletal system. Degenerative diseases , fractures, tumors. Radiology of head and neck.Head Trauma, Intracranial Hemorrhages, Hydrocephalus;	1	1			
V-VI	1	**Cl. Biochemistry**	Biochemical aspects of dental caries	2	1			
	2	**Pathology**	Pathologies of oral cavity and diseases of salivary glands; General pathology of esophagus; Pathology of stomach (gastritis, peptic ulcer, herniations); General pathology of small and large inestines.	4	2			
	3	**Immunology**	Hipersensitivity I, II, III, IV, V	2	1			
	4	**Cl. Microbiology**	Endodontic infections; Dentinal tubules; Bacterial invasion of dentin; Microbiota of endodontic infections; Symptomatic versus asymptomatic Treatment; Host factors in endodontic infections; Pulpal infections; Periapical abscesses; Resistant bacteria; Anti-microbial effects of fluoride Enhancing anti-microbial effects; Gram positive rods and filaments: actinomyces; eubacterium and related genera; lactobacillus. Gram negative cocci; Gram negarive rods: facultatively amnaerobic and capnophilic genera obligately anaerobic genera; Micoplasma.	3	2			
	5	**Pharmacology**	Pharmacotherapy of cognitive disorders; Clinical pharmacology of opioids ; Drugs of abuse; Anesthetic premedication and skeletal muscle relaxant. General anesthetics and Local anesthetics.; Pharmacotherapy of psychosis and lithium ; antidepressants; Anesthetic premedication and skeletal muscle relaxants;	4	2			
	6	**Radiology**	Cardiac Imaging and recognizing heart disease and mediastinal lesions;Thoracic Elementary Lesions: atelectasis, pleural effusion, pneumothorax, cysts, cavities, TB.	1	1			
	7	**PBL**			1			

VII-VIII	1	**Cl. Biochemistry**	Biochemical affects of fluoride and mechanisms of fluoride protection from caries	1	1			
	2	**Pathology**	General pathology of exocrine pancreas diseases; Diabetes mellitus; General pathology of thyroid and parathyroid glands. General pathology pathology of kidney: glomerular diseases (nephrotic and nephritic syndromes) and tubulointerstitial diseases;	4	2			
	3	**Immunology**	Antifungal Immunity; mechanism.	2	1			
	4	**Cl. Microbiology**	Candida albicans and fungal infections; C. albicans infections; Denture stomatitis; Angular cheilitis; Gingivitis and periodontal disease; Prosthetic implants;	1	1			
	5	**Pharmacology**	Antifungal agents; Biofilms and antifungal drugs; Antiviral agents; Antimycobacteriel Drugs; Antiprotozoal Drugs; Antihelmintic Drugs.	3	2			
	6	**Cadaver Lab**				3		
	7	**Clinical Skills**	First aid in severe bleeding			2		
	8	**Radiology**	Radiology and disorders of Digestive, Hepatobiliary, Urinary Systems. Nomalies, inflammations, stones.	1	1			
	9	**Review Hours**			2			
		BLOCK EXAM						**2**
XVII-XIX			**CONSULTATION**					**2***
			FINAL EXAM					**2**
		TOTAL HS	**117**	60	41	8	4	**4**
		Independent hs	**63**					