DEN 2001 Biological Bases of Disease I

Course title	Code	Semester	Type of course	Course structure and volume (hours)			ECTS
Biological Bases of Disease I	**DEN 2001**	**III**	**Mandatory**	**LECT**	55	180	**6**
				SEM	35		
				TCE			
				TSE	10		
				LAB	2		
				BL.EX.	2		
				FINAL EX.	2		
				INDEP. WORK	74		
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 **Nino Tebidze,DD, PhD Assistant professor** Mob.tel: 591 310 008; E-mail: nino.tebidze@bauinternational.edu.ge **Tamta Chkheidze-** Invited Lecturer Mob.tel: 599001538; e-mail:tamta. chkheidze@bauinternational.edu.ge **Akaki Ivanishvili**- Assistant Professor, Invited Teacher mob.tel 595311303 e-mail: akaki.ivanishvili@bauinternational.edu.ge **Giorgi Chilingarashvili**-Invited Lecturer, MD Mob.tel: 551459943; e-mail: giorgi.chilingarashvili@bauinternational.edu.ge **Natalia Dachanidze** – Invited Teacher, Doctor of Biology Mob.tel: 598 117 128; E-mail: natalia.dachanidze@bauinternational.edu.ge **Sopio Dzneladze -** Invited Teacher, PhD Mob.tel: 593606670; E-mail: sopho.dzneladze@bauinternational.edu.ge Personal one-to-one consultation can be arranged at an agreed upon date and time						
Duration	8 weeks						
Prerequisite	MED 1001 – MED 1008						

Aim	The aim of the module is to give a student general knowledge about pathological structural and functional changes in the cells and tissues especially of an oral cavity, in response to the damaging effects of various factors; about the role of microorganisms in health and disease with an emphasis on their role in oral diseases; The main pathological processes and immunopathogenesis that occur during acute and chronic inflammation caused by different agents and will be given information about anti-inflammatory drugs too. Students will be familiar with the main viruses related to the oral cavity and immune response against viruses. In addition, regeneration and the process of fibrosis, mechanisms of thromboembolism and the role of the immune system in it will be discussed in detail. Students will be familiarized with changes occurring during immune system disorders; the role of the immune system in anti-tumor and anti-viral defense. Students will be able to get a grasp on systemic pathology, starting with a general overview of liver and respiratory tract pathology, cancerogenesis, and osteopathology. In this block will be given general information about basics of pharmacokinetics and pharmacodynamics, drug receptors; the relation between drug dose & clinical response, agonists and antagonists, therapeutic index routes of drug administration, factors affecting the choice of route of drug administration, biotransformation of drugs, toxicity. In addition, the principles of using drugs with pregnant, pediatric, and geriatric patients will be discussed. Students will be familiar with first aid manipulation which should be done in case of wound care and fracturing.
Methods of Teaching/Learning	Lecture, Seminar, Laboratory work, teaching in simulation environment - TSE, 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 points;
- Subject B - 3 points;
- Subject C - 3 points.

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 different 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 80 questions and the value of each is 0,5 points. The highest possible score is 40. A Block exam is passed in which 40% of each subject's questions are answered.

3. Final Exam - 40 points

Final exam is conducted in a 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, students will be assessed from the following learning courses: immunology, biochemistry, pathology, topographic anatomy, medical microbiology, pharmacology.
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 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 a low level. The material is poorly presented. The student masters the main literature on an 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 40% 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 than 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 retake the exam during the additional examination period.
If the final evaluation for the Block, after taking the additional exam, (current evaluation + block exams 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. 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; Abdul 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; 9th.ed. 2018. 5. **Exploring Immunology.** MacPherson Austin; 2013 6. **Lippincott Illustrated Reviews Flash Cards:Immunology-**Deborah Lebman; Wolters Kluwer; 2016. ***Topographic Anatomy*** 7. **Clinically Oriented Anatomy**- Moore, Keith L; Wolters Kluwer; 8th.ed. 2018; ***Medical Microbiology*** 8. **Marsh and Martin's Oral Microbiology;** Philip D. Marsh; Michael A.O. Lewis; 6th edition, 2016 9. **Oral Microbiology at a glance;** Richard J. Lamont; Howard F. Jenkinson; 2010 ***Pharmacology*** 10. **Pharmacology Examination and Board Review – Bertram G.** Katzung, Anthony J. Trevor J; Mc-Graw Hill Education. 12th. ed; 2018. 11. **Pharmacology Flash Cards-**George Brenner; Elsevier; 4th ed. 2018 ***Biochemistry*** 12. **Biochemistry: Lippincott's illustrated Reviews-** Ferrier Denice R; Wolters Kluwer; 7th ed. 2017. 13. **Color Atlas of Biochemistry-**Jan Koolman; Klaus-Heinrich Röhm; Thieme; 3rd.ed. 2013; 14. **Lippincott's illustrated Reviews Flash Cards : Biochemistry-**Ferrier Denice R; Wolters Kluwer; 2015. ***Radiology*** 15. **Grainger & Allison's diagnostic radiology: A textbook of medical imaging-**AndyAdam;Churchill Livingstone; 6th ed; 2015

	16. **Introduction to Radiologic imaging sciences & patient care**-Arlene M. Adler; Richard R.Carlton; Elsevier Saunders; 6th ed; 2016;
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 **supplement 1**

QF*	COURSE LEARNING OUTCOMES	PROG. LO	LECTURE	SEMINAR	LAB	TEACHING IN SIMULATION	TEACHING IN CLINIC	BLOK/MIDTERM EX.	FINAL EXAM	ASSESSMENT METHODS
KNOWLEDGE AND AWARENESS	• Explains major mechanisms of tissue and cellular damage, immunopathogenesis, regeneration, repairmen and adaptation. • Distinguishes acute and chronic inflammation and evaluate the role of immune system in it; • Formulates apoptosis different mechanisms; • Differentiates pathological changes during acute/chronic inflammation of tissue and role of immune mechanisms in it; • Realizes role of microorganisms in health and disease with an emphasis on their role in oral diseases; • Knows main viruses related to oral cavity and diseases which they cause; • Recognizes immune defence mechanisms against viruses and cancer; • Explains role of immune system in thrombosis and role of autoimmune responses in Periodontal Disease; • Applies laboratory diagnostic techniques and interpret the results; • Describes the effects and the drug-drug, drug-food and drug-receptor interactions, pharmacokinetics and pharmacodynamics; • Define the importance of therapeutic index and routes of drug administration;	**5.1; 5.2**	**x**	**x**	**x**	**x**	**x**	**x**	**x**	**PBL LAB work**

	• Know the importance of choosing the appropriate route for drug administration • Describe the antimicrobial agents` mechanisms of action • Know the side effects of antimicrobial medications • Differentiate the action of steroidal and non-steroidal anti-inflammatory drugs action and possible side effects; • Know the drugs used for osteoporosis and Gout; • Describe the action of anticancer medications • Explains general steps of wound care; burning skin care and fracture first aid									
SKILL	Student has ability to: • Apply acquired basic knowledge in cadaver dissection; • Effectively communicate with peers and audience, use appropriate terminology during discussion; • Identify benign and malignant neoplastic changes under the microscope; • Predicts outcome of the pathological processes based on morphological, anatomical, biochemical, microbiological and immunological data; • Prepares reports of laboratory work including data graphing and its interpretation; • Uses study resources and materials effectively and efficiently; • Distinguish topography of different structures on the models and/or cadavers • Apply bandages and plastic stiches;	6.1 11.3 11.4 11.5		**x**	**x**	**x**	**x**		**x**	**PBL, PPT LAB work**
RESPO	Student demonstrates ability	**2.2 11.1**		**x**	**x**				**x**	

NSIBILITY AND AUTONOMY	• To learn/work independently and as a member of a team, to plan strategically; • Communicates with group members, to engage into discussions, to react and respond to an argument in a correct way; • Assemble work in a group and to observe, listen to, summaries, ask and answer questions and can take part into discussions; • Manage information, has the capacity for organizing and planning (including time management); • keeps deadlines • has ability to analysis and synthesis	**11.3 11.4 11.5**								**PBL, PPT**

Biological Basis of Disease I **Supplement 1**

Week	N/N	Subjects	Topics	Lectures (h)	Sem (h)	TSE	Lab	Notes
I-II	1	**Cl. Biochemistry**	Collagen formation disorders, biochemical aspects of scurvy.	1	1			
	2	**Pathology**	Cellular adaptive processes; Reversible-irreversible cell damage, Tissue regeneration and repairmen; General principles of pathology of acute and chronic inflammation.	4	2			
	3	**Immunology**	T cell maturation and selection, Apoptosis; Antiviral Immunity; mechanism; examples; Tc against virus infected cells, Apoptosis of virus infected cells; Inflammation; Types of inflammation: acute and chronic; Anti-microbial components in saliva Salivary mucins and agglutinins; Bacterial agglutination; Secretory Immunoglobulin A: Production and function of S-IgA; Inactivation of salivary defences; The window of infectivity; Selective IgA deficiency;	4	2			
	4	**Cl. Microbiology**	Microbial basis of infectious disease; Herpes viruses;	1	1			
	5	**Pharmacology**	Introduction to Pharmacology; Basics of Pharmacokinetics and Pharmacodynamics. Drug Receptors and Pharmacodynamics; Relation between drug dose & Clinical response; Agonists and antagonists; Dose in pharmacology; Therapeutic index routes of drug administration, Factors affecting the choice of drug administration rout.	2	1			
	6	**Top.Anatomy**	Mediastinum: Its divisions. Pericardium. Thoracic region:Thoracic cavity; Wall; Visceral organs.	2				
	7	**PBL**			2			
III-IV	1	**Cl. Biochemistry**	Role of antioxidants on collagen synthesis	2	1			
	2	**Pathology**	General principles of cancerogenesis, characteristics of benign and malign neoplasm; Pathology Lab	4	1		2	
	3	**Immunology**	Immunologic aspects of tumor Development; Tumor antigens as a diagnostic markers; Immunotherapy of tumors.	2	1			

	4	**Cl. Microbiology**	Papillomaviruses; Parvoviruses	2	2			
	5	**Pharmacology**	Pharmacokinetics; Absorption, Distribution, Metabolism and Elimination; Drug-drug interactions and food-drug interactions, major pharmacokinetic parameters. Basic principles of drug toxicity; Drug induced immune response, Development and regulation of drugs. Special aspects of perinatal, paediatric and geriatric pharmacology; Therapeutic and toxic potential of over the counter drugs; Concept of pharmacogenomics	3	1			
	6	**Cadaver Lab**	Thoracic cavity			3		
	7	**Top.Anatomy**	Abdominal Cavity: Walls; Peritoneum, its formations (Bursas ; mesenteries). Visceral organs ,blood supply.	2	1			
V-VI	1	**Cl. Biochemistry**	Biochemistry of zinkins, matrylisins and role of matrix metalloproteinases in pulpal inflammation	2	2			
	2	**Pathology**	General principles of fractures and dislocations; Osteomyelitis, septic arthritis and specific infections of the bone and the joints; Osteomalacia, Rickets, Osteoporosis; General principles of Autoimmune diseases.	4	2			
	3	**Immunology**	Autoimmunity; mechanism of autoimmune disorders (review of autoimmune disorders that damage oral cavity). Role of Autoimmune Responses in Periodontal Disease.	2	1			
	4	**Cl. Microbiology**	Hepatitis B virus (HBV); Hepatitis D virus (HDV, delta agent); Other hepatitis viruses;	1	1			
	5	**Pharmacology**	Introduction to antimicrobial medications; Pharmacotherapy in bacterial infections: Beta-lactam antibiotics; Cell wall and membrane-active antibiotics; Protein synthesis inhibitors; Quinolones; Sulfonamides;	4	2			
	6	**Top.Anatomy**	Inguinal region. Hip joint; Femoral triangle, its clinical significance; Knee region, popliteal fossa. Upper limb region: Axillary region; cubital fossa.	2	1			
	7	**Clinical Skills**	Wound care, burning skin care, fracture first aid			4		
	8	**PBL**			1			
VII-VIII	1	**Cl. Biochemistry**	Effects of the rikets, osteomalacia and osteoporosis on teeth	2	2			
	2	**Pathology**	General pathology of the liver (hepatitis, cirrhosis), Jaundice; General pathology of respiratory system - Pneumonias, COPD	3	2			
	3	**Immunology**	Immunological aspects of thrombosis;	1	1			
	4	**Cl. Microbiology**	HIV; AIDS	1	1			

	5	**Pharmacology**	Non-steroid and steroid Anti-inflammatory drugs. Prophylaxis and pharmacotherapy of osteoporosis; Drug used in Gout. Cancer Chemotherapy: Alkylating Agents; Antimetabolites; Antitumor Antibiotics, Natural Product; Growth Factor Receptor Inhibitors, Tyrosine kinase inhibitors;	2	1			
	6	**Cadaver LAb**	Abdominal Cavity			3		
	7	**Top.Anatomy**	Back region: Posterior cervical region; Vertebral column; Spinal Cord.	2	1			
	8	**Review Hours**			1			
		BLOCK EXAM						**2**
XVI-XIX			**CONSULTATION**					**2***
			FINAL EXAM					**2**
		TOTAL HS	**106**	55	35	10	2	**4**
		Independent hs	**74**					