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### თბილისის ჰუმანიტარული სასწავლო უნივერსიტეტი

**TBILISI HUMANITARIAN TEACHING UNIVERSITY**

**Syllabus**

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| **Name of the course /module** | **Microbiology and Parasitology** |
| **Code of the course** | **PhM0416DM** |
| **Status of the course**  **(elective/compulsory)** | **C**ompulsory course  for the one-cycle higher educational Programme-Dentistry |
| **ECTS** | **4 credits.Total:100 hours**  Contact Hours–49hours (Class Meeting Time Period:15L/30Pr.) + 4 hours (Midterm:2h and Final Examinations 2h):  Individual Work-51 hours |
| **Authors (lecturer)** | Mzia Tsiklauri- Ph.D. (Biology), THTU invited lecturer  Tel.577413050  Consultation days: according to consultation schedule Wednesday, 13.00-15.00. |
| **Aim of the course** | Medical Microbiology for medical students is a one-semester course that emphasizes the interaction of microorganisms with humans and the diseases they cause. This will enable students to understand disease-causing representatives of different groups of microorganisms and how these are transmitted and controlled. They also learn how to avoid the spread of infectious microorganisms in the hospital environment. Topics include microscopy, survey of various microbes, the immune system, food microbiology, microbial pathogens and mechanisms of disease transmission. The course is complimented by laboratory exercises in which students acquire hands-on experience in studying various aspects of microbiological applications. |
| **Program prerequisits** | Medical Biology |
| **Assessment system and criteria** | **Assessment system of the Tbilisi Humanitarian Teaching University's**is divided into the following components:  The total marks of the mid term Out of the overall assessment (100 points ) is 60 points, which includes three kinds of grades:  **Student’s activity during a semester -30points;;**  **One-midterm exam – 30points;**  **final exam**-**40 points.**  Theminimum competence requirement for mid termevaluation components is at least 18 points in total.  **The minimum competence requirement of the final evaluation is 50% of the total mark from final evaluation that means 20 points out of 40.**  Evaluation System includes:  I. Five Forms of Positive Assessment:  (A) Excellent – 91% and more from maximum evaluation  (B) Very good – 81-90% from maximum evaluation  (C) Good – 71-80% from maximum evaluation  (D) Satisfactory – 61-70% from maximum evaluation  (E) Sufficient – 51-60% from maximum evaluation  II. Two Forms of Negative Assessment:  (A)(FX) Fail (Not passed ) - 41-50 from maximum evaluation score, which means that the student will need to work more and to retake the test after additional independent work;  (B) (F) Fail – A student gets 40 points, or less from maximum evaluation, which means that the work done by him/her is not sufficient and s/he has to retake the course from the beginning.  1. One of the negative assessment: In case of not passing, the University fixes additional exam at least in 5 days, after the announcement of final examination results, which must be published in the examination table.  2. The grades, which student gets after additional test is a student's final grades, in which is not considered the negative points of the major examination.  If a student receives from 0 to 50 points after additional test, in the final exam sheet is formed (F) -0 for the student. |
| **Course description** | appendix 1 |
| **Assessment system/activities, methods**  **and criteria** | A student’s final grade is obtained as a result of summing the midterm evaluation earned per semester and final exam evaluation results.  The sum of the course assessment (100 points) breaks down as follows:   * **Activities – 30 points** *(participation, presentation, quiz)* * **Midterm exam - 30 points** * **Final Exam - 40 points** * ***Activities/Participation*** *–* **15 points,** is calculated in accordance with the level of being active during each practices(once a week, total number 15) type of activities can be answering questions, participation in discussion, participation in everyday testes - is equal **1 points**.   1 points - s/she is active during classes, obtains perfect knowledge of the ongoing topic, answers all questions completely.  0,5 points - s/he is less active during classes, does not present perfect knowledge of the ongoing topic, answers questions partly.   1. - s/he is less active during classes/group works, does not present perfect knowledge of the ongoing topic, does not answer any questions.   *Activities/****Presentation* -5 points,**  The presentation is assessed using next criteria:   * **the content of the presentation, the use of modern scientific literature-2 points**   2 points - the presentation has complete data, marked by different sources of use, subject fully covered.  1 point - the data is limited, findings are not currently, less than source used;  0 points - generally there is a single source used, the content is not properly conveyed   * **design of the presentation -1 points**   1 point - External Wallpaper well-perceived, the slides are relevant to the topic, the slides used in the various types of credit facilities: animations, images and so forth.  0 point - the title is not signed, slides and other facilities are not used.   * **presentation skills - 2 points**   2,0points - freely attracts attention of the audience, answers all questions well. Contact with the audience is based on effective, correct speech, good and interesting,the audience reaction is adequate.  1,0point - has difficulties in communication with the audience, contact with the audience is weak, sometimes boring, the problems are not being raised, the audience is experiencing difficulty.  0 points – s/he is not ready to communicate with the audience, the audience did not heed the presentation.  ***Quiz* – 10 points,** are carried out **twice during semester**, student can get for one quiz maximal 5points (5X2=10). Evaluation is performed by using questionnaires in written form, in each questionnaire there are 10 questions, each is appraised by 0,5 points.   * **Midterm exam - 30 points** administered in writtenform. The questions from covered material and each correct answer are evaluated with 1 point, wrong answer -0 points. * **Final Exam -40 points**   The examination is conducted by a combination of written(computer test) and verbal exam and includes:   * The written test -20points * Verbal task -20 points / 4brief topics, each is equal 5points   Criteria of assessment of verbal topics are :  **5 points –**The answer is complete; Terminology is configured; student obtains perfect knowledge of the topic, s/he coveres of the material fluently, summarises core and additional literature, reveales critical thinking and logical analysis.  **4 points** -The answer is not absolutely complete; student obtains knowledge of the topic, without important mistakes, s/he coveres of the material fluently, summarises core literature, reveales critical thinking and logical analysis.  **3 points -** The answer is not complete; student obtains satisfactory knowledge of the topic, s/he coveres of the material by mistakes, summarises core literature, reveales less of critical thinking and logical analysis.  **2 points** - The answer is weak; student obtains satisfactory knowledge of the topic, makes mistakes, does not summarises core literature, cant make critical thinking and logical analysis.  **1 points -** The answer is substantially incorrect. Set out in the relevant material of the individual fragments. The student is not able to analyze the material. |
| **Core literature:** | 1. Murrey, Pfaller, Rosenthal. Medical Microbiology, 2005 |
| **Additional literature** | 1. Jawetz, Melnick, Adelberg. Medical Microbiology (25th Edition), 2010   Diagnostic Microbiology-C.R.Mahon, G.Manuselis Text book 1995 |
| **Learning outcomes, competences**  **(general and field specific)** | **Knowledge**   1. Student describes morphology and physiology of microorganisms, their dissemination in the environment and their role in the processes developing in nature 2. Student categorizethes pathogenic microorganisms causing diseases in humans, animals and insects. 3. Student describes basic characteristics of the structure, metabolism, genetics and classification of bacterial infections.   **Skills**   1. Student conducts basic microbiology investigations using conventional and modern methods in bacteriology, virology, mycology and parasitology research and diagnostics 2. Student determines process of collection of diagnostic material for microbiology investigations. |
| **Learning/Teaching methods** | Lecture/ practical  Individual/Group work  Verbal teaching method  Demonstration of study materials  Presentation  Explanation methods  Discussion/debate |

**Appendix1**

**Course description:**

**Topics of the lecture, practical classes/laboratory work/working group, literature**

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| **Week №** | **Type of**  **the class** | **Topics** | **Contact hours** | **literature** |
| **I** | Lect. | The introductory lecture. Medical microbiology; the subject of virology, its objectives, branches, methods of research; the importance of medical biology in the practical activity of a pharmacist; the role of microorganisms in nature, public economy and medicine.The periods of the development of microbiology. | **1** | **1** |
| Pract. | The organization and equipment of the microbiological laboratory; working regulations in the laboratory; microscopic study of microorganisms; the rule of working with the immersive system of the light microscope. Preparing microorganism preparations:drop preparations, fixed preparation, preparation print. | **2** | **1** |
| **II** | Lect. | The place of microorganisms in the system of living creatures; the four kingdoms of life; the systematization of bacteria, nomenclature, identification; the taxonomic systems. A”Bacterial identification”of the American bacteriologist Bergey. | **1** | **1** |
| Pract. | Sterilization; the methods of assessing the effects of antiseptics and disinfectants; the types of sterilization and equipment. Major nutrient agars; the classification of nutrient agars according to their composition, function and consistency; the peculiarities of their preparation. | **2** | **1** |
| **III** | Lect. | The morphology of bacteria (Actinomycetes, Rickettsia, Chlamydia, Mycoplasma);the morphology of fungi and saccharomycetales; the morphology of protists;the morphology of viruses. The ultrastructure of a bacterial cell. | **1** | **1** |
| Pract. | Microbial cultivation; culture characteristics; inoculation; highlighting a pure microbial culture and determining the purity of a culture. The morphology of bacteria; making preparations. | **2** | **1** |
| **IV** | Lect. | The physiology of bacteria, the types of nutrition; transportation of nutrients in a bacterial cell; the secretion of the products of the activity of a bacterial cell; nutrient agars; bacterial growth and replication; the phases of development; the growth curve; the dormant forms of bacteria – endospores. The biochemistry of bacteria; metabolism (catabolism, anabolism); bacterial ferments; the peculiarities of energy exchange; plastic metabolism; respiration; boiling. | **1** | **1** |
| Pract. | The morphology of fungi and saccharomycetales; the morphology of actinomycetales; making preparations.Cellular structure; staining bacteria according to the Gram rule; staining the capsule; stainingacid-resistant bacteria using the method of Tsil-Nilsen; discovering bacterial cellular organelles through microchemical reactions. | **2** | **1** |
| **V** | Lect. | General virology; the correlation between a virus and a cell; bacteriophages or phages; virus cultivation; identification. The genetics of bacteria; the peculiarities of the genetics of bacteria; hereditary factors; the molecular mechanisms of bacterial changes; bacterial recombination; the genetic peculiarities of viruses; genetic engineering and the prospects of genetic therapy. | **1** | **1** |
| Pract. | The study of microbic movement; making a hanging drop preparation; the types of the arrangement of flagella in bacterial cells. Bacterial endospores, staining them according to the Peshkov method; the position of spores in a bacterial cell.  **1st quiz** | **2** | **1** |
| **VI** | Lect. | The ecology of microorganisms; the microflora of air, water and soil; the characterization of the major biocenoses of the human organism. Environmental effects on microorganisms; the effets of physical and chemical factors; antimicrobial activities; certain chemical substances used for antimicrobial activities. | **1** | **1** |
| Pract. | Cellular structure; staining bacteria according to the Gram rule; staining the capsule; stainingacid-resistant bacteria using the method of Tsil-Nilsen; discovering bacterial cellular organelles through microchemical reactions. | **2** | **1** |
| **VII** | Lect. | Infectology; infection forms; the dynamics of the development of infectious diseases; infectious agents and their characteristics; bacterial toxins; the peculiarities of viral infections; conventional infections. The basics of the chemotherapy of infectious diseases; | **1** | **1** |
| Pract. | The microflora of water; coli-titer, coli-index; the normal microflora of a healthy human body. the main group of chemical preparations and mechanisms of their antimicrobial activity; The methods of determining the antimicrobial activity of chemotherapic preparations and the microbial sensitivity to them. | **2** | **1** |
| **VIII** | **Midterm** | | 2 |  |
| **IX** | Lect. | Immunobiological preparations; vaccines, probiotics, immune sera, immunoglobulins, immunotoxins, abzymes, immunomodulators; adaptogens. | **1** | **1** |
| Pract. | The microflora of soil and air; the sanitarian-bacterioligical methods of evaluating microbial pollution. | **2** | **1** |
| **X** | Lect. | The ways of catching infectious diseases; the source of spreading; infection forms; the methods of microbiological diagnostics; serological reactions.Causative agents of wounds and pus infections; the microbiology of pathogenous cocci, staphylococci and streptococci;enterococci. | **1** | **1** |
| Pract. | Selecting material for microbiological, virological and serological analysis; the methods of microbiological diagnostics; serological reactions. Microbiological diagnostics of the infections caused by staphylococcus and streptococcus  **/ presentation** | **2** | **1** |
| **XI** | Lect. | Gram negative cocci: the microbiology of meningococci and gonococci.  The family ofEnterobacteriaceae; causative agents of Escherichiosis; yersinia: causative agents of plague, pseudotuberculosis and intestinal yersiniosis. | **1** | **1** |
| Pract. | Microbiological diagnostics of the infections caused by meningococci and gonococci. Microbiological diagnostics of Escherichiosis and plague. | **2** | **1** |
| **XII** | Lect. | Salmonella causing typhus and paraphyte A and B; Shigella causing bacterial dysentery; the microbiology of Klebsiella, Proteus and bacteroides. Causative agents of particularly dangerous infections; the microbiology of brucellosis, tularemia, malleus and Siberian ulcer; the coli of blue-green pus; hemophilic bacteria; legionella, lactobacteria. | **1** | **1** |
| Pract. | Microbiological diagnostics of typhus and paraphyte A and B.  Microbiological diagnostics of tularemia. Microbiological diagnostics of brucellosis. Microbiological diagnostics of Siberian ulcer. | **2** | **1** |
| **XIII** | Lect. | Causative agents of anaerobic infections: the microbiology of tetanus, gas gangrene and botulism; causative agents of food toxic infections. Vibriones; the microbiology of cholera; campylobacteria; Helicobacter pylori; spirochetes, the microbiology of syphilis; causative agents ofsoft chancre. | **1** | **1** |
| Pract. | Causative agents of air-borne infections; the microbiology of pertussis, diphtheria, tuberculosis and leprosy. Microbiological diagnostics of botulism; microbiological diagnostics of food toxic infections. | **2** | **1** |
| **XIV** | Lect. | Causative agents of transmissible infections; Borrelia of epidemic and endemic typhinia; leptospira; rickettsia; the rickettsia of epidemic and endemic Typhus Exanthematicus; chlamydia (causative agents of ornithosis and trachoma); mycoplasma (causative agents of pneumonia and urogenital infections); the microbiology of actinomycosis and nocardiosis. | **1** | **1** |
| Pract. | Microbiological diagnostics of anaerobic infections (gas gangrene, tetanus).  **2nd Quiz** | **2** | **1** |
| **XV** | Lect. | The families of RNA-containing viral infections:picornaviruses, caliciviruses, reoviruses, retroviruses,togaviruses, flaviviruses, bunyaviruses, arenaviruses, filoviruses, rhabdoviruses, coronaviruses, paramyxoviruses, orthomyxoviruses. | **1** | **1** |
| Pract. | The families of DNA-containing viral infections: adenoviruses, parvoviruses, herpesviruses, poxviruses, oncogenic viruses. | **2** | **1** |
| **XVI** | Lect. | Medical protozoology; medical mycology; causative agents of mycological and protozoal infections. | **1** | **1** |
| Pract. | Microbiological diagnostics of syphilis;microbiological diagnostics of transmissible infections. | **2** | **1** |
| **XVII-XVIII** | **Final exam** | | **2** |  |
| **XIX-XX** | **Additional exam** | |  |  |