COURSE DESCRIPTION CHART

Faculty of Medicine and Health Sciences
Field of study: Medicine
Mode of study: Full-time
Level of study: Uniform master`s study
Profile of study: General Academic
Academic Year: 2023/2024

Basics of Laboratory Diagnostics	
NAME OF THE COURSE	**Basics of Laboratory Diagnostics**
ECTS Credits for the course of study	3
LANGUAGE OF THE COURSE	English
PERSON CONDUCTING THE COURSE	Professor Jakub Swadźba MD, PhD Tomasz Anyszek MD, PhD Agnieszka Piechowska, PhD Danuta Kozłowska, MSc
PERSON RESPONSIBLE FOR CONDUCTING THE DISCIPLINE	Professor Jakub Swadźba MD, PhD
NUMBER OF HOURS	
LECTURES	30
CLASSES	15
COURSE OBJECTIVES	
C1	To familiarize students with the basics of laboratory diagnostics, which is an important factor in forming the final diagnosis of a patient's disease. Preparing students for differential diagnosis of laboratory tests through the ability to compare the obtained results.
C2	Understanding of basic laboratory techniques and methods. Student`s understanding of the quality and reliability of laboratory test result.
INTENDED LEARNING OUTCOMES	
MW1	Presentation of the basics of laboratory diagnostics, including the principles of patient preparation for testing, methodology of collecting material for testing, transport and storage of material before the test.

Basics of Laboratory Diagnostics	
MW2	Analysing and interpreting laboratory tests results obtained in various diseases. Indication of algorithms for diagnostic procedures in metabolic, infectious and hereditary diseases and organ damage.
MW3	Principles of organizing the work in medical laboratories. Proper cooperation beetwen the therapeutic team and laboratory staff.
MW4	Interpretation of laboratory test results to differentiate physiological and pathological conditions in different age groups. Explaining the basics of molecular laboratory diagnostics.
MU1	Using laboratory test results to make the correct diagnosis and changes monitoring during the course of the disease, including treatment results
MU2	Interpretation of the influence of drugs and diet on the results of specific diagnostic parameters. Correct selection of diagnostic algorithms in diseases affecting specific tissues and organs.
MK1	Social competences. The student accepts the need to evaluate both analytical information and information systems, using digitalization for purposes of clear presentation of the test results for the patient and the HIS/LIS system.
PRELIMINARY REQUIREMENTS	
Student has knowledge of biochemistry, immunology, microbiology, genetics and physiology	
PROGRAM CONTENT	**DETAILED SYLLABUS**
LECTURE 1	Laboratory research as a tool in the diagnosis of diseases. The rules of functioning of diagnostic laboratory. Factors affecting laboratory tests results.
LECTURE 2	Laboratory diagnostics of disorders of white and red blood cell system. Basic laboratory tests and the methods used in general haematology.
LECTURE 3	Laboratory diagnostics of hemostasis disorders.
LECTURE 4	Research in the scope of medical analytics. General urine examination.
LECTURE 5	Disorders of exo and endocrine functions of the pancreas. Diabetes.
LECTURE 6	Laboratory diagnostics of liver disorders.
LECTURE 7	Laboratory research in a diagnostics of kidney diseases. Acid-base balance disorders.

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LECTURE 8	Laboratory diagnostics of endocrine disorders (the hypothalamus and the pituitary gland, the adrenal gland, the thyroid gland and the gonads)
LECTURE 9	Tumor markers and their diagnostic usefulness.
LECTURE 10	Laboratory diagnostics in autoimmune diseases
CLASS 1	Introduction to practical classes, providing the regulations of the laboratory. Presentation of health and safety rules. Pre-laboratory error. Preparing the patient to collect biological material for laboratory tests. Blood collection for testing. Blood collection into test tubes in various closed systems. Transport of biological material. Collection of microbiological material. Collecting material for the serology laboratory. Collecting material for genetic testing. Fasting and daily profile blood samples. Serum and blood plasma. Storing blood samples before testing. Post-lab error.
CLASS 2	Complete blood count test. Parameters obtained in automatic testing on a hematology analyzer. Performing an OB test. Manual venous blood smear and automatic smear. Bone marrow examination, discussion based on microscopic preparations.
CLASS 3	Performing a general urine examination. Physicochemical examination of urine. Urine sediment examination: manual and automatic. Microscopic evaluation pf urine sediment.
CLASS 4	Performing biochemical tests in the laboratory in the past and nowadays. Interpretation of biochemical test results. Performing immunochemical tests in the laboratory. Methods and analyzers in large laboratories with a wide spectrum of research. HPLC method and other specialized techniques for determining substances in laboratories (immunofluorescence, blotting).
CLASS 5	Performing research using molecular biology methods. Tested using sequencers, including new generation (NGS). Research using microarrays.
DIDACTIC METHODS (list)	
	Informative lecture, Seminar, Discussion, Laboratory classes, e-learning methods
STUDENT`S WORKLOAD	
CONTACT HOURS	According to the course/studies plan: Participation in lectures: 30 Participation in classes 15
NON-CONTACTHOURS	Independent student`s work: Preparing for classes: 10 Preparing for the exam: 20

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TOTAL NUMBER OF HOURS	75
CLASS REGULATIONS AND ASSESSMENT CONDITIONS	
CRITERIA OF ASSESEMENT OF THE INTENDED LEARNING OUTCOMES	
IN TERMS OF KNOWLEDGE	Multiple choice test and open questions, survey
IN TERMS OF SKILLS	Partial tests during classes, completion of a practical task
IN TERMS OF SOCIAL COMPETENCES	Activity in classes
PARTIAL CREDIT TESTS	Passing partial credit tests is the basis for admission to the exam
FINAL EXAM (I i II term)	**Term I:** multiple choice test 100 questions **Term II:** multiple choice test 60 questions
CRITERIA OF EXAM / CREDIT WITH GRADE ASSESENMENT	
GRADE 3,0	60-70% positive responses on a multiple-choice, single-answer test
GRADE 3,5	71-75% positive responses on multiple choice, single answer test
GRADE 4,0	76-85% positive responses on a multiple-choice, single-answer test
GRADE 4,5	86-90% positive responses on a multiple-choice, single-answer test
NA OCENĘ 5,0	91-100% positive responses on a multiple-choice, single-answer test
BIBLIOGRAPHY	
BASIC	

1. Gaw A., Murphy M & 3 more – Clinical Biochemistry (2014, 2018)
2. Dembińska –Kieć A., Naskalski J., Solnica B. – Diagnostyka laboratoryjna z elementami biochemii klinicznej (2017)
3. Solnica B. – Diagnostyka Laboratoryjna (2019)

SUPLEMENTARY

1. Marshall W., Lapsley M & 3 more – Clinical Biochemistry (2016,2020)
2. Howard M., Hamilton P. – Haematology (2013)
3. Brunzel N. A.- Fundamentals of Urine & Body Fluid Analysis (2016, 2021)