

Educational objectives (max. 6 items)

C1. Acquisition of the knowledge on the principles of laboratory diagnostics.

C2. Understanding the basic rules underlying the design of differential diagnosis with respect to chosen common diseases.

C3. Acquaintance with the basic laboratory tests applied in diagnosis.

C4. Familiarity with the analysis and interpretation of the results of diagnostic tests.

Education result matrix for module/course in relation to verification methods of the intended education result and the type of class

Number of course education result	Number of major education result	Student who completes the module/course knows/is able to	Methods of verification of intended education results (forming and summarising)	Form of didactic class <i>**enter the abbreviation</i>
K01	E. W3	<p>Knows the principles of diagnosis of the most common internal diseases in children (with the application of appropriate laboratory tests):</p> <p>4) childhood anaemias, haemorrhagic diatheses, cancer diseases</p> <p>5) vomiting, diarrhoea, gastrointestinal bleeding, ulcers, hepatobiliary tract diseases, pancreatic diseases</p> <p>6) urinary tract infections, nephrolithiasis, acute and chronic renal failure, acute and chronic nephritis.</p> <p>7) growth disturbances, thyroid and parathyroid glands diseases, adrenal gland diseases, diabetes, obesity</p>	<p>Written exams with a defined time regime, in a form of multiple choice tests, choice of yes/no answers, matching answers</p> <p>Standardized oral exams focused on the evaluation of knowledge on the level of understanding, analysis, synthesis, problem solving.</p>	L, LC
K02	E. W7	<p>Knows the principles of diagnosis of the most common internal diseases in adults (with the application of appropriate laboratory tests), including:</p> <p>1) cardiovascular diseases: including myocardial ischemia, acute and chronic cardiac insufficiency</p> <p>2) respiratory tract diseases, including respiratory failure</p> <p>3) gastrointestinal diseases, including oral cavity, oesophagus, stomach, duodenum, intestine, and hepatobiliary system dysfunction</p> <p>4) endocrine diseases including thyroid and parathyroid gland pathologies, various types of diabetes, metabolic syndrome – hypoglycaemia, obesity and dyslipidaemia</p> <p>5) kidney and urinary tract diseases, including acute and chronic renal insufficiency, kidney glomerulonephritis, renal medullary diseases, kidney stones, urinary tract infections.</p>	<p>Written tests in a form of short essays, reports, short structured question</p> <p>Oral exams with and without the access to textbooks.</p> <p>Direct observation and evaluation of the student's manual</p>	

K03	6)	haematopoietic system diseases, including haemorrhagic diathesis	performance, his abilities to solve problems, and abilities to prepare and present scientific issues	
K04	7)	disturbances in acid-base balance and water-electrolyte balance, dehydration, hyperhydration states, acidosis, alkalosis		
K05	E.W24	Knows the principles of the early diagnosis and screening tests in cancer diseases		
K06	E.W39	Knows types of biological material applied in laboratory diagnostics, and the principles of its uptake for tests procedures.		
K07	E.W40	Knows theoretical and practical basis of laboratory diagnostics.		
	E.W41	Knows and understands the options and constraints of laboratory tests in emergency.		
	E.W42	Knows indications for the administration of monitoring therapy.		
S 01	E.U12	Performs differential diagnosis of the most common diseases in adults and children.	Observation of the students performance during laboratory classes, and their abilities of social communications also in multicultural groups	LC
S 02	E.U14	Recognizes life-threatening states (on the basis of laboratory tests)		
S 03	E.U15	Recognizes the state characteristic for alcohol and drugs of abuse intake (on the basis of laboratory tests results)		
S 04	E.U24	Interprets the results of laboratory tests and identifies the reasons of deviations.		
S 05	E.U29	Is able to conduct simple procedures, including:		
	9)	strip tests and the measurement of glucose concentration in blood		
<p>** L - lecture; SE - seminar; AC – auditorium classes; MC – major classes (non-clinical); CC – clinical classes; LC – laboratory classes; SCM – specialist classes (magister studies); CSC – classes in simulated conditions; FLC – foreign language course; PCP practical classes with patient; PE – physical education (obligatory); VP – vocational practice; SS – self-study, EL – E-learning .</p>				
<p>Please mark on scale 1-5 how the above effects place your classes in the following categories: communication of knowledge, skills or forming attitudes: Knowledge: 5 Skills: 5</p>				
Student's amount of work (balance of ECTS points)				
Student's workload (class participation, activity, preparation, etc.)			Student Workload (h)	
1. Contact hours:			40	
2. Student's own work (self-study):			15	
Total student's workload			55	
ECTS points for module/course			1,5	
Comments				

Content of classes (please enter topic words of specific classes divided into their didactic form and remember how it is translated to intended educational effects)

Lectures

1. (1h) The proper choice of laboratory investigations in disease. Limitation and interpretation of results.
2. (1h) Laboratory diagnostics of urinary tract diseases, and overall urine analysis.
3. (1h) Diagnostic problems associated with serology and transplantology.
4. (1h) Laboratory diagnostics of electrolyte and acid-base imbalance.
5. (1h) Diagnostic tests applied in cancer diseases.
6. (1h) Laboratory investigation of thyroid disorders.
7. (1h) Laboratory tests for acute myocardial infarction.
8. (1h) Clinical enzymology.
9. (1h) Toxicological diagnostics.
10. (1h) Final test in laboratory diagnostics.

Practical classes

1. (3h) Sources of error in laboratory practice.
2. (1h) Application of alkaline phosphatase determination in serum in diagnosis of hepatobiliary diseases and bone diseases.
3. (1h) Diagnostic significance of gamma-glutamyltransferase measurement in serum in hepatobiliary diseases.
4. (2h) Application of aminotransferases determination in diagnosis of liver diseases and myocardial infarction.
5. (1h) C-reactive protein as the marker of inflammation associated with various disorders.
6. (1h) Diagnostic tests indicative of iron deficiency and iron overload (quantitative determination of free and bound iron in blood serum).
7. (5h) Basic diagnostic tests applied for the evaluation of lipid metabolism disturbances (including determination of lipids profile and lipid peroxidation level in serum).
8. (5h) Diet in prophylaxis of obesity, metabolic syndrome and diabetes (examination of blood glucose level after administration of foods with different glycemic indices).
9. (2h) Diagnostic analysis of physiological fluids (including urine and cerebrospinal fluids).
10. (3h) Laboratory tests applied for the estimation of kidney function (urea, uric acid, creatinine determination).
11. (3h) Diagnostic tests applied for the assessment of blood coagulation cascade disturbances (determination of thrombin, prothrombin time, fibrinogen concentration).
12. (3h) Assessment of erythrocytes resistance to hemolysis with reference to diagnosis of hereditary spherocytosis and thalassemia..

Basic literature (list according to importance, no more than 3 items)

1. Geoffrey Beckett, Simon Walker, Peter Rae, Peter Ashby "Lecture Notes: Clinical Biochemistry" 9th edition, Wiley-Blackwell, 2013, ISBN 978-1-118-71510-9
2. Mary A. Williamson, L. Michael Snyder "Wallach's Interpretation of Diagnostic Tests" 11th Edition, 2020
3. Nancy A. Brunzel "Fundamentals of Urine and Body Fluid Analysis", Third Edition, ISBN 978-1-4377-0989-6, Elsevier

Additional literature and other materials (no more than 3 items)

1. Carl A. Burtis, Edward A. Ashwood "Tietz Fundamentals of Clinical Chemistry"
2. William Marshall, Stephen Bangert „Clinical Chemistry" ISBN 0 7234 3328 3 Elsevier Books
3. Thomas M. Devlin "Textbook of Biochemistry with clinical correlation".

Didactic resources requirements (e.g. laboratory, multimedia projector, other...)

1. Laboratories, lecture halls.
2. Laboratory utilities; water baths, centrifuges, incubators, spectrophotometers, glassware, pipettes, microscopes.
3. Multimedia projectors, whiteboards.
4. Reagents for the determination of diagnostic parameters, biological material, distilled water.

Preliminary conditions (minimum requirements to be met by the student before starting the module/course)
 Students should have the knowledge covering the material in physiology and biochemistry at the level required for the students of Medical Faculty.

Conditions to receive credit for the course (specify the form, criteria and conditions of receiving credit for classes included in the module/course, admission terms to final theoretical or practical examination, its form and requirements to be met by the student to pass it and criteria for specific grades).

In order to receive credit for laboratory diagnostics it is compulsory to actively participate in practical classes, properly conduct experiments designed in the course plan, obtain credit for laboratory reports prepared on the basis of experimental results, participate in lectures, and take the final test.

Students' attendance at the classes is compulsory. All of the absences must be made up for in the form of an additional assignment delivered by the teacher. Absences include classes on which the student was absent because of justified reasons as well as rector's days and dean's hours.

A credit for all the laboratory classes is prerequisite for participation in the final test in diagnostics (composed of single-choice questions). The final test comprises theoretical material from lectures and practical classes.

Students' achievements during the course are evaluated in accordance with the scale given below:

Grade:	Criteria for course
Very Good (5.0)	92 – 100%
Good Plus (4.5)	83 – 91%
Good (4.0)	74 – 82%
Satisfactory Plus (3.5)	65 – 73%
Satisfactory (3.0)	56 – 64%

Grade:	Criteria for exam (if applicable)
Very Good (5.0)	
Good Plus (4.5)	
Good (4.0)	
Satisfactory Plus (3.5)	
Satisfactory (3.0)	

Name of unit teaching course:	Department of Medical Biochemistry
Address	Chafubińskiego 10, 50-368 Wrocław
Phone	784-13-70
E-mail	e-mail: wl-4@umed.wroc.pl
Person responsible for course:	Dr Izabela Berdowska
Phone	784 13 92
E-mail	izabela.berdowska@umed.wroc.pl

<i>List of persons conducting specific classes:</i>	<i>degree/scientific or professional title</i>	<i>Discipline</i>	<i>Performed profession</i>	<i>Form of classes</i>
Iwona Bednarz-Misa	Doctor of Medical Sciences, specialist in medical laboratory diagnostics	Medical sciences and health sciences	Academic teacher (adjunct), laboratory diagnostician, biochemist	Laboratories, lectures

Ireneusz Ceremuga	Doctor of Medical Sciences	Medical sciences and health sciences	Academic teacher (senior lecturer) laboratory diagnostician, biochemist	Laboratories, lectures
Paweł Serek	Doctor of Medical Sciences	Medical sciences and health sciences	Academic teacher (assistant) laboratory diagnostician,	Laboratories, lectures
Agnieszka Bronowicka-Szydełko	Doctor of Medical Sciences	Medical sciences and health sciences	Academic teacher (adjunct), laboratory diagnostician, biochemist	Laboratories
Małgorzata Krzystek-Korpaczka	Doctor hab. of Medical Sciences	Medical sciences and health sciences	Academic teacher (professor), biochemist	Laboratories
Małgorzata Matusiewicz	Doctor hab. of Medical Sciences	Medical sciences and health sciences	Academic teacher (senior lecturer) biochemist	Laboratories, lectures
Izabela Berdowska	Doctor of Medical Sciences	Medical sciences and health sciences	Academic teacher (adjunct), biochemist	Laboratories, lectures
Magdalena Mierzchała-Pasierb	Doctor of Medical Sciences	Medical sciences and health sciences	Academic teacher (adjunct), biochemist	Laboratories
Bogdan Zieliński	Doctor of Medical Sciences	Medical sciences and health sciences	Academic teacher (adjunct), biochemist	Laboratories
Łukasz Lewandowski	Master of Sciences	Medical sciences and pharmaceutical sciences	Academic teacher (research and teaching worker), biochemist	Laboratories

Date of Syllabus development

21.07.2020

Syllabus developed by

Izabela Berdowska

Signature of Head of teaching unit

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