Załącznik nr 5 do zarządzenia nr 189/2025

COURSE SPECIFICATION

Course code: 0912.4.LEK.C.LD

Course title in Polish: Diagnostyka laboratoryjna
Course title in English: Laboratory Diagnostics

1. Placement of the course within the study programme

1.1. Field of study	Medicine
1.2. Mode of study	Full-time
1.3. Level of study	Uniform Master's study
1.4. Profile of study	General academic
1.5. Course specification author	Agnieszka Piechowska, PhD
1.6. Contact	agnieszka.piechowska@ujk.edu.pl

2. Generał characteristics of the course

2.1. Language of instruction	English
2.2. Entry requirements	Biology, biochemistry, physiology

3. Detailed characteristics of the course

3.1. Type of classes	Lecture - 15 h, Classes 40 h
3.2. Place of course delivery	Lectures and classes in the teaching rooms of CM UJK
3.3. Form of assessment	Lecture – E, Classes – Zo (credit with grade)
3.4. Teaching methods	Informative lecture with the usage of multimedia techniques. Classes using activation techniques.
3.5.a. Basic reading list	1. Murphy M., Srivastava R., Deans K. Clinical Biochemistry. Elsevier 2023. 2. Marshall W., Lapsley M., Day A., Shipman K. Clinical Chemistry. Elsevier Health Sciences 2025. 3. Howard M.R. & Owen M. Haematology. Elsevier 2026.
3.5.b. Supplementary reading list	1. Brunzel N. A. Fundamentals of Urine & Body Fluid Analysis. Elsevier 2021.

4. Objectives, content and learning outcomes

4.1. Course objectives (taking into account the form of classes)

Lectures

- **CO1.** Raising awareness of the role of laboratory diagnostics in medicine at various stages of medical treatment.
- **CO2.** Presentation of laboratory diagnostic usefulness in diagnosing and monitoring the treatment as well as risk assessment of different diseases.
- **CO3.** Shaping an attitude of good cooperation between the doctor and the laboratory.

Classes

- **CO1.** Acquaintance with analytical methods as a diagnostic tool.
- **CO2.** Presentation and discussing the importance of the proper collection of biological material for laboratory tests.

- **CO3.** Presentation of laboratory diagnostic usefulness in diagnosing and monitoring the treatment as well as risk assessment of different diseases.
- **CO4.** Gaining the ability to interpret the laboratory tests results.

4.2. Course content (taking into count the form of classes)

Lectures

1. Laboratory research as a tool in the diagnosis of diseases. Cooperation between doctor and medical laboratory.
2. The rules of functioning of medical diagnostic laboratory. Characteristics of the usefulness of diagnostic test.
3. Factors affecting laboratory tests results.
4. Laboratory diagnostics of disorders of white and red blood cell system.
5. Laboratory diagnostics of hemostasis disorders.
6. Laboratory diagnostics of endocrine disorders
7. Water-electrolyte balance disorders

Classes

1. The rules of collecting biological material for laboratory test.
2. Basic laboratory tests and methods used in general haematology.
3. Laboratory diagnostics of haematological malignancies. Microscopic evaluation of haematological disorders (peripheral blood and bone marrow smears).
4. Basic laboratory tests in coagulology and their diagnostic usefulness.
5. General urine examination (urine strip analysis and microscopic evaluation of urine sediment).
6. Acid-base balance disorders.
7. Disorders of exo and endocrine functions of the pancreas. Diabetes.
8. Laboratory diagnostics of liver disorders.
9. Laboratory research in the assessment of lipid metabolism. Cardiovascular risk management. Laboratory markers
   of coronary acute syndromes.
10. The usefulness of biochemical and immunodiagnostic tests in clinical practice.
11. The role of laboratory diagnostics in cancer – aspects of biochemical and molecular diagnostics.
12. Cerebrospinal fluid and other body fluids diagnostics.
13. Laboratory diagnostics in renal function disorders.
14. Laboratory diagnostics of autoimmune diseases.

4.3. Course learning outcomes

Course learning outcomes (code)	Upon completion of the course, the student	Alignment with programme learning outcomes
in the area of knowledge knows and understands:		
W01	Basic methods used in laboratory diagnostics, including electrophoresis of proteins and nucleic acids;	B.W14.
W02	Methods used in microbiological and parasitological diagnostics (indications, principles of conducting, interpretation of the result);	C.W15.
W03	Principles of diagnosis of infectious, allergic, autoimmune, cancer and blood diseases, based on the antigen-antibody reaction;	C.W16.
W04	Basic principles of diagnostic and therapeutic procedures in poisoning;	C.W37.

W05	Environmental and epidemiological factors, causes, symptoms, principles of diagnosis, and therapeutic management for the most common diseases in children and their complications: 1. Rickets, tetany, disturbances in water-electrolyte and acid-base balance; 2. Heart defects, myocarditis, endocarditis, pericarditis, cardiomyopathies, arrhythmias, heart failure, arterial hypertension, pulmonary hypertension, syncope; 3. Respiratory system diseases and allergies, including congenital respiratory system defects, bronchiectasis, respiratory infections, tuberculosis, cystic fibrosis, asthma, allergic rhinitis, urticaria, atopic dermatitis, anaphylactic shock, angioedema; 4. Anemia, bleeding disorders, bone marrow failure, childhood cancers, including typical solid tumors of childhood, primary and secondary immunodeficiencies; 5. Acute and chronic abdominal pain, vomiting, diarrhea, constipation, gastrointestinal bleeding, peptic ulcer disease, inflammatory bowel diseases, pancreatic disorders, cholestasis, liver diseases, food allergies, congenital gastrointestinal defects; 6. Acute kidney injury, chronic kidney disease, urinary tract infections, urinary disorders, congenital urinary system defects, vesicoureteral reflux disease, kidney stones, glomerular diseases, tubulointerstitial diseases (tubulopathies, renal tubular acidosis), genetically determined kidney diseases, renovascular hypertension; 7. Growth disorders, thyroid and parathyroid diseases, adrenal gland disorders, diabetes, obesity, puberty disorders, gonadal function disorders; 8. Cerebral palsy, encephalitis, meningitis, seizures, epilepsy; 9. The most common infectious diseases in childhood; 10. Systemic connective tissue diseases, including juvenile idiopathic arthritis, systemic lupus erythematosus, dermatomyositis, systemic vasculitis, and other causes of musculoskeletal pain (non-inflammatory, infectious and reactive arthritis, and juvenile spondyloarthropathies).	E.W3.
W06	Types of biological materials used in laboratory diagnostics and principles of sample collection for testing;	E.W39.
W07	Possibilities and limitations of laboratory tests;	E.W40.

in the area of skills knows how to:

U01	Use basic laboratory and molecular techniques;	B.U12.
U02	Make connection between images of tissue, organ damage and clinical symptoms of the disease, medical history and the results of laboratory determinations in order to establish the diagnosis of the most common diseases of adults and children;	C.U7.
U03	Perform medical procedures and treatments, including: 1. Measurement and assessment of basic life functions (temperature, pulse, blood pressure) and monitoring them using a cardiac monitor and pulse oximeter; 2. Various forms of inhalation therapy and selecting an inhaler appropriate for the patient's clinical condition; 3. Measurement of peak expiratory flow; 4. Oxygen therapy using non-invasive methods; 5. Instrumental and non-instrumental airway clearance 6. Intravenous, intramuscular, and subcutaneous drug administration; 7. Collection and securing of blood for laboratory and microbiological testing; 8. Collection of arterial and arterialized capillary blood; 9. Collection of swabs for microbiological and cytological examinations; 10. Urinary catheterization in both females and males;	E.U14.

	11. Placement of a nasogastric tube; 12. Administration of an enema; 13. Performing a standard resting electrocardiogram and interpreting its results; 14. Defibrillation, electrical cardioversion, and external pacing; 15. Strip tests, including measuring glucose levels using a glucometer; 16. Pleural procedures: thoracentesis and pneumothorax decompression; 17. Anterior nasal packing; 18. Ultrasound examination in life-threatening situations according to the FAST protocol (Focused Assessment with Sonography in Trauma) or its equivalent, and interpreting its results;	
U04	Use of appropriate personal protective equipment according to the clinical situation;	E.U15.
U05	Apply principles of providing feedback (constructive, non-judgmental, descriptive) within team collaboration;	E.U30.
U06	Accept, clarify, and analyze one's own role and scope of responsibility in the team, and recognize one's role as a doctor in the team;	E.U31.
U07	Obtain information from team members respecting their diverse opinions and specialized competencies, and incorporate this information into the patient's diagnostic and therapeutic plan;	E.U32.
U08	Discuss patient situations in the team without subjective judgments, respecting patient dignity	E.U33.
U09	The following protocols should be applied (e.g., during the handover of patient care, ordering a patient consultation, or providing one): 1. ATMIST (A (Age), T (Time of injury), M (Mechanism of injury), I (Injury suspected), S (Symptoms/Signs), T (Treatment/Time to arrival)); 2. RSVP/ISBAR (R (Reason for the call), S (Story of the patient), V (Vital signs), P (Plan for the patient)/I (Introduction), S (Situation), B (Background), A (Assessment), R (Recommendation))."	E.U34.

in the area of social competences is able to:

K01	Establish and maintain deep and respectful contact with the patient and show understanding towards ideological and cultural differences;	K.S1.
K02	Do what is right for the patient;	K.S2.
K03	Respect medical confidentiality and patient’s rights;	K.S3.
K04	Take actions concerning the patient on the basis of ethical principles, being aware of social conditions and restrictions resulting from illness;	K.S4.
K05	Recognize his/her own limitations and self-evaluate educational deficiencies and needs;	K.S5.
K06	Promote healthy lifestyle;	K.S6.
K07	Use reliable information sources;	K.S7.
K08	Conclude on the basis of own surveys and observations;	K.S8.
K09	Introduce rules of social conduct and teamwork to the group of specialists, including specialists form other medical professions also in the multicultural and multinational environment;	K.S9.
K10	Give opinions concerning various aspects of professional activity;	K.S10.
K11	Take responsibility for own decisions made during professional activities including own safety and safety of other people.	K.S11.

4.4. Assessment methods for learning outcomes

Assessment method (+/-)

Course learning outcomes (code)	Oral/written/ practical examinaion /other (specify)*	Test*	Project*	In-class activity*	Independent study*	Group work*	Other Observation*

Type of classes

1: / 2:	L	C	...	L	C	...	L	C	...	L	C	...	L	C	...	L	C	...	L	C	...
W01-W07	+	+		+	+																
U01-U09																					
K01-K11																			+	+	

Annotation. 1: form of classes; 2: learning outcomes

4.5. Assessment criteria for learning outcomes

Type of classes:

LECTURE (L) (including classes conducted with the use of distance learning methods and techniques)

Grade	Assessment criteria
3,0	Class attendance, exam test for given grade 61% - 68%
3,5	Class attendance, exam test for given grade 69% - 76%
4,0	Class attendance, exam test for given grade 77% - 84%
4,5	Class attendance, exam test for given grade 85% - 92%
5,0	Class attendance, exam test for given grade 93% - 100%

Type of classes:

CLASSES (C) (including classes conducted with the use of distance learning methods and techniques)

Grade	Assessment criteria
3,0	Class attendance, active participation, partial credit tests for given grade 61% - 68%
3,5	Class attendance, active participation, partial credit tests for given grade 69% - 76%
4,0	Class attendance, active participation, partial credit tests for given grade 77% - 84%
4,5	Class attendance, active participation, partial credit tests for given grade 85% - 92%
5,0	Class attendance, active participation, partial credit tests for given grade 93% - 100%

5. ECTS credit allocation – student workload

Category	Student workload (full-time mode)	Student workload (part-time mode)
NUMBER OF HOURS WITH THE DIRECT PARTICIPATION OF THE TEACHER (CONTACT HOURS)	**55**	
Participation in lectures*	15	
Participation in seminars/laboratories*	40	
Other (specify) e.g. classes conducted with the use of distance learning methods and techniques*		
INDEPENDENT STUDY (NON-CONTACT HOURS)	**45**	
Preparation for lectures*	10	
Preparation for seminars/laboratories*	35	
Preparation for examination/test*		

Gathering materials for project, online research*		
Preparation of a multimedia presentation*		
Other (specify)*		
TOTAL HOURS		
ECTS CREDITS for the course		

*** delete as appropriate**

Approved for implementation (date and legible signatures of course instructors in the given academic year):

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