**SYLLABUS**

**regarding the qualification cycle FROM 2022 TO 2023**

1. Basic Course/Module Information

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| Course/Module title | Clinical Biochemistry for Nurses  |
| Course/Module code \* | BCh/B |
| Faculty (name of the unit offering the field of study) | College of Medical Sciences, University of Rzeszów |
| Name of the unit running the course | Department of Biochemistry and General Chemistry |
| Field of study | Nursing |
| Qualification level  | Uniform master studies |
| Profile | General academic |
| Study mode | Stationary/ non- stationary |
| Year and semester of studies |  |
| Course type | Obligatory |
| Language of instruction | English |
| Coordinator | Dr hab. n.med. David Aebisher, Prof UR |
| Course instructor | Dr hab. n.med. David Aebisher, Prof UR |

\* - as agreed at the faculty

1.1.Learning format – number of hours and ECTS credits

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Semester(n0.) | Lectures | Classes | Colloquia | Lab classes | Seminars | Practical classes | Internships | others | **ECTS credits**  |
|  | 10 |  |  |  |  |  |  |  | 2 |

1.2. Course delivery methods

- conducted in a traditional way

- involving distance education methods and techniques

1.3. Course/Module assessment (exam, pass with a grade, pass without a grade)

2. Prerequisites

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| High school graduation knowledge in biology, genetics and embryology. |

3. Objectives, Learning Outcomes, Course Content, and Instructional Methods

3.1. Course/Module objectives

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| O1 | Understanding chemical equilibria, kinetics and chemical thermodynamics in aqueoussolutions |
| O2 | Knowledge of the chemical formulas of amino acids, carbohydrates and lipids ofphysiological significance and the ability to use them, including records of metabolicchanges |
| O3 | Ability to use laboratory equipment, perform chemical and biochemical experimentsaccording to the procedures described in the instructions for laboratory exercises |
| O4 | Ability to use metabolic transformation patterns (pathways) in the field of proteinsynthesis and degradation, carbohydrate, fat and fatty acid metabolic pathways, alongwith regulation and its disorders |

3.2. Course/Module Learning Outcomes (to be completed by the coordinator)

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| --- | --- | --- |
| Learning Outcome | The description of the learning outcome defined for the course/module | Relation to the degree programme outcomes |
| LO\_01 | The student knows and understands the acid-base balance and mechanism of action of buffers and theirimportance in systemic homeostasis; | A.W9 |
| LO\_02 | The student knows and understands the concepts of solubility, osmotic pressure, isotonic solutions, colloidalsolutions and Gibbs-Donnan equilibrium; | A.W10 |
| LO\_03 | The student knows and understands the structure of lipids and polysaccharides and their functions in cellularand extracellular structures; | A.W11 |
| LO\_04 | The student knows and understands the I-, II-, III- and IV-order structures of proteins as well as post-translational and functional modifications of proteins and theirmeaning; | A.W12 |
| LO\_05 | The student knows and understands the functions of nucleotides in the cell, the structure of primary and secondary DNA and RNA, and the structure ofchromatin; | A.U4 |
| LO\_06 | The student knows and understands metabolic profiles of basic organs and systems; | K\_K05 |
| LO\_07 | Student is able to calculate the solubility of inorganic compounds, determine the chemical basis of the solubility of organic compounds or its absence and its practical importancefor dietetics and therapy; | K\_K07 |

**3.3. Course content (to be completed by the coordinator)**

1. Lectures

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| Content outline |
| - |

1. Classes, tutorials/seminars, colloquia, laboratories, practical classes

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| Content outline  |
| 1.Water and pH, overview of organic chemistry, covalent vs ionic bonds,VSEPR mode |
| 2. Myoglobin and hemoglobin |
| 3. Enzymes: mechanism of action |
| 4. Enzyme regulation of Activities / Transition metals |
| 5. Metabolism of glycogen/gluconeogenesis |

3.4. Methods of Instruction

Exercises: group work, problem solving, designing and conducting experiments, discussion

4. Assessment techniques and criteria

4.1 Methods of evaluating learning outcomes

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| --- | --- | --- |
| Learning outcome | Methods of assessment of learning outcomes (e.g. test, oral exam, written exam, project, report, observation during classes) | Learning format (lectures, classes,…) |
| LO-01, LO-02, LO-03, LO-04, LO-05, LO-06, LO-07, | Observation during classes, test, oral answer | Classes |

4.2 Course assessment criteria

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| Classes: written testAssessment criteria:5.0 - the student shows knowledge of the content of education at the level of 93% -100%4.5 - the student shows knowledge of the content of education at the level of 85% -92%4.0 - the student shows knowledge of the content of education at the level of 77% -84%3.5 - the student shows knowledge of the content of education at the level of 69% -76%3.0 - the student shows knowledge of the content of education at the level of 60% -68%2.0 - the student shows knowledge of the content of education below 60%A positive grade for a subject can only be obtained on the condition of obtaining a positive grade for each of the established learning outcomes. |

5. Total student workload needed to achieve the intended learning outcomes

– number of hours and ECTS credits

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| --- | --- |
| Activity | Number of hours |
| Scheduled course contact hours | 10 |
| Other contact hours involving the teacher (consultation hours, examinations) | 30 |
| Non-contact hours - student's own work (preparation for classes or examinations, projects, etc.) | 85 |
| Total number of hours | 125 |
| Total number of ECTS credits | 2 |

6. Internships related to the course/module

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| --- | --- |
| Number of hours | *-* |
| Internship regulations and procedures | *-* |

7. Instructional materials

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| Compulsory literature:1. Michael A. Lieberman, Rick Ricer. BRS Biochemistry, Molecular Biology, and Genetics. Wolters Kluwer Health (JL). 2020.
2. Genetics Essentials: Concepts and Connections. Benjamin A. Pierce. Ed. 4. New York: W.H. Freeman and Company. 2018.
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| Complementary literature: 1. Cancer Genomics for the Clinician. Ramaswamy Govindan, Siddhartha Devarakonda. New York: Demos Medical Publishing. 2019.
2. From gene to therapy : understanding human disease through genetics. Michael Dean. [San Rafael, California]: Morgan & Claypool. 2017. Color Atlas of Genetics. Eberhard Passarge. Georg Thieme (JL). 2017.
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Approved by the Head of the Department or an authorised person