**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 aqueous  solutions |
| O2 | Knowledge of the chemical formulas of amino acids, carbohydrates and lipids of  physiological significance and the ability to use them, including records of metabolic  changes |
| O3 | Ability to use laboratory equipment, perform chemical and biochemical experiments  according to the procedures described in the instructions for laboratory exercises |
| O4 | Ability to use metabolic transformation patterns (pathways) in the field of protein  synthesis and degradation, carbohydrate, fat and fatty acid metabolic pathways, along  with 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 their  importance in systemic homeostasis; | A.W9 |
| LO\_02 | The student knows and understands the concepts of solubility, osmotic pressure, isotonic solutions, colloidal  solutions and Gibbs-Donnan equilibrium; | A.W10 |
| LO\_03 | The student knows and understands the structure of lipids and polysaccharides and their functions in cellular  and 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 their  meaning; | 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 of  chromatin; | 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 importance  for 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 test  Assessment 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. |
| 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. |

Approved by the Head of the Department or an authorised person