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FACULTY OF MEDICINE

Approved:
Dean:
(Prof. Yoto Yotov, MD, PhD)

SYLLABUS

IN
BIOCHEMISTRY

Specialty	**MEDICINE**
Educational - qualification degree	**master**
Organizational form of education	**full-time**
Auditorial activity (Lectures/Seminars)	**120 (90/90)**
Extra-auditorial activity	**300**
ECTS- credits	**16**
Discipline type	**compulsory**
Semester/s of education	**third and forth**
Semester of examination	**fourth**
Developer(s) of the Syllabus:	**Prof. Diana Ivanova, DSc and prof. Milka Nashar, PhD**

Varna, 2025

ANNOTATION

Aims of the course	Biochemistry is a science of the molecular basis of life. The biochemistry course is offered as a compulsory course in Medical University – Varna for students in Medicine. This course is a logical follow-up of the courses in chemistry and biology. Students should have basic knowledge on the fundamental characteristics of life at molecular level: the structure-function relationship in the cells and the mechanisms of genetic information transfer, ontogenesis and cells differentiation. The biochemistry course aims to develop in the students a new vision for biochemistry as an integral part of general knowledge, particularly in medicine. The scope of this course is to introduce the students to the unity and diversity of the organisms, based on the same common precursors of macromolecules, and to the specificity of biological polymers, their diversity in different species and structure-function relationship. Special emphasis is put on relationship between metabolism, regulatory mechanisms and mechanisms for energy yield and storage. An important objective of the course is make the students familiar with the modern techniques and approaches for biochemical and molecular analyses investigations and their application in human medicine. The training materials consist of lectures placed on the Blackboard platform, as well as seminar quizzes and clinical cases, collected in a textbook. Complementary materials include curriculum-programs, syllabus, schedules of classes etc.

Outcomes for students at the end of the course:	
Competences	
Competence group	1. **Patient Care** that is compassionate, appropriate, and effective for treating health problems and promoting health.
Knowledge	▪ Gather essential and accurate information about the patient based on knowledge about the metabolism in norm and in pathologies
Skills	▪ Make informed diagnostic and therapeutic decisions
Competence group	2. **Medical Knowledge** about established and evolving biomedical, clinical, and cognate (eg, epidemio-logical and social-behavioral) sciences and the application of this knowledge to patient care.
Knowledge	▪ To acquire new scientific knowledge about the molecular mechanisms, interrelationships and regulation of basic metabolic processes at the cellular, tissue and organ level, which will allow to understand and make sense of the applied therapeutic approaches.
Skills	▪ To undestand the basic concepts and models of functioning of living matter. ▪ To apply a research and analytical approach to solving clinical and scientific problems.

	▪ To apply medical and scientific knowledge in clinical situations, interpreting results of biochemical studies
Competence group	**3. Practice-Based Learning and Improvement** that involves investigation and evaluation of their own patient care, appraisal, and assimilation of scientific evidence, and improvements in patient care.
Knowledge	▪ To extract important information about the functioning of living organisms in their interaction with environmental factors to maintain health.
Skills	• investigate and evaluate patient care practices • appraise and assimilate scientific evidence, and • improve the practice of medicine.
Competence group	**4. Interpersonal and Communication Skills** that result in effective information exchange and teaming with patients, their families, and other health professionals.
Knowledge	▪ Understand the importance of information exchange between doctor and patient and communication with other healthcare professionals
Skills	• Work effectively as a member of a health care team
Competence group	**5. Professionalism,** as manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.
Knowledge	▪ Knowledge about the role of independent and lifelong learning
Skills	• Pursuing Continual Personal and Professional Growth

Key competencies for lifelong learning[1], that the discipline develops:	
Literacy competence Literacy is the ability to identify, understand, express, create, and interpret concepts, feelings, facts and opinions in both oral and written forms, using visual, sound/audio and digital materials across disciplines and contexts. It implies the ability to communicate and connect effectively with others, in an appropriate and creative way.	**X**

[1] As defined in 2018 r. by the European Union Council (https://eur-lex.europa.eu/legal-content/BG/TXT/HTML/?uri=CELEX:32018H0604(01)&from=EN)

Multilingual competence This competence defines the ability to use different languages appropriately and effectively for communication. It broadly shares the main skill dimensions of literacy: it is based on the ability to understand, express and interpret concepts, thoughts, feelings, facts and opinions in both oral and written form (listening, speaking, reading and writing) in an appropriate range of societal and cultural contexts according to one's wants or needs.	
Mathematical competence and competence in science, technology, engineering A. Mathematical competence is the ability to develop and apply mathematical thinking and insight in order to solve a range of problems in everyday situations. Building on a sound mastery of numeracy, the emphasis is on process and activity, as well as knowledge. Mathematical competence involves, to different degrees, the ability and willingness to use mathematical modes of thought and presentation (formulas, models, constructs, graphs, charts). B. Competence in science refers to the ability and willingness to explain the natural world by making use of the body of knowledge and methodology employed, including observation and experimentation, in order to identify questions and to draw evidence-based conclusions. Competences in technology and engineering are applications of that knowledge and methodology in response to perceived human wants or needs. Competence in science, technology and engineering involves an understanding of the changes caused by human activity and responsibility as an individual citizen.	**X**
Digital competence Digital competence involves the confident, critical and responsible use of, and engagement with, digital technologies for learning, at work, and for participation in society. It includes information and data literacy, communication and collaboration, media literacy, digital content creation (including programming), safety (including digital well-being and competences related to cybersecurity), intellectual property related questions, problem solving and critical thinking.	**X**
Personal, social and learning to learn competence Personal, social and learning to learn competence is the ability to reflect upon oneself, effectively manage time and information, work with others in a constructive way, remain resilient and manage one's own learning and career. It includes the ability to cope with uncertainty and complexity, learn to learn, support one's physical and emotional well-being, to maintain physical and mental health, and to be able to lead a health-conscious, future-oriented life, empathize and manage conflict in an inclusive and supportive context.	**X**
Citizenship competence the ability to act as responsible citizens and to fully participate in civic and social life, based on an understanding of social, economic, legal and political concepts and structures, as well as global developments and sustainability.	
Entrepreneurship competence Entrepreneurship competence refers to the capacity to act upon opportunities and ideas, and to transform them into values for others. It is founded upon creativity, critical thinking and problem solving, taking initiative and perseverance and the ability to work collaboratively in order to plan and manage projects that are of cultural, social or financial value.	**X**
Cultural awareness and expression competence Competence in cultural awareness and expression involves having an understanding of and respect for how ideas and meaning are creatively expressed and communicated in different cultures and through a range of arts and other cultural forms. It involves being engaged in understanding, developing and expressing one's own ideas and sense of place or role in society in a variety of ways and contexts.	

Methods of education
▪ lectures ▪ seminars ▪ practicals and laboratory exercises, practical and clinical problem solving, case studies, consultations, discussions, work with scientific literature, databases, analyses, and presentations.

Links with other courses from the curriculum of the specialty
▪ **Builds upon knowledge acquired in/Depends on:** ○ Biology

- Chemistry
- Biophysics

- **Necessary for the following disciplines:**
  -
- **Other related disciplines:**
  - Anatomy and histology
  - Cytology, General Histology and Embryology
  - Human Physiology
  - Pathophysiology
  - Pharmacology
  - Clinical Pharmacology
  - Medical Genetics
  - Clinical Laboratory
  - Clinical Immunology