

SYLLABUS

1. Course title:

PHYSICAL CHEMISTRY

2. Code:**3. Cycle of study:**

1

4. ECTS credits:

5

5. Type of course: Mandatory Elective**6. Prerequisites:**

None

7. Class restrictions:

None

8. Duration / semester: 1 3**9. Weekly contact hours:**

9.1. Lectures:

3

9.2. Seminars:

0

9.3. Laboratory/Practice classes:

1

10. Faculty:

Faculty of Pharmacy

11. Department/study program:

Pharmacy (integrated academic study I and II cycle)

12. Lecturer:

Prof.dr.sc. Husejin Keran

13. Lecturer's e-mail:

husejin.keran@untz.ba

14. Web site:

www.frmf.untz.ba

15. Course aims:

The main goal of the course is for students to acquire theoretical and practical knowledge of the physico-chemical quantities needed to describe the state of the system, physico-chemical processes, their kinetics, balance, as well as to get to know the key laws that describe the direction of changes in the state of the system.

16. Learning outcomes:

Creating a clearer picture of the structure of matter and thermodynamic quantities that characterize the state of the system and changes in the state of the system, more precisely in systems, kinetics, electrochemical properties and the development of reactions in electrochemistry.

Through practical exercises designed in the form of short research experiments, students gain independence in solving practical problems.

17. Course content:

Methods of physical and chemical research. The structure of matter. Development of the theory of atomic structure. Structure within compounds. The nucleus in chemistry and the concept of radioactivity. Gaseous state of matter - ideal and real gases. Kinetic theory of gases. Maxwell - Boltzmann distribution. Molar heat capacity of gas. Transport properties of gases. Solid state of matter. Crystalline state. Crystal structure testing methods. Liquid state of matter. Colligative properties of solutions. 4 Chemical energetics - thermodynamic functions. And the law of thermodynamics. Enthalpy. Standard enthalpy change. Dependence of reaction enthalpy on temperature. Second law of thermodynamics. Entropy. Reversibility and irreversibility. The third law of thermodynamics. Free energy and balance. Gibbs energy. Change in Geiss energy with pressure at constant temperature. Using the Gibbs function. Helmholtz energy - isothermal isochoric process. Thermodynamic potential. Chemical potential of a solid or liquid substance.

18. Learning methods:

1. Lectures
2. Exercises
3. Consultations

19. Assessment methods:

The written exam consists of three tests and a final exam.

20. Assessment components:

Class attendance and activity	max. 10 points
Colloquium 1	6 points (max. 10)
Colloquium 2	6 points (max. 10)
I test	9 points (max. 16.7)
II test	9 points (max. 16.7)
III test	9 points (max. 16.7)
Final exam	10 points (max. 20)

21. Required reading list:

1. S.Đ.Đorđević,V.J.Dražić:»Fizička hemija«,Tehnološko – Metalurški fakultet Beograd, 2006.
2. P.W. Atkins:»Physical Chemistry«, Oxford University,2007.
3. 1. P.W.Atkins,M.J.Clugston:»Načela Fizikalne kemije«, Školska knjiga

22. Web sources:**23. Applicable starting from the academic year:**

2018/2019

24. Adopted in the Faculty/Academy session:

17.11.2025.