

**86S1-PCHF1**

**FUNDAMENTALS OF PHYSICAL CHEMISTRY I**

**ECTS: 4.0**

**HOURS PER SEMESTER/WEEK:** LECTURES: 30/2; CLASSES: 45/3

**FIELD OF THE STUDY:** Chemistry

**Level of study:** First-cycle (Bachelor's degree) program

**Course status:** obligatory \*

**Year of the study:** I

#### **COURSE CONTENTS**

**LECTURES:** Basic thermodynamic functions, equilibria in reacting systems, phase transitions, chemical kinetics, equilibria in electrolyte solutions, activity of electrolytes, conductivity of electrolyte solutions, electrode potentials, membrane potentials, electrochemical energy sources, adsorption.

**CLASSES:** Heat of chemical reactions, equilibria in electrolyte solutions, determination of dissociation constants by pH and conductivity methods, determination of solubility product, determination of activity coefficients, determination of isoelectric point of colloids, chemical kinetics, adsorption, equilibria in multi-component systems, phase transitions.

**EDUCATIONAL PURPOSE:** Learning the fundamentals of physical chemistry.

#### **LEARNING OUTCOMES**

**Knowledge.** The student knows the physicochemical phenomena in the scope presented during lectures and classes.

**Skills.** Student can operate laboratory equipment, he understands issues in the field of physical chemistry, he can determine physicochemical parameters and apply statistical methods of experimental data analysis.

**Social competences.** Student understands the need for lifelong learning. Can work in a group, performing various functions in it.

#### **TEACHING FORMS AND METHODS**

**Lectures.** Lecture with multimedia presentation.

**Classes.** Laboratory classes - performing laboratory tasks in small teams of 2.

#### **FORM AND CONDITIONS FOR VERIFICATION OF LEARNING OUTCOMES**

**Lectures.** Written test - credit with a grade.

**Classes.** Execution and completion of reports on the experiments performed. Oral/written test- credit with grade.

#### **BASIC LITERATURE**

1) Atkins P.W. 2003. Chemia fizyczna, PWN, Warszawa 2) Atkins P., de Paula J. 2016. Chemia fizyczna, PWN, Warszawa. 3) Pigoń K., Ruziewicz K. 2005. Chemia fizyczna. 1. Podstawy fenomenologiczne i 2. Fizykochemia molekularna, PWN, Warszawa 4) Buchowski H., Ufnalski W. 1994. Podstawy termodynamiki, WNT Warszawa

#### **ADDITIONAL LITERATURE**

1) L. Smoczyński, S. Kalinowski, J. Wasilewski, F. Karczyński 2000. Podstawy chemii fizycznej z ćwiczeniami, Wydawnictwo UWM

#### **THE TEACHER/TEACHERS CONDUCTING THE CLASSES:**

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