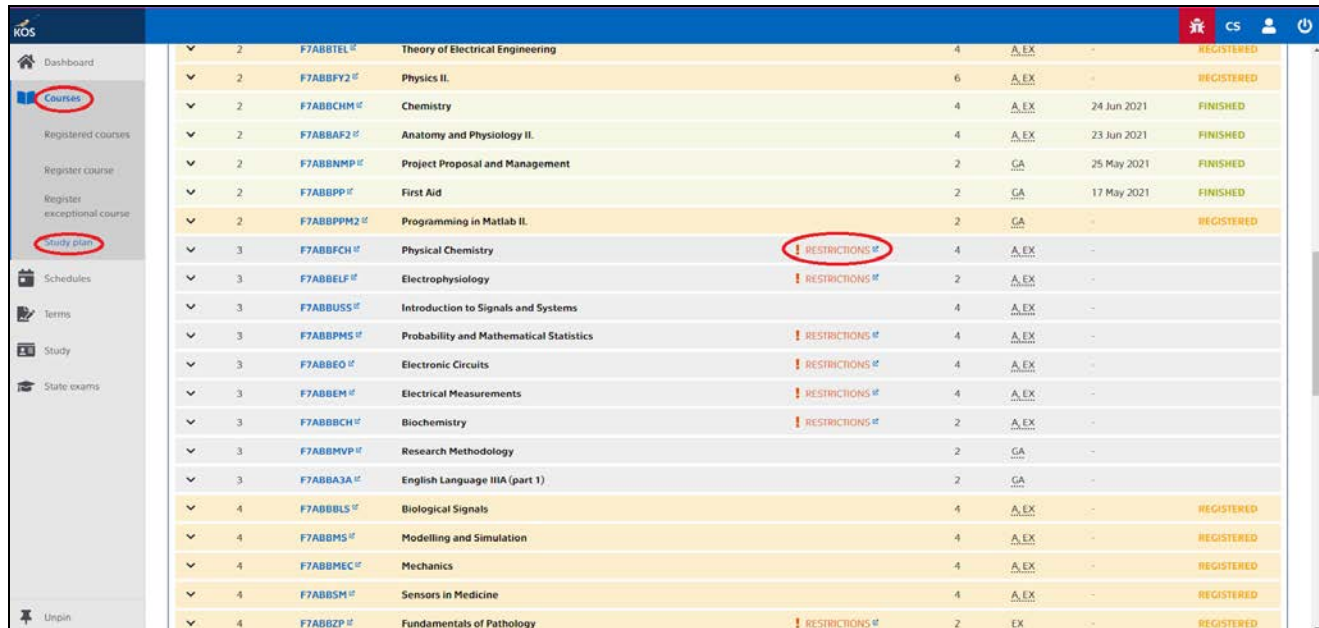


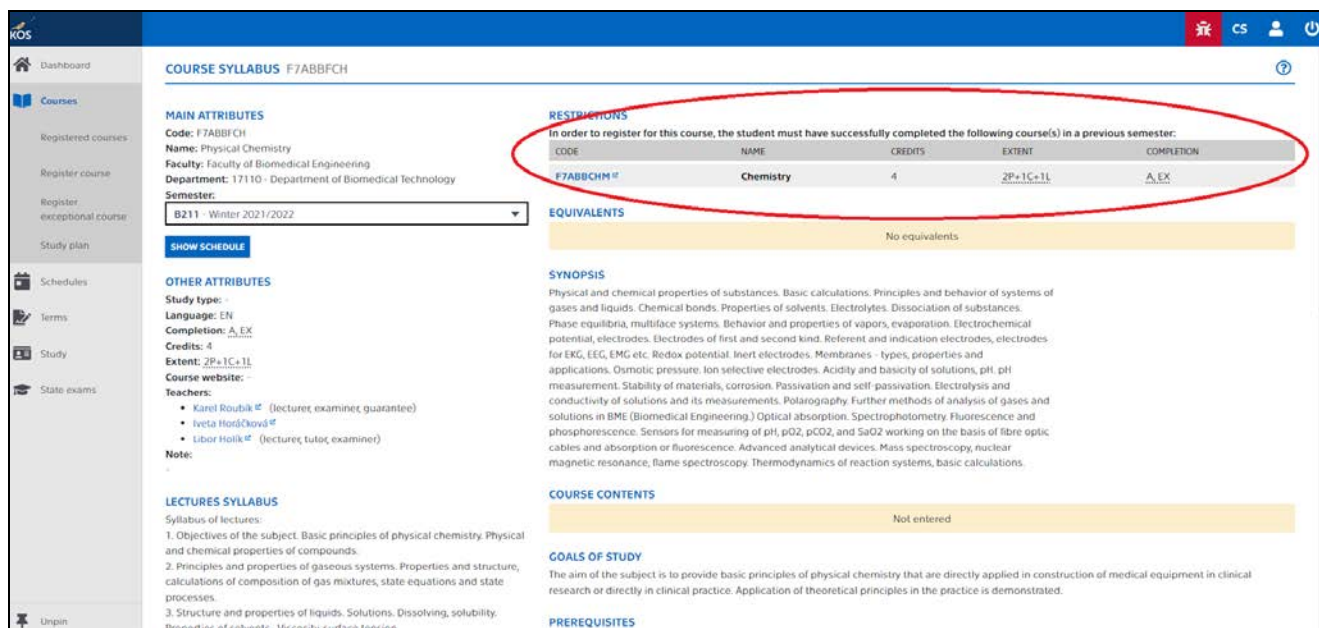
## HOW to PREREQUISITES (New web KOS)

Login into KOS: <https://www.kos.cvut.cz/>. After logging into the system, follow the pictures:



Code	Name	Credits	Extent	Completion	Status
F7ABTEL	Theory of Electrical Engineering	4	A, EX	-	REGISTERED
F7ABFY2	Physics II.	6	A, EX	-	REGISTERED
F7ABCHM	Chemistry	4	A, EX	24 Jun 2021	FINISHED
F7ABAF2	Anatomy and Physiology II.	4	A, EX	23 Jun 2021	FINISHED
F7ABNMP	Project Proposal and Management	2	CA	25 May 2021	FINISHED
F7ABPP	First Aid	2	CA	17 May 2021	FINISHED
F7ABPPM2	Programming in Matlab II.	2	CA	-	REGISTERED
F7ABFCH	Physical Chemistry	4	A, EX	-	RESTRICTIONS
F7ABELF	Electrophysiology	2	A, EX	-	RESTRICTIONS
F7ABUSS	Introduction to Signals and Systems	4	A, EX	-	RESTRICTIONS
F7ABPMS	Probability and Mathematical Statistics	4	A, EX	-	RESTRICTIONS
F7ABEO	Electronic Circuits	4	A, EX	-	RESTRICTIONS
F7ABEM	Electrical Measurements	4	A, EX	-	RESTRICTIONS
F7ABBCH	Biochemistry	2	A, EX	-	RESTRICTIONS
F7ABMVP	Research Methodology	2	CA	-	RESTRICTIONS
F7ABBA3A	English Language IIIA (part 1)	2	CA	-	RESTRICTIONS
F7ABBLS	Biological Signals	4	A, EX	-	REGISTERED
F7ABMS	Modelling and Simulation	4	A, EX	-	REGISTERED
F7ABMEC	Mechanics	4	A, EX	-	REGISTERED
F7ABSM	Sensors in Medicine	4	A, EX	-	REGISTERED
F7ABZP	Fundamentals of Pathology	2	EX	-	REGISTERED

The prerequisite is for the course where it says: **RESTRICTIONS**



**COURSE SYLLABUS F7ABBFCH**

**MAIN ATTRIBUTES**  
Code: F7ABBFCH  
Name: Physical Chemistry  
Faculty: Faculty of Biomedical Engineering  
Department: 17110 - Department of Biomedical Technology  
Semester: B211 - Winter 2021/2022

**OTHER ATTRIBUTES**  
Study type: -  
Language: EN  
Completion: A, EX  
Credits: 4  
Extent: 2P+1C+1L  
Course website: -  
Teachers:  
• Karel Roubíek (lecturer, examiner, guarantor)  
• Iveta Horáková  
• Libor Holík (lecturer, tutor, examiner)  
Note: -

**LECTURES SYLLABUS**  
Syllabus of lectures:  
1. Objectives of the subject. Basic principles of physical chemistry. Physical and chemical properties of compounds.  
2. Principles and properties of gaseous systems. Properties and structure, calculations of composition of gas mixtures, state equations and state processes.  
3. Structure and properties of liquids. Solutions. Dissolving, solubility. Properties of solutions. Miscibility, surface tension.

**RESTRICTIONS**  
In order to register for this course, the student must have successfully completed the following course(s) in a previous semester:

CODE	NAME	CREDITS	EXTENT	COMPLETION
F7ABCHM	Chemistry	4	2P+1C+1L	A, EX

**EQUIVALENTS**  
No equivalents

**SYNOPSIS**  
Physical and chemical properties of substances. Basic calculations. Principles and behavior of systems of gases and liquids. Chemical bonds. Properties of solvents. Electrolytes. Dissociation of substances. Phase equilibria, multicomponent systems. Behavior and properties of vapors, evaporation. Electrochemical potential, electrodes. Electrodes of first and second kind. Referent and indication electrodes, electrodes for EKG, EEG, EMG etc. Redox potential. Inert electrodes. Membranes - types, properties and applications. Osmotic pressure. Ion selective electrodes. Acidity and basicity of solutions, pH, pH measurement. Stability of materials, corrosion. Passivation and self-passivation. Electrolysis and conductivity of solutions and its measurements. Polarography. Further methods of analysis of gases and solutions in BME (Biomedical Engineering.) Optical absorption. Spectrophotometry. Fluorescence and phosphorescence. Sensors for measuring of pH, pO<sub>2</sub>, pCO<sub>2</sub>, and SaO<sub>2</sub> working on the basis of fibre optic cables and absorption or fluorescence. Advanced analytical devices. Mass spectroscopy, nuclear magnetic resonance, flame spectroscopy. Thermodynamics of reaction systems, basic calculations.

**COURSE CONTENTS**  
Not entered

**GOALS OF STUDY**  
The aim of the subject is to provide basic principles of physical chemistry that are directly applied in construction of medical equipment in clinical research or directly in clinical practice. Application of theoretical principles in the practice is demonstrated.

**PREREQUISITES**