Karta przedmiotu / Course description

Informacje ogólne o przedmiocie / General information about the course	
1. Kierunek studiów / Major of study: **Biotechnology**	**2. Poziom kształcenia / Study level:** first cycle **3. Forma studiów / Form of study: seminars**
4. Rok / Year: 2022/2023	**5. Semestr / Semester: I**
6. Nazwa przedmiotu / Course name: Small and large molecule analysis for biotechnology	
7. Status przedmiotu / Course status: Facultative classes	
8. Jednostka realizująca przedmiot, adres, e-mail: **Name of Department, mailing address, e-mail:** **Department of General and Inorganic Chemistry, Faculty of Pharmaceutical Sciences in Sosnowiec, Medical University of Silesia**	
9. Treści programowe przedmiotu Course contents: Has the knowledge necessary to interpret the results of experiments on the basis of available databases and analytical results, the basics of chemical and physical theories in advanced analytical techniques, to independently plan the analysis and interpret its results.	
10. liczba godzin z przedmiotu / Number of hours for the course	**30**
11. liczba punktów ECTS dla przedmiotu / Number of ECTS points for the course	**3**
12. Formy i tematy zajęć / Forms and topics of classes This course is designed to cover multiple topics associated with pharmaceutical analysis including method development, validation (i.e., regulatory), instrumentation (i.e., mass spectrometry), sample preparation, and handling of biological and product samples. **12.2. Seminars** 1. Matrices, Sampling and Analysis in Drug Development 2. Data Analysis (Precision, Accuracy, Linearity, LOD, LOQ) 3. Analytical Method Validation 4. Sample Preparation Methods for Small Molecules 5. Chromatography: Theory and Applications 6. Pharmaceutical Analysis and Product Quality 7. Spectroscopic Methods 8. Immunoanalytical Methods 9. Sample Preparation Methods for Proteins 10. Mass spectrometry: ionization sources (ESI and MALDI) 11. Mass spectrometry: Analyzers 12. Triple quad LC-MS/MS (Small Molecule) 13. Triple quad LC-MS/MS (Large Molecule) 14. HRAM mass spectrometry 15. Summary	**Liczba godzin** **Number of hours** **30h** 1. 2 2. 2 3. 2 4. 2 5. 2 6. 2 7. 2 8. 2 9. 2 10. 2 11. 2 12. 2 13. 2 14. 2 15. 2
13. Literatura / Readings 1. Ciborowski P, Silberring J. Proteomic Profiling and Analytical Chemistry. Elsevier VA, Waltham, MA 02451, USA, 2013. 2. Pedersen-Bjergaard S, Gammelgaard B, Halvorsen TG, Introduction to Pharmaceutical Analytical Chemistry, 2 ed. Wiley, 2019.	

3. Lasking J, Lifshitz C, Principles of mass spectrometry applied to biomolecules. John Wiley & Sons, Inc. Homoken, New Jersey, 2006

14. Kryteria oceny – szczegóły / Detail evaluation criteria

Zgodnie z zaleceniami organów kontrolujących / In accordance with the recommendations of the inspection bodies

Zaliczenie przedmiotu - student osiągnął zakładane efekty uczenia się / Completion of the course – student has achieved the assumed learning outcomes

Szczegółowe kryteria zaliczenia i oceny z przedmiotu są zamieszczone w regulaminie przedmiotu / Detail criteria for completion and evaluation of the course are specified in the course regulations