

„ZATWIERDZAM”

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KARTA INFORMACYJNA PRZEDMIOTU/ZAJĘĆ
(wersja anglojęzyczna w przypadku przedmiotu/zajęć w j. angielskim)

nazwa przedmiotu	<i>nazwa przedmiotu w języku polskim</i>	<i>Second level of chromatography</i>
Kod przedmiotu		
Język wykładowy	Angielski	
Profil studiów		
Forma studiów	<i>stacjonarne</i>	
Poziom studiów	<i>studia ...II....stopnia /</i>	
Rodzaj przedmiotu	<i>wybieralny</i>	
Obowiązuje od naboru	<i>2022/2023</i>	
Forma zajęć, liczba godzin/rygor, razem godz., pkt ECTS	<i>Lectures: 14 hours / pass with grade laboratory exercises: 8 hours / pass without grade seminar: 8 hours / pass without grade, 30 hours, 2 ECTS</i>	
Przedmioty wprowadzające	<i>Instrumental analysis</i>	
Semestr/kierunek studiów	<i>semestr 2 / chemia</i>	
Autor	Prof. dr hab. inż. Zygfryd Witkiewicz	
Jednostka organizacyjna odpowiedzialna za przedmiot	<i>wtc@wat.edu.pl</i>	
Skrócony opis przedmiotu	the invention and history of chromatography. Gas, liquid and supercritical chromatography. Capillary electrophoresis. The significance and applications of chromatography	
Pełny opis przedmiotu (treści programowe)	1. History of chromatography and its contemporary significance - 1 h . 2. Theory of chromatographic process - 1 h. 3. Gas chromatography, instrumentation, columns, stationary phases, detectors, retention parameters, column efficiency, qualitative and quantitative analysis - 2 h. 4. Liquid column chromatography, instrumentation, columns, mobile phases, stationary phases, detectors - 2 h. 5. Hyphenated techniques - 1 h.. 6. Thin layer chromatography, instrumentation, chromatographic plates. chromatographic chambers, development of chromatograms, visualisation of chromatograms, qualitative and quantitative analysis - 1 h. 7. Supercritical fluid chromatography - 2 h. 7. Biochromatography - 2 h. 8. Capillary electrophoresis, instrumentation and application of this analytical technique 2 h. Laboratories Gas chromatography - 4 h	

	Liquid chromatography – 4 h Seminars Preparation and delivering a presentation – 8 h
Literatura	Podstawowa: Z. Witkiewicz, J. Kałużna-Czaplińska, <i>Podstawy chromatografii i technik elektromigracyjnych</i>, WNT, Warszawa 2018 Reverse phase HPLC, Macherey Nagel, 2012 W. Jennings, <i>Analytical gas chromatography</i>, Academic Press, 2002 Sz. Nyiredy, <i>Planar chromatography</i>, Springer, 2011 The LC handbook, Agilent Technologies, 2015
Efekty uczenia się	W1 / The student has extended knowledge of analytical chemistry of the selection of the analytical method, allowing for theoretical justification of the choice of the analytical method, determination of the chemical composition of substances or their mixtures / K_W11 W2 / The student knows classical and instrumental analytical methods, their capabilities and theoretical foundations. He knows the methods of checking the reliability of the results of quantitative chemical analysis and using statistical methods of evaluating the results of the analysis. He knows the tendencies of the development of analytical equipment /K_W12 . U1. The student is able to use scientific and research equipment to analyze mixtures and environmental samples /K_U06 . U2. The student is able to find the necessary information in literature, databases and other sources, knows the basic scientific journals in the field of chemistry and has the ability to evaluate the information obtained /K_U10. U3 / The student is able to independently plan and implement lifelong learning and help others in this area / K_U14. U4 / The student is able to interact with others in teamwork and take a leading role in teams/ K_U16 K1 / The student recognizes the importance of knowledge in solving problems and consulting experts in case of difficulties with self-solving problems / K_K01. K2 /The student is ready to fulfill social obligations, inspire and organize activities for the benefit of the social environment and initiate activities for the benefit of social interest / K_K02.
Metody i kryteria oceniania (sposób sprawdzania osiągnięcia przez studenta zakładanych efektów uczenia się)	The student should know problems which are delivered during lectures and, in some extent, got during unassisted studies. The student, after passing her or his seminars and laboratory exercises, is allowed to get credit. The credit is oral and covers the knowledge connected with chromatography which has been delivered and discussed during lectures, seminars and laboratory exercises. The effects W1 and W2 are checked when receiving credit. The effect U1 is verified during laboratory eXercises and effect U2 during seminars.
Bilans ECTS (nakład pracy studenta)	Activity/load 1. Participation in lectures / 14 hours 2. Independent study of lecture topics / 10 hours 3. Participation in laboratories / 8 hours 4. Independent preparation for laboratories / 6 hours 5. Participation in seminars / 8 hours 6. Independent preparation for seminars / 6 hours 7. Participation in consultations / 2 hours 8. Preparation for passing the course / 6 hours Hours / ects Total student workload: 60 hours. /2 Classes with teacher participation: 32 hours / 1 Activities related to scientific activity: 60 / 2

autor

kierownik
jednostki organizacyjnej odpowiedzialnej za przedmiot

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