

„ZATWIERDZAM”

.....

.....

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

nazwa przedmiotu	<i>Techniki detekcji materiałów niebezpiecznych</i>	<i>Hazardous materials detection technologies</i>
Kod przedmiotu	WTCCNCSM-HMDT	
Język wykładowy	angielski	
Profil studiów	ogólnoakademicki	
Forma studiów	stacjonarne	
Poziom studiów	studia II stopnia	
Rodzaj przedmiotu	wybieralny	
Obowiązuje od naboru	2022/2023	
Forma zajęć, liczba godzin/rygor, razem godz., pkt ECTS	np. W 6/+, C 16/+, L 8/+ razem: 30 godz., 2 pkt ECTS	
Przedmioty wprowadzające	General and inorganic chemistry/ knowledge of basic chemical laws Organic chemistry / Knowledge of the basic properties of organic compounds and chemical reactions Analytical chemistry and instrumental analysis / Knowledge of basic analytical techniques Chemical sensors / General knowledge of converting a "chemical" signal into an electrical signal Nuclear chemistry / radioactive hazards	
Semestr/kierunek studiów	II / chemia	
Autor	Dr inż. Edyta Budzyńska	
Jednostka organizacyjna odpowiedzialna za przedmiot	Wydział Nowych Technologii i Chemii	
Skrócony opis przedmiotu	<i>The objectives of the course is: to provide an introduction into the field of hazardous materials, to introduce the problems related to air monitoring, to familiarize students with various sampling and detection technologies for hazardous materials, to teach how to take a sample containing trace amounts of hazardous substances and analyse it, to teach how to prepare analytical reports.</i>	
Pełny opis przedmiotu (treści programowe)	LECTURES 1. Properties of hazardous materials and specifics of their analysis / 2-hours 2. Sampling and preparation for detection and identification of trace amounts of substances / 4 hours 3. Laboratory analysis of samples containing dangerous substances / 4 hours 4. Detection and determination of substances using field instruments / 4 hours	

	<p>LABORATORIES Students perform laboratory exercises on:</p> <ol style="list-style-type: none"> 1. Laboratory analysis of samples containing traces of hazardous substances (chemical warfare agents) / 4 hours 2. Operation and applications of portable detection devices / 4 hours <p>SEMINARS During the seminars, the following topics will be considered:</p> <ol style="list-style-type: none"> 1. Techniques used in the analysis of hazardous substances / 4 hours 2. On-site analysis of trace amounts of hazardous substances / 4 hours
Literatura	<p>Basic literature:</p> <ol style="list-style-type: none"> 1. Hazardous Materials Air Monitoring and Detection Devices, Chris Hawley, Delmar/Thomson Learning, 2002 - 134, sygn. III-18299/TWB.35 2. Field Detection Technologies for Explosives, Yin Sun, ILM Publications, 2010, 69492. <p>Supplementary literature :</p> <ol style="list-style-type: none"> 3. Detection Technologies for Chemical Warfare Agents and Toxic Vapors, Yin Sun, Kwok Y. Ong; CRC Press, 2005 4. Hazardous Materials Characterization: Evaluation Methods, Procedures, and Considerations; Donald A. Shafer, Wiley 2005 5. Emergency Characterization of Unknown Materials; Rick Houghton; Taylor & Francis, 2007.
Efekty uczenia się	<p><i>W1/Has well-established and extended knowledge of the chosen specialty./K_W02</i> <i>W2/Has the computer science and chemistry knowledge to effectively use commercial chemical packages and scientific information databases./K_W07.</i> <i>W3/Has extended knowledge in the field of analytical chemistry, allowing theoretical justification of the choice of analytical method and determination of the chemical composition of substances or their mixtures./K_W11</i> <i>W4/Knows classical and instrumental analytical methods, their analytical capabilities, and theoretical basis. Knows ways of checking the reliability of results from quantitative chemical analysis and statistical methods for evaluating the study results. Knows the tendencies development of analytical equipment./K_W12</i> <i>U1/Can plan and perform experimental tests or observations in a chemical laboratory using occupational health and safety principles, safe handling of chemicals, and selection and disposal of chemical waste K_U03.</i> <i>U2/Can use research and scientific equipment to analyze mixtures and environmental samples./K_U06</i> <i>U3/Can find the necessary information in professional literature, databases, and other sources, knows essential scientific journals in the field of chemistry and can assess the reliability of the information obtained K_U10.</i> <i>U4/Can interact with others in teamwork and take a leading role in teams./K_U16</i> <i>K1/Recognizes the importance of knowledge in problem-solving cognitive and practical and expert consultation in case of difficulty solving the problem yourself. Can critically evaluate the content received./K_K01</i> <i>K2/Is ready to fulfill social obligations, inspiring and organizing activities for the benefit of the environment and initiating action for the use of public interest./K_K02</i> <i>K3/Understands the social aspects of the practical application of acquired knowledge and skills (especially in business) and the related responsibility./K_K04</i></p>
Metody i kryteria oceniania (sposób sprawdzania)	<p>Students will be assessed based on their participation in the exercises, seminars, and written colloquium.</p>

osiągnięcia przez studenta zakładanych efektów uczenia się)	All laboratory exercises must be completed successfully to qualify for the written colloquium. The learning objectives W1, W2, W3, W4 and skills U1, U2, U3, and U4 are assessed during written colloquium and laboratories. The purpose of K1, K2, and K3 is assessed during seminars.
Bilans ECTS (nakład pracy studenta)	Activity/ hours 1. Participation in lectures / 14 2. Self-study of lectures / 14 3. Participation in laboratories / 8 4. Self-preparation for laboratories / 14 5. Participation in seminars / 8 6. Participation in the consultation / 2 Hours/ects Total student workload: 60 hours / 2 ECTS Classes with teachers: 32 hours / 1 ECTS Classes related to scientific work: 60 / 2 ECTS

autor

kierownik
jednostki organizacyjnej odpowiedzialnej za przedmiot

.....

.....