


KAPITAŁ LUDZKI
NARODOWA STRATEGIA SPÓJNOŚCI

 Projekt współfinansowany przez
Unię Europejską w ramach
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Społecznego

UNIA EUROPEJSKA
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Course title		ECTS code	
Introduction to Python programming		13.3.1295	
Name of unit administrating study			
null			
Studies			
faculty	field of study	type	second tier studies (MA)
Faculty of Chemistry	Chemistry	form	full-time
		specialty	all
		specialization	all
Teaching staff			
prof. dr hab. Cezary Czaplewski, profesor uczelni; dr hab. Adam Sieradzan, profesor uczelni; dr hab. Artur Giełdoń			
Forms of classes, the realization and number of hours		ECTS credits	
Forms of classes		5	
Laboratory classes, Lecture		Lecture – 15 h	
The realization of activities		Laboratory classes – 45 h	
classroom instruction		student's own work – 30 h	
Number of hours		tutorial classes – 35 h	
Lecture: 15 hours, Laboratory classes: 45 hours		TOTAL: 125 h – 5 ECTS	
The academic cycle			
2022/2023 winter semester			
Type of course		Language of instruction	
obligatory		english	
Teaching methods		Form and method of assessment and basic criteria for eveluation or examination requirements	
- Case studies in computer laboratory - multimedia-based lecture		Final evaluation	
		- Graded credit - Examination	
		Assessment methods	
		Lecture – exam with multiple-choice questions Laboratory classes – written reports	
		The basic criteria for evaluation	
		according to “Rules and regulations for studies at the University of Gdansk”	
		Lectures: passing the final exam in the form of a multiple-choice question test (a score of 50% or more required to pass the exam). Lab classes: the arithmetic mean of partial grades received during the semester for written reports on laboratory exercises	
Method of verifying required learning outcomes			
Written exam tests student's knowledge of Python programming language and abilities to design of a project using the Python programming language and chemistry-related algorithms. During the laboratory exercises, the student solves problems in writing (reports including codes in Python) or oral (oral answer) in the field programming in Python. (K_W05, K_W06) Assessment of the student's independent programming exercises, the correctness of the analysis of the algorithm and preparation of reports. (K_U02; K_U11) Method of verifying the acquisition of social competences: The student identifies the level of their knowledge and skills as well as the need for updating knowledge, continuous professional training, and personal development. (K_K01, K_K06)			
Required courses and introductory requirements			
A. Formal requirements			
None			

B. Prerequisites None	
Aims of education Ability to properly design basic algorithms, introduction to programming in Python	
Course contents Algorithms and data structures in Python. Review of the most important data structures that are helpful in programming, objects, expressions, and numerical types. Functions and scoping. Testing and debugging. Handling exceptions. Classes and object-oriented programming. The most important programming algorithms: approximate estimation of the complexity of algorithms, brute-force algorithms, divide and conquer algorithms, recursion. Versions of Python language, useful Python libraries: NumPy, Scipy.	
Bibliography of literature Literature required to pass the course John V. Guttag Introduction to Computation and Programming Using Python, MIT Press 2013 Extracurricular readings Svein Linge, Hans Petter Langtangen Programming for Computations – Python, Springer 2020 Joakim Sundnes Introduction to Scientific Programming with Python, Springer 2020	
The learning outcomes (for the field of study and specialization) K_W05: has extended knowledge in the field of the specialisation studied K_W06: applies mathematics to the extent necessary to understand, describe and model chemical processes of extended complexity K_U02: critically assesses the results of conducted, performed observations and theoretical calculations and discusses errors K_U11: communicates in a foreign language in accordance with the requirements specified for level B2 of the Common European Framework of Reference for Languages and can use specialist terminology K_K01: knows the limitations of her/his own knowledge; understands the need for further education and can inspire other people to do so K_K06: undertakes research tasks consciously and responsibly, understanding the social aspects of the practical application of the acquired knowledge and skills and the responsibility related to it	Knowledge The student defines the concept of the algorithm. Names and describes the types and the data structures of the Python programming language. Differentiates the Python control instructions. Characterizes the most important classes of algorithms.
	Skills The student designs simple algorithms, writes them using the Python programming language and then tests the obtained programs.
	Social competence The student develops the skills of accurate and logical thinking and inference. Learns the principles of working safely, responsibly, and efficiently using the workstations connected to the Internet. Develops the responsibility for his/her personal account on the workstation. Develops the ability of working in a team.
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