1.	**Field of study**	**Computer Science**
2.	Faculty	Faculty of Science and Technology
3.	Academic year of entry	2024/2025 (winter term)
4.	Level of qualifications/degree	first-cycle studies (in engineering)
5.	Degree profile	general academic
6.	Mode of study	part-time

7.	**General information about the module**
Module name	**Algorithmics 1**
Module code	W4-IN-N1-24-1-ALG1
Number of the ECTS credits	5
Language of instruction	Polish
Purpose and description of the content of education	The module aims to acquire knowledge and skills in the following educational content: 1. Elements of algorithmics: problem and specification; algorithm and various writing methods. 2. Analysis of algorithms. 3. Recursive algorithms. 4. Algorithm modelling techniques: divide and conquer, dynamic programming, greedy algorithms, searching with backtracking. 5. Analysis of selected search methods: linear search, binary search, interpolation search. The problem of choice (selection). Positional statistics. 6. Sorting algorithms.
List of modules that must be completed before starting this module (if necessary)	not applicable

8. Learning outcomes of the module

Code	Description	Learning outcomes of the programme	Level of competenc (scale 1-5)
K01	Is aware of the importance of an algorithm's computational complexity for the final efficiency of the entire system. He realizes that it affects not only the efficiency but also the safety of these systems.	IN_K01	3
U01	Can evaluate the adopted algorithmic solutions and assumed data structures. Has the ability to indicate the advantages and disadvantages of the adopted solutions.	IN_U08	2
U02	Can determine an algorithm's computational complexity. Can also compare a group of algorithms intended to solve a given problem, select the best algorithm, and reject algorithms that require too many computer resources to execute.	IN_U09	3
U03	Can design data structures and write the algorithmic part solving a given computational problem in pseudocode.	IN_U09	2
U04	Able to plan and complete various tasks on time.	IN_U01	3
W01	Knows methods for determining the computational complexity of algorithms. Knows the basic notations used to estimate the order of functions. Knows and understands the complexity classes of algorithms.	IN_W01	3
W02	Ma wiedzę z zakresu podstawowych paradygmatów konstruowania algorytmów, takich jak np.,,dziel i zwyciężaj''.	IN_W03	3
W03	Ma wiedzę z zakresu algorytmów sortujących. Zna i rozumie działanie wybranych prostych algorytmów sortujących jak i		

	algorytmów zaawansowanych, złożonych.	IN_W03	4
W04	Zna i rozumie wybrane metody wyszukujące.	IN_W03	4

9. Methods of conducting classes

Code	Category	Name (description)
a01	Lecture methods / expository methods	Formal lecture/ course-related lecture *a systematic course of study involving a synthetic presentation of an academic discipline; its implementation assumes a passive reception of the information provided*
a05	Lecture methods / expository methods	Explanation/clarification *explication involving the derivation of a predetermined theorem from other, already known ones, in the number of steps specified by the person teaching the course*
c02	Demonstration methods	Video show *reproducing a film or video material in its entirety or in fragments in order to illustrate the content taught in class, to submit it to analysis and evaluation or to use it as an exercise in image perception; a film/video can be a work of art, an illustration (also technical illustration) of a content/phenomenon/object, a private record of an action, a media image, etc.*
c07	Demonstration methods	Screen presentation *a presentation of synthetic image content using computer graphics, e.g., a series of slides or other multimedia forms, usually accompanied by a commentary; typical components of a screen presentation include text organized into bulleted points, charts, images and animations, sometimes sound effects or music; a multimedia illustration of course content presented in the form of a projected image*
e01	Practical methods	Laboratory exercise / experiment *[also conducted as fieldwork] a method of practical application of knowledge; implemented in three stages: the recognition of a problem induced by the task content, the formulation of the problem and the attempt to solve it accompanied by the assessment of the effects; the goal is to acquire skills, abilities and habits, and to consolidate the acquired knowledge so that it becomes operational; the laboratory method assumes greater independence of learners than carrying out an experiment*
e08	Practical methods	Practice-as-research *also conducted as fieldwork; an activity aimed at confronting the acquired theory with practice through its practical application; students situate themselves in the reality they observe, study and transform through the prism of the theory; the method of practical classes is dominated by the application of knowledge to solving practical tasks*
f01	Methods of self-learning	Self-education *a method which involves independent acquisition of knowledge, skills and social competences, extending their scope and quality; complementary to the learning process taking place in class; taking on the task of developing and adjusting qualifications on one's own; self-study*
f02	Methods of self-learning	Individual work with a text *searching for and acquiring new information using textbooks and other written sources (including their digital versions); searching for texts, selecting fragments for analysis/interpretation, using other texts to solve a problem related to the studied issue*

10. Forms of teaching

Code	Name	Number of hours	Assessment of the learning outcomes of the module	Learning outcomes of the module	Methods of conducting classes
01	lecture	20	exam	W01, W02, W03, W04	a01, c02, c07, f01, f02
02	practical classes	20	course work	K01, U01, U02, U03, U04, W01,	a05, e01, e08, f01

				W02, W03, W04	

11.	The student's work, apart from participation in classes, includes in particular:		
Code	**Category**	**Name (description)**	**Is it part of the BUNA?**
a03	Preparation for classes	Developing practical skills *activities involving the repetition, refinement and consolidation of practical skills, including those developed during previous classes or new skills necessary for the implementation of subsequent elements of the curriculum (as preparation for class participation)*	Yes
a04	Preparation for classes	Consulting materials complementary to those indicated in the syllabus *agreeing on materials complementary to those indicated in the syllabus, supporting the implementation of tasks resulting from or necessary for class participation*	Yes
b01	Consulting the curriculum and the organization of classes	Getting acquainted with the syllabus content *reading through the syllabus and getting acquainted with its content*	Yes
c02	Preparation for verification of learning outcomes	Studying the literature used in and the materials produced in class *exploring the studied content, inquiring, considering, assimilating, interpreting it, or organizing knowledge obtained from the literature, documentation, instructions, scenarios, etc., used in class as well as from the notes or other materials/artifacts made in class*	No
c03	Preparation for verification of learning outcomes	Implementation of an individual or group assignment necessary for course/phase/ examination completion *a set of activities aimed at performing an assigned task, to be executed out of class, as an obligatory phase/element of the verification of the learning outcomes assigned to the course*	Yes
d01	Consulting the results of the verification of learning outcomes	Analysis of the corrective feedback provided by the academic teacher on the results of the verification of learning outcomes *reading through the academic teacher’s comments, assessments and opinions on the implementation of the task aimed at checking the level of the achieved learning outcomes*	Yes

Information on the details of the module implementation in a given academic year can be found in the syllabus available in the USOS system: https://usosweb.us.edu.pl.