

1.	Field of study	Biomedical Engineering
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	full-time

7. General information about the module	
Module name	Image morphometry
Module code	08-IBIO-S1-17-7-MO
Number of the ECTS credits	4
Language of instruction	Polish
Purpose and description of the content of education	Materiał modułu "Morfometria obrazowa" wymaga poznania i zrozumienia połączeń między fizyką a analizą i przetwarzaniem obrazów. Dodatkowo wymaga nabycia praktycznych umiejętności posługiwaniem się tą wiedzą. Podstawy teoretyczne to przede wszystkim przyswojenie i zrozumienie kluczowych pojęć związanych z morfometrią obrazową, nabycie umiejętności kojarzenia metrologii z analizą obrazów oraz zastosowania tej wiedzy w praktyce. Jest to też umiejętność odpowiednio efektywnego i szybkiego odszukiwania wymaganych informacji w literaturze. Umiejętności praktyczne nabywa się zatem poprzez analizę przykładowych algorytmów oraz samodzielne rozwiązywanie zadań. Moduł zatem stanowi swoiste połączenie między wiedzą teoretyczną, ogólnymi przykładami a umiejętnością profilowania wybranych metod (zagadnień) morfometrii obrazowej i wiedzy z tego zakresu w praktycznym wykorzystaniu.
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)
K_1	Klasyfikuje wiedzę z zakresu fizyki, analizy i rozpoznawania obrazów medycznych.	W11	4
K_2	Wyjaśnia metody, techniki, narzędzia i materiały stosowane w pomiarach fizycznych.	W03	3
K_3	Klasyfikuje informacje z literatury oraz innych źródeł dotyczących morfometrii obrazowej.	W09	2
K_4	Zna i potrafi zastosować techniki grafiki komputerowej oraz metody przetwarzania obrazu, a także z zakresu trójwymiarowej obróbki obrazu i animacji.	U24 W10	2 2
K_5	Potrafi przy wykonywaniu analizy problemu technicznego zastosować wiedzę posiadaną lub zaczerpniętą z różnych źródeł, nie tylko w zakresie inżynierii biomedycznej, ale także nauk pokrewnych.	W14	1
K_6	Klasyfikuje istniejące rozwiązania informatyczne: aplikacje, algorytmy, metody numeryczne itp.	W01 W11	1 1
K_7	Wykonuje prace indywidualne i zespołowe.	U02	4

K_8	Demonstruje odpowiedzialność za wspólnie realizowane zadania w ramach zespołu.	K03	1
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9. Methods of conducting classes		
Code	Category	Name (description)
a05	Lecture methods / expository methods	Explanation/clarification <i>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</i>
c06	Demonstration methods	Demonstration-imitation <i>a presentation of a model way of performing specific activities accompanied by a commentary; it aims at triggering imitation activities in an individual or in a group of participants observing the activities of the person teaching the course until the right habit is formed through regular exercise; the demonstration-imitation method is combined with a physical practice of activities/behaviours</i>
d01	Programmed learning methods	Working with a computer <i>e.g., Webquest; implementation of educational tasks using electronic and digital devices, computer programs and Internet applications; the academic teacher acts as a consultant; students' work is carried out step by step according to the plan laid own by the person teaching the course and following his instructions, and proceeds towards producing the indicated results within the set deadline</i>

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
k_fs_1	laboratory classes	30	course work	K_1, K_2, K_3, K_4, K_5, K_6, K_7, K_8	a05, c06, d01

11. The student's work, apart from participation in classes, includes in particular:			
Code	Category	Name (description)	Is it part of the BUNA?
a01	Preparation for classes	Search for materials and review activities necessary for class participation <i>reviewing literature, documentation, tools and materials as well as the specifics of the syllabus and the range of activities indicated in it as required for full participation in classes</i>	No
a02	Preparation for classes	Literature reading / analysis of source materials <i>reading the literature indicated in the syllabus; reviewing, organizing, analyzing and selecting source materials to be used in class</i>	No
a03	Preparation for classes	Developing practical skills <i>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)</i>	No
a05	Preparation for classes	Production/preparation of tools, materials or documentation necessary for class participation <i>developing, preparing and assessing the usefulness of tools and materials (e.g. aids, scenarios, research tools, equipment, etc.) to be employed in class or as an aid when preparing for classes</i>	No
b01	Consulting the curriculum and the organization of classes	Getting acquainted with the syllabus content <i>reading through the syllabus and getting acquainted with its content</i>	Yes
c02	Preparation for verification of learning outcomes	Studying the literature used in and the materials produced in class <i>exploring the studied content, inquiring, considering, assimilating, interpreting it, or organizing</i>	No

		<i>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</i>	
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 <i>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</i>	Yes
d02	Consulting the results of the verification of learning outcomes	Development of a corrective action plan as well as supplementary/corrective tasks <i>reviewing and selecting tasks and activities enabling the elimination of errors indicated by the academic teacher, their verification or correction resulting in completing the task with at least the minimum passing grade</i>	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>.