GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Multimedia in Human-Computer Interaction, PG_00047655						
Field of study	Informatics						
Date of commencement of studies	October 2026		Academic year of realisation of subject	2027/2028			
Education level	first-cycle studies		Subject group	Obligatory subject group in the field of study Subject group related to scientific research in the field of study			
Mode of study	Full-time studies		Mode of delivery	at the university			
Year of study	2		Language of instruction	Polish			
Semester of study	3		ECTS credits	3.0			
Learning profile	general academic profile		Assessment form	assessment			
Conducting unit	Department of Intelligent Interactive Systems -> Faculty of Electronics Telecommunications and Informatics -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Mariusz Szwoch				
	Teachers		dr inż. Mariusz Szwoch				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours	Self-study		SUM
	Number of study hours	30		10.0	35.0		75
Subject objectives	To familiarize students with the problems of multimedia systems, image processing and recognition, information visualization, perception and acquisition of multimedia data, creating of multimedia applications including video games, and data compression.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W44] knows and understands, to an advanced extent, architecture, design principles and methods of hardware and software support for local and distributed information systems, including computing systems, databases, computer networks and information applications, as well as the principles of human-computer interaction, the operation and evaluation criteria of data processing, storage and transfer methods, including computational algorithms, artificial intelligence and data mining as well as standards and methods of IT systems administration, monitoring of processes and robustness to undesirable phenomena and activities	Differentiates and implements methods and algorithms of image processing. Creates software with graphical user interface for image processing and multimidia performance. Creates software with animation and simple video games using game engines. Creates and process raster graphics	[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation
[K6_K03] is ready to meet social obligations, co-organise activities for the social environment, initiate actions for the public interest, think and act in an entrepreneurial way	Be able to interact in a group, design, prepare and implement an IT product together with others.	[SK2] Assessment of progress of work
[K6_W04] knows and understands, to an advanced extent, the principles, methods and techniques of programming and the principles of computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study, and organisation of systems using computers or such devices	Differentiates and implements methods and algorithms of image processing. Student describes methods of human perception and aquisition of multimedia data. Explains differences between different formats and methods of compression of multimedia data. Differentiates methods and algorithms of image processing and pattern recognition. Differentiates, examines and evaluates a quality of user interfaces. Describes creation methods of 3D vector animation	[SW1] Assessment of factual knowledge
[K6_U04] can apply knowledge of programming methods and techniques as well as select and apply appropriate programming methods and tools in computer software development or programming devices or controllers using microprocessors or programmable elements or systems specific to the field of study	Differentiates and implements methods and algorithms of image processing. Creates software with graphical user interface for image processing and multimidia performance. Creates software with animation and simple video games using game engines. Creates and process raster graphics.	[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools

Subject contents

Course content – lecture
1. Introduction 2. Multimedia - definitions and applications 3. Information media 4. Human perception 5. Multimedia data acquisition 6. Multimedia storing formats 7. Compression of multimedia data: images, sound and video 8. Image processing 9. Image recognition: OCR, OMR and other applications 10. Programming of multimedia applications. 11. Creation of graphical interfaces. Visual programming 12. Game Engines 13. Video games development 14. Role of the interface, examples of a good and a bad interface 15. Classification of users 16. Human factors, cultural differences 17. Evaluation of the interface 18. Task analysis 19. Interface layers: mental models 20. Metaphors 21. Methods/interaction styles 22. User help 23. Interface description methods, GOMS 24. GOMS - examples 25. Final exam

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Midterm colloquium	51.0%	50.0%
Practical exercise	51.0%	50.0%

Recommended reading	Basic literature	1. W.Malina, S.Ablameyko, W.Pawlak: Podstawy cyfrowego przetwarzania obrazów, Warszawa 2002. 2. R.Tadeusiewicz, P.Korohoda: Komputerowa analiza i przetwarzanie obrazów, Kraków 1997. 3. K.Skarbek (red.): Multimedia Algorytmy i standardy kompresji, Akademicka OFic. Wyd., Warszawa 1998 4. W.L.Rosch: Biblia o multimediach, Intersoftland, Warszawa 1997 5. E. Adams: Projektowanie gier. Podstawy, Helion, 2011. 6. B. Miguel, T. de Sousa: Programowanie gier. Kompendium, Helion, Gliwice 2003. 7. A.Thorn: Unity 2018 By Example - Second Edition, Packt Publishing 2018 8. N.A.Borromeo , J.G.G.Salas: Hands-On Unity Game Development - Fourth Edition, Packt Publishing, 2024 9. M.Smith, S.Ferns, S.Murphy, Unity Cookbook - Fifth Edition, Packt Publishing, 2023
	Supplementary literature	1. D.Baron: Hands-On Game Development Patterns with Unity 2019, Packt Publishing 2019 2. H. Ferrone: Learning C# by Developing Games with Unity 2019 - Fourth Edition, Packt Publishing 2019
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Practical activites within the subject	Not applicable	

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