

Bialystok University of Technology									
Field of study	Computer Science							Degree level and programme type	Engineer's degree full-time programme
Specialization/ diploma path	---							Study profile	academic
Course name	Data Visualization and Communication							Course code	FCS-00092
								Course type	obligatory
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	3
	30				30			No. of ECTS credits	6
Entry requirements	Linear Algebra (FCS-00030), Calculus (FCS-00002), Discrete Mathematics (FCS-00054), Mathematical Statistics (FCS-00065),								
Course objectives	To familiarise student with basic techniques of data visualisation.								
Course content	<p>Lecture:</p> <ol style="list-style-type: none"> 1. Basic concepts of data visualisation 2. Design and colours 3. CSV format for data exchange 4. Basic tools and techniques to create charts 5. Multidimensional Data 6. Trees, and Hierarchies 7. Networks and geographic data 8. Heat map representation 9. More advanced techniques and modern data representations <p>Classes</p> <ol style="list-style-type: none"> 1. Implement CSV parser and storage 2. Present data as table, allow user to edit values and export data. 3. Implement line chart 4. Implement pie chart 5. Implement heat map 6. Final project 								
Teaching methods	brainstorming, programming, subject exercises, simulation,								
Assessment method	Projects								
Symbol of learning outcome	Learning outcomes							Reference to the learning outcomes for the field of study	
LO1	is familiar with the basic concepts of data visualisation and subsystem building							K_W05 K_W10 K_U10	
LO2	knows the methods of representation and processing of digital data							K_W10	
LO3	knows the technologies and methods used in the creation of applications that visualise data							K_W10 K_U06 K_U11	
LO4	is able to present the results of experiments in graphic form							K_U10	
LO5	is able to identify the technical and scientific use of computer graphics							K_U10	
Symbol of learning outcome	Methods of assessing the learning outcomes							Type of tuition during which the outcome is assessed	
LO1	Written exam							L	
LO2	Written exam							L	
LO3	Projects							Sw	
LO4	Projects							Sw	
LO5	Written exam, projects							L, Sw	
Student workload (in hours)								No. of hours	
Calculation	1 - Attendance at lectures -							30	
	2 - Attendance at laboratories -							30	
	3 - Preparation for laboratories -							10	
	4 - Homeworks -							30	
	5 - Participation in student-teacher sessions -							10	
	6 - Preparation of reports -							25	
	7 - Preparation for the exam -							15	
TOTAL:								150	
Quantitative indicators								HOURS	No. of ECTS credits
Student workload - activities that require direct teacher participation								70 (1)+(2)+(5)	2.8
Student workload - practical activities								95 (2)+(3)+(4)+(6)	3.8
Basic references	Kraak, Menno-Jan., and Ferjan. Ormeling. Cartography : Visualization of Spatial Data. Dorchester: Longman, 1996. Marakas, George M. Modern Data Warehousing Mining and Visualization : Core Concepts. Upper Saddle River: Pearson Education, 2003								
Supplementary references	Fayyad, Usama M., Georges G. Grinstein, and Andreas. Wierse. Information Visualization in Data Mining and Knowledge Discovery. San Francisco: MK/Morgan Kaufmann, 2002. Print. The Morgan Kaufmann Ser. in Data Management Systems.								
Organisational unit conducting the course	Department of Digital Media and Computer Graphics							Date of issuing the programme	
Author of the programme	dr inż. Marcin Skoczylas							Feb. 11, 2022	

L - lecture, C - classes, LC - laboratory classes, P - project, SW - specialization workshop, FW - field work, S - seminar