Formularz opisu przedmiotu (formularz sylabusa) na studiach wyższych, doktoranckich, podyplomowych i kursach dokształcających

A. Ogólny opis przedmiotu

Nazwa pola	Komentarz
Name of the subject (in Polish and English)	**Data Processing and Visualization Techniques** **Przetwarzanie danych oraz techniki wizualizacji**
Unit offering the subject	Faculty of Philosophy and Social Sciences
Unit for which the subject is offered	All faculties
Subject code	
ISCED code	
Number of ECTS credits	5
Method of assessment	graded credit
Language of instruction	English
Designation whether a subject may be credited more than once	Yes
Allocation of the subject to subject groups	University-wide courses
Total student workload	Classes requiring direct participation of the teacher: lecture and workshop 25 hours (1 ECTS) Self-study: make up the series of homework according schedule of topics 25 hours (1 ECTS) Self-study: two final project preparation 50 hours (2 ECTS) Self-study: final project presentation and defense 25 hours (1 ECTS) Total: 125 h (5 ECTS)
Learning outcomes - knowledge	The students will have an elementary knowledge about visualisation technologies and basic terminology. The students will know modern methods for the visualisation of knowledge and large data.
Learning outcomes - skills	The students will be able to design complex visual layouts by selecting appropriate variables, labels and axes. The students will be able to visualize required announcement in both functional and aesthetic way.
Learning outcomes - social competencies	The students will be able to understand visual language of presented project, read it and correctly interpret as well as share their knowledge with other users regarding to their needs.
Teaching methods	- lecture - display - e-learning platform
Prerequisites	The students be interested in data analysis and professional visualisation of data.
Brief description of the subject	The course objective is to give a practical knowledge of how to effectively visualize abstract information and present it to users in an effective way. Students will gain hands-on experience in the application of this knowledge to specific domains, including browsing and organizing information for diverse and non-technical users.
Complete description of the subject	Information visualization is the new interdisciplinary study of "the visual representation of large-scale collections of non-numerical information, such as files and lines of code in software systems, library and bibliographic databases, networks of relations on the internet, and so forth". By using visual maps it is possible to study the structure and

	dynamics of the various fields of science and discover the scholar trends and themes. While fields such as scientific visualization involve the presentation of data that has some physical or geometric correspondence, information visualization focuses on abstract data without such correspondences such as symbolic, tabular, networked, hierarchical, or textual information sources. The course will highlight the process of producing effective visualizations that take the needs of users into account and illustrate practical visualization procedures. It will cover the • history and related fields of information visualization • perceptual basis of information visualization, • major and advanced visualization techniques, • data processing tools and techniques, • discussions of information visualization systems and fundamental problems in the field. The course objective is to give a practical knowledge of how to effectively visualize abstract information and hands-on experience in the application of this knowledge to specific domains, different tasks such as browsing or organizing information for diverse and possibly non-technical users.
Literature	1. A. Cairo. The Functional Art. New Riders, 2013. 2. A. Cairo. How Charts Lie. W. W. Norton & Company, 2019. 3. K. Börner. Atlas of Science. MIT Press, 2010. 4. Ch. Chen. Information Visualization. Beyond the Horizon. Springer, 2008. 5. R. Tufte. Envisioning Information. Graphics Pr, 1990. 6. C. Ware. Information Visualization : Perception for Design. Morgan Kaufmann, 2000. 7. David McCandless. The Visual Miscellaneum. NewYork, USA: HarperCollins Publisher, 2009. 8. V. Osińska. Wizualizacja informacji. Studium informatologiczne. Toruń, UMK, 2016. 9. On-line resources: http://www.cc.gatech.edu/~stasko/7450/09/courses.html http://innovis.cpsc.ucalgary.ca/ http://coitweb.uncc.edu/~jyang13/infovis2010.html
Assessment methods & criteria	The final assessment include: • regular attendance at lecture, • make up the homework, • 2 final projects design and presentation. Evaluation scheme rely on following values: project's substantive value (50%), mastery of technology (20%), aesthetic (10%), innovation (10%) and very essential optimizing output files (10%).
Work placement	not applicable

B) Opis przedmiotu cyklu

Nazwa pola	Komentarz
Didactic cycle	2021/2022 W (winter)
Method of assessment of the subject in the cycle	As in part A
Type of classes, number of hours of classes and methods of assessment	As in part A
Subject coordinator	Veslava Osińska
Subject teachers	Brett Buttliere
Nature of the subject	University-wide courses
Limit of places available in each group	Group - 12 students
Time and place	University Library Lab 140, date will be specified later
Number of hours using distance learning methods and techniques	8
Subject website	
Learning outcomes	If identical with part A please write „As in part A"
Assessment methods & criteria	If identical with part A please write „As in part A"
List of topics	Course content covers following topics: Data Processing and visualisation 1. Basic statisctics and informative elements (e.g., standard errors): 2 hours. 2. Introduction to R nd R studio. Data preparation: types, frames: 2 hours. 3. Introduction to plyr and dplyr packages: 2 hours. 4. Creating simple and informative graphs: 1 hour. 5. Using plyr to produce beautiful graphs: 2 hours. 6. Identifying misleading graphs and information in the news. Finding these errors in your own life: 4 hours. 7. Final test: 2 hours Advanced data Presentation and Analysis 1. Introduction to information visualisation, functionality and importance in modern society (2 h) 2. Data processing and gathering. Data formats and samples (2 h) 3. Modern visualisation techniques used in big data processing and analysis (2 h) 4. Visualisation of text and appropriate toolset (2 h) 5. Social Network Analysis, graphs design and modelling (3 h) 6. Discussions of information visualization systems and fundamental problems in the field (2 h). 7. Final project defense: 2 hours
Teaching methods	If identical with part A please write „As in part A"
Literature	If identical with part A please write „As in part A"