SYLLABUS – A COURSE DESCRIPTION

I. General information

1. Course name – **Data analysis and visualization**
2. Course code – 15-DAV-EL-11
3. Course type (compulsory or optional) – **compulsory**
4. Study programme name – **English Linguistics: Theories, Interfaces, Technologies**
5. Cycle of studies (1st or 2nd cycle of studies or full master's programme – **1st cycle**
6. Educational profile (general academic profile or practical profile) – **general academic**
7. Year of studies – **2B**
8. Type of classes and number of contact hours – **30 h practical classes**
9. Number of ECTS credits – **2**
10. Name, surname, academic degree/title, email address of the course lecturer / other teaching staff* – **dr Kamil Kaźmierski, kamil.kazmierski@wa.amu.edu.pl**
11. Language of instruction – **angielski**
12. Online learning - yes (partially / fully) / no: yes (fully

*please underline course coordinator's nam

II. Detailed information

1. Course aim (aims)

The aim of the course is to further develop students' skills of statistical data analysis, with a focus on linear regression modeling, as well as effective data visualization.

2. Pre-requisites in terms of knowledge, skills and social competences (if relevant)

Familiarity with the R statistical environment.

3. Course learning outcomes (EU) in terms of knowledge, skills and social competences and their reference to study programme learning outcomes:

Course learning outcome symbol (EU)	**On successful completion of the course and validation of its learning outcomes, a student:**	**Reference to study programme learning outcomes**
15-DAV_01	Understands the multifactorial nature of variablity in langauge	K_W06
15-DAV_02	Understands advanced data transformation, visualization and modeling in the R statistical environment	K_W07
15-DAV_03	Can apply advanced data transformation, visualization and modeling in the R statistical environment	K_U05
15-DAV_04	Competently analyze the reasons of variability in linguistic phenomena using advanced statistical models	K_U07
15-DAV_05	Is ready to use the knowledge gained to cooperate with research, educational and industry institution	K_K05

4. Learning content with reference to course learning outcomes (EU)

Course learning content:	**Course learning outcome symbol(s) (EU)**
Transformation, visualization and modeling data: tools of gaining knowledge Exploration vs. Hypothesis testing	15-DAV_01, 15-DAV_02
Data visualization ! Goals of visualization, types ofg plots, introduction to ggplot2	15-DAV_03

Data transformation Introduction to dplyr, transofrmation pipes wth %>%, discretization of continuous variables	15-DAV_02, 15-DAV_03
Data explroation Summary tables, summary plots	15-DAV_02, 15-DAV_03
Data tables Tabular data (tibble), creating data, variable format in tables (tidyr)	15-DAV_02, 15-DAV_03
Data import Data import from offline files and online sources	15-DAV_02, 15-DAV_03
Processing character strings stringr, regualr expressions	15-DAV_02, 15-DAV_03
Factors Order of levels in factors: in plots and model sumamries, verification of hand-coding in the data	15-DAV_02, 15-DAV_03
Relational data Integrating information from several tables, large data tables with *data.table*	15-DAV_02, 15-DAV_03
Linear regression 1 Modeling for hypothesis testingm types of variables, selection of variables (experimental control), interpreting results	15-DAV_02, 15-DAV_03, 15-DAV_04
Linear regression 2 Case study: Plag et al., model diagnostics	15-DAV_01, 15-DAV_03, 15-DAV_04
Linear regression – mixed effects Types of effects (fixed effects vs. random effects)	15-DAV_03, 15-DAV_04
Logistic and Poisson regression Model architecture as a function of the nature of response variable, interpretation and visualization of results of logistic regression	15-DAV_03, 15-DAV_04
Logistic regression – mixed effects Applying logistic regression with mixed effects	15-DAV_03, 15-DAV_04
Reporting results Html reports with RMarkdown, publication-ready graphics	15-DAV_02, 15-DAV_05,

5. Reading list:

   - Baayen, R. H. 2008. *Analyzing linguistic data*. Cambridge: Cambridge University Press.
   - Plag, I.; Homann, J. & Kunter, G. 2017. "Homophony and morphology: The acoustics of word-final S in English", *Journal of Linguistics* 53, 181-216.
   - Wickham, H. 2016. *ggplot2: Elegant graphics for data analysis*. New York: Springer.
   - Wickham, H. & Grolemund, G. 2016. *R for data science*. Sebastopol, CA: O'Reilly.

III. Additional information

1. Teaching and learning methods and activities to enable students to achieve the intended course learning outcomes (please indicate the appropriate methods and activities with a tick and/or suggest other methods.)

Teaching and learning methods and activities	✔
Lecture with a multimedia presentation	✔
Interactive lecture	
Problem-based lecture	
Discussions	
Text-based work	
Case study work	✔
Problem-based learning	✔
Educational simulation / game	
Task-solving learning (e.g.: calculation, artistic, practical tasks)	✔
Experiential work	
Laboratory work	
Scientific inquiry method	✔
Workshop method	
Project work	✔
Demonstration and observation	
Sound and/or video demonstration	
Creative methods (e.g.: brainstorming, SWOT analysis, decision tree method, snowball technique, concept maps)	
Group work	✔
I Other – please specify	
…	

2. Assessment methods to test if learning outcomes have been achieved (please indicate with a tick the appropriate methods for each LO (EU) and/or suggest different methods)

Sposoby oceniania	Symbole EK dla modułu zajęć/przedmiotu					
Written exam						
Oral exam						
Open book exam						
Written test						
Oral test						
Multiple choice test						

Project	15-DAV_01	15-DAV_02	15-DAV_03	15-DAV_04	15-DAV_05	
Essay						
Report						
Individual presentation	15-DAV_01	15-DAV_02	15-DAV_03	15-DAV_04	15-DAV_05	
Practical exam (performance observation)						
Portfolio						
Other (please specify)						
…						

3. Student workload (ECTS credits)

Student workload (ECTS credits)		**Mean number of hours spent on each activity type**
	Contact hours with the teacher as specified in the study programme	30
Students' self-study*	Preparation for classes	10
	Reading for classes	10
	Essay / report / presentation / demonstration preparation, etc	5
	Project preparation	5
	Term paper preparation	
	Exam preparation	
	Other (please specify)	
	…	
	TOTAL HOURS	60
	Total ECTS credits for the course	2

* please indicate the appropriate activity types and/or propose different activities

4. Assessment criteria in accordance with AMU in Poznan's grading system:

Very good (bdb; 5,0): the student knows and understands the concepts of the subject very well, is able to use the tools she has learned very well

Good plus (+db; 4,5): the student knows and understands the concepts of the subject well, is able to use the tools she has learned very well, but makes small errors

Good (db; 4,0): the student knows and understands the concepts of the subject well, but makes occasional errors

Satisfactory plus (+dst; 3,5): the student knows and understands the concepts of the subject to a basic extent, is able to use the tools she has learned to a satisfactory degree, but makes mistakes

Satisfactory (dst; 3,0): the student knows and understands the concepts of the subject to a basic extent, is able to use the tools she has learned to a basic degree, but makes mistakes

Unsatisfactory (ndst; 2,0): the student does not know or understand the concepts of the subject, and isn't able to use the tools she has learned without gross errors