**Table 5.2** Specification of subjects

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| **Study program:** Advanced Data Analytics in Business | | | | |
| **Name of the subject: Research Design and Data Visualization Techniques** | | | | |
| **Teacher(s):** Slavoljub Milovanović, Ognjen Radović, Jovica Stanković | | | | |
| **Status of the subject:** Elective | | | | |
| **Number of ECTS credits: 7** | | | | |
| **Conditions:** Programming for business applications 1 | | | | |
| **Subject goal**  Mastery of certain methods of big data visualization (tables, diagrams, advanced diagrams, dashboards) in order to observe relationships and regularities. Students will be training to modelling real problems, analysing and visualization. Also, they will be taught to use Python and R programming languages for research planning, graphical presentation of data and results of researches. | | | | |
| **Outcome of the subject**  Students will be able to:   * create summary tables and diagrams in order to be able to interpret, analyze and conclude on the basis of available data; * identify wrong data, reduce sets and discover the significance of relationships and trends; * independently plan research and transfer to others analyzes done in the programming languages Python and R. | | | | |
| **Subject content**  *Theory*  **Research planning**: selection, collection and verification of data for qualitative and quantitative research methods.  **Basics of data visualization**: Defining data visualization, data visualization process, development of interactivity and composition of visual solution for data presentation.  **Application of Python language in the presentation of business data**: creation of basic chart types, creation of advanced charts, introduction to pygal, Matplotlib, Plotly library.  **Application of the R language in the presentation of business data**: development of basic chart types, development of advanced charts, introduction to the ggplot2 library.  *Practical learning*  Exercises in the computer center. Examples will be processed and implemented in accordance with the theoretical teaching. | | | | |
| **Literature**   1. Kirk, Andy, 2019, *Data Visualisation: A Handbook for Data Driven Design*, 2nd Edition, SAGE Publications Ltd. 2. Embarak, Ossama, 2018, *Data* *Analysis and Visualization Using Python*, Apress. 3. Eric Goh Ming Hui, 2019, *Learn R for Applied Statistics*, Apress. | | | | |
| **Number of active teaching classes** | **Theoretical teaching:** 30 | | **Practical teaching:** 45 | |
| **Method of carrying out the teaching**  Interactive lectures and exercises in the computer classroom. | | | | |
| **Evaluation of knowledge (maximum number of points 100)** | | | | |
| **Pre-exam obligations** | points | **Final exam** | | points |
| Activity during lectures | 10 | Written exam | | 50 |
| Practical teaching | 10 | Oral exam | | 0 |
| colloquium | 20 | Project presentation | | 0 |
| Seminar(s) | 10 | **Total** | | **100** |