

Course title	<i>Data processing and presentation [AMSP Computer science]</i>
Course code	DatZ5012
Scientific discipline	Computer science #
Credit points	2
ECTS credit points	3
Total contact hours	32
Number of hours for lectures	16
Number of hours for seminars and practical assignments	16

Course developer (-s)

Dr. phys, docent Svetlana Ignatjeva

Course abstract

The course is designed for the students of the Master's study programme "Computer science" (45481). The aim of the course is to provide understanding and promote acquisition of basic knowledge on the environment of the statistical data processing package SPSS, as well as to make data tables and diagrams using SPSS tools, to obtain indicators of descriptive statistics, to modify the data, to analyse the implementation of business idea. Study course objectives: to develop the skills of scientific data procession, to develop the skills for the independent use of modern computer programmes of data processing, to develop the skills to use modern data processing methods.

Outcomes

After this course successful mastering, students gain understanding of the opportunities of information technologies and practical skills in the use of information technologies to store, select and analyse scientific research data, to create process models and present the obtained results. Students are able to find and obtain the data necessary for the analysis, store them in the databases, use different techniques and methods of computer assisted data analysis, reflect the results of the analysis and present them to readers and audience in an appropriate and effective way.

Course plan

Course structure: lectures – 16 h, seminars – 16 h

Lecture themes:

1. Development tendencies and perspectives of data resource management technologies.
2. Improvement of information storage methods.
3. Data processing with the help of "Data Mining".
4. Types of information collection methods: statistical methods, neural networks, genetic algorithms, evolutionary algorithms.
5. Logic correlation research methods, knowledge systems, application of imprecise logic, method of cluster analysis.
6. Means of data processing and analysis: SPSS, Statistica.
7. Running R from SPSS.
8. Clementine.

Themes of seminars/practical work/laboratory work:

1. Packages used for data analysis.
2. Descriptive statistics.

3. Analysis of differences.
4. Linear regression and correlation.
5. Methods of nonparametric statistics.
6. Analysis of classifications.
7. Factor analysis.
8. Dynamic rows, their adjustment. Prognosis.

Students` independent work:

- SPSS opportunities for graphical representation of data
- Spectral analysis •R language opportunities

Requirements for awarding credit points

Defence of a report and three independent study works.

Compulsory reading

1.Arhipova I., Bāliņa S. Statistika ekonomika : risinājumi ar SPSS un Microsoft Excel. Rīga : Datorzinību centrs, 2003, 349 lpp. 2.Sukovs, L. Aleksejeva, K. Makejeva, Borisovs A. „Datu ieguve. Pamati.” Rīgas Tehniskās universitātes Datorzinātnes un informācijas tehnoloģijas fakultātes Informācijas tehnoloģijas institūts SIA „Drukātava”, 2006. 130 lpp.

Further reading

- 1.Data Mining and Knowledge Discovery, ISSN: 1573-756X (electronic version), <http://www.springerlink.com/content/1384-5810>
- 2.Lasmanis A. Datu ieguves, apstrādes un analīzes metodes pedagogijas un psiholoģijas pētījumos. 1.grāmata. – Rīga SIA”Izglītības solī”, 2002.
- 3.Lasmanis A. Datu ieguves, apstrādes un analīzes metodes pedagogijas un psiholoģijas pētījumos. SPSS , 2.grāmata. – Rīga SIA”Izglītības solī”, 2002.
- 4.Jansons V., Kozlovskis K. Ekonomiskā prognozēšana SPSS 20 vidē, RTU, 2013
- 5.Larman. Applying UML and patterns: an introduction to object-oriented analysis and design and the Unified Process.- Prentice Hall PTR, third ed., 2005.
- 6.Rumbaugh, G. Booch, I. Jacobson. The Unified Modeling language User Guide - Addison-Wesley, 2004.
- 7.StatSoft Homepage <http://www.statsoftinc.com/textbook/stathome.html>
- 8.Бююль А., Цёфель П. SPSS. Искусство обработки информации. Анализ статистических данных и восстановление скрытых закономерностей. ДиаСофт 2002.
- 9.Боровиков В.П., Боровиков И.П. Statistica. Статистический анализ и обработка данных в среде Windows. - М., 1997, с 608.
- 10.Дюк В., Самойленко А. Data Mining: учебный курс. – С.- Пб, Питер, 2001.

Periodicals and other sources

1. Journal of econometrics. ISSN: 0304-4076, www.elsevier.com/wps/find/journaleditorialboard.cws_home/505575/editorialboard?navopenmenu=-2
2. International Journal of Business Intelligence and Data Mining (IJBIDM). ISSN (Online): 1743-8195 , <https://www.inderscience.com/browse/index.php?journalID=143>
- 3.The Journal of Business and Economic Statistics, <http://www.amstat.org/publications/jbes/index.cfm?fuseaction=main>