MAJOR FIELD OF STUDY "INFORMATICS", MASTER OF SCIENCE, PERIOD OF STUDY 1 YEAR

QUALIFICATION CHARACTERIZATION

OF MAJOR FIELD OF STUDY "INFORMATICS"
FOR "MASTER OF SCIENCE" DEGREE
WITH PROFESSIONAL QUALIFICATION "MASTER OF SCIENCE IN INFORMATICS", PERIOD OF STUDY 1 /ONE/ YEAR

I. Requirements to professional qualities and competences of enrolled students

Students enrolled in this major field of study have to submit diplomas for completed higher education acquired educational and qualification degree "Bachelor"/"Master" in specialties in another professional direction from areas of higher education 4. Natural sciences, mathematics and informatics, 5. Technical sciences and 3. Social, economic and legal sciences, regular form of education, duration of education – 2 semesters (1 year).

II. Requirements to professional qualities and competences of students, completed this major field of study

Neofit Rilski South-Western University prepares qualified experts in Informatics that can apply their knowledge and skills in the area of science, culture, education and economics in Bulgaria and abroad.

After completion of "Master in Informatics" degree they can successfully realize themselves as: programmers, system and network administrators and designers, graphic designers, scientists, experts in database design, experts in software technologies, etc.

At completion of Master of Science in Informatics degree, students obtain:

- ✓ profound knowledge in the area of Informatics;
- ✓ good preparation in the area of Informatics and Mathematics as well as solid practical skills conforming to modern European standards and requirements;
- ✓ formation of affinity and ability for independent research and design;
- ✓ basis for continuing education at PhD degree;
- ✓ good opportunities for realizing as experts in Bulgaria or abroad;
- ✓ thinking style and affinity to the quickly changing requirements of the information society.

III. Requirements to preparation of students completing this major field of study

Students completed MSc degree in Informatics have to possess following knowledge, skills and competences:

- ✓ to conduct independent research, to model real processes and make computer automation systems for information maintenance;
- ✓ to use mathematical models and software packages for solving real economic, engineering and management problems in continuous and discrete macrosystems;
- ✓ to take part in development of program products and packages;
- ✓ to adapt and introduce program products and systems;
- ✓ to solve various optimization problems.

IV. Professional development

The Masters graduates in this specialty can successfully work as: programmers, system and network administrators and designers, graphic designers, researchers, specialists in hardware and software technologies.

Qualification characterization of Major field of study "Informatics" for MSc degree is a basic document that determines rules for developing the curriculum. This qualification characterization is conformed with legislation in the area of higher education in Republic of Bulgaria.

S T R U C T U R E O F T H E C U R R I C U L U M
Field of Study: Informatics

First Year			
First Semester	ECTS credits	Second Semester	ECTS credits
Compulsory Courses		**Compulsory Courses**	
Neural Networks	6.0	Deep learning	6.0
Component-Oriented Software Engineering	6.0	Information Systems with Client-Server	4.5
Applied statistics		Architecture	
Optional 1 (Group I)	6.0	Optional 3 (Group II)	4.5
Optional 2 (Group I)	6.0	Written State Exam or Graduate Thesis	15.0
Optional courses (Group I)	6.0	Defense	
(Choose 2 courses)		**Optional courses (Group II)**	
Training at IT Company (Institution)		(Choose 1 course)	
Web programming with Java		Server Administration	
Knowledge bases		Theory of Algorithms	
Theory, Algorithms and Technologies for Speech Recognition		Data mining and big data	
	Total 30		Total 30

Degree: Master of Science, Period of Study: 1 year (2 semesters)

Language of Instruction: English.

TOTAL FOR 1 ACADEMIC YEAR: 60 CREDITS

NEURAL NETWORKS

Semester: I semester
Type of Course: lectures and exercises in computer lab
Hours per week: 2 hours lecture and 2 hours exsersices in computer lab / FS
Credits Numbers: 6 credits
Department: Informatics
Lecturer: Assoc. Prof. Radoslav Mavrevski, PhD
Course Status: Compulsory course.
Course description:

The course will present the main types of networks such as ordinary perceptron, Hopfield networks, Coheren networks. The basic methods of neural network training will be explained in detail. Examples will illustrate the application of neural networks in various fields such as economics, medicine and others. The course will use modern software packages for the design of neural networks such as Matlab.

Objectives:

The student should obtain knowledge of:

- Basic concepts in neural network theory.
- to design and train a neural network.

Methods of teaching: lectures, tutorials, discussions.

Pre- requirements: Programming, Database systems

Assessment and Evaluation

- Current control - 60% of the assessment
- Written exam - 40% of the grade

The course is **successful completed** with at least 51% of all scores.

Registration for the Course: Compulsory course

Registration for the Exam: coordinated with the lecturer and the Student Service Office

References

1) Basic

1. Anthony L. Caterini, Dong Eui Chang. (2018) Deep Neural Networks in a Mathematical Framework, Springer, Switzerland.
2. V. Alluru B. Rao., C++ Neural Networks and Fuzzy Logic, London IDG Books Worldwide, Inc. 1998.

2) Additional

3. Patricia Melin, Modular Neural Networks and Type 2 Fuzzy Systems for Pattern Recognition, 2012, Springer.
4. R.B. Macy. Pattern recognition with Neural networks in C++, CRC Press, 1994.

Abbreviation:
FS: Fall Semester

COMPONENT-ORIENTED SOFTWARE ENGINEERING

Semester: I semester
Course Type: lectures, lab exercises
Hours per week/FS: 2 lecture hour per week and 2 labs hours per week/FS
ECTS credits: 6.0 credits
Department: Informatics
Lecturer: Assoc. Prof. Velin Kralev, PhD, e-mail: velin_kralev@swu.bg
Course Status: Compulsory Course in Master of Science Curriculum of Informatics
Course Description:
The basic principles for creating and using components in the development of software solutions are presented in the course. The topics to be discussed are as follows: programming fundamentals. Understanding the component library; introduction to component creation2. Introduction to component creation; object-oriented programming for component writers; creating properties; creating events; creating methods; using graphics in components; handling messages; making components available at design time; modifying an existing component; creating a graphic component; customizing a grid; making a control data aware; making a dialog box a component; extending the IDE;

Course Objectives:
The aim of the course is to teach students some of the basics in creating component-oriented software solutions, using visual design environments and event-oriented programming.

After completion of the course students should be able to:

- create and use different types of components in the development of software products

Teaching Methods: Lectures, demonstrations, work on project.

Requirements/Prerequisites: Needed basic knowledge of object-oriented programming. Desirable knowledge of visual design environments and event-oriented programming, such as RAD Studio or/and Visual Studio.

Assessment: Evaluating the student shall be carried out in the sixth grad scale. Current control is performed during the laboratory sessions during the semester through two courseworks, one control test and one course project (50% of final grade). Course ends with a written exam on the material according to the attached syllabus (50% of final grade). When shown a weak exam score, the student appears on the makeup exam and retain the information received from the course work assessment.

Registration for the Course: The course is compulsory and is not applied for its study.

Registration for the Exam: Coordinated with the lecturer and Student Service Department

References:
1. Embarcadero Technologies. (2021). Component Writer's Guide: Embarcadero Technologies. Retrieved from Embarcadero Technologies Web Site: docwiki.embarcadero .com/ RADStudio/Seattle/en/Component_Writers_Guide_Index.

2. John Barrow, Linda Miller, Katherine Malan, Helene Gelderblom. (2005). Introducing Delphi Programming: Theory through Practice 4th Edition. Publisher: Oxford University Press.
3. Danny Thorpe. (1996). Delphi Component Design Paperback. Publisher: Addison-Wesley.
4. Marco Cantu. (2003). Mastering Delphi 7. Publisher Sybex.
5. Marco Cantu. (2010). Delphi 2010 Handbook: A Guide to the New Features of Delphi.
6. Nick Hodges. (2015). More Coding in Delphi. Publisher: Nepeta Enterprises.

Abbreviation:
FS: Fall Semester

APPLIED STATISTICS

Semester: I semester

Type of Course: lectures, tutorials in computer lab

Hours per week: 2 hours lectures, 1 hours tutorials in computer lab/FS

Credits Numbers: 6 credits

Department: Informatics

Lecturers: Assoc. Prof. E. Karashtranova, PhD

Course Status: Obligatory course in curriculum of major Informatics. Master degree.

Course description:

The course is introduction in nonparametric statistic and possibilities to apply IT in this area.

Objectives:

The students should obtain knowledge of:

- To apply the methods of nonparametric statistics in practice;
- To realize concrete applications with tools of IT.

Methods of teaching: seminars, tutorials, discussions, project based method.

Pre- requirements: Probability and Statistics, Information Technology

Assessment and Evaluation

Project- 70%
Final Test- 30%

The course is successful completed with at least 50% of all scores.

Registration for the Course: obligatory

Registration for the Exam: coordinated with the lecturer and the Student Service Office

TRAINING AT IT COMPANY (INSTITUTION)

Semester: I semester

Hours per week: 1 seminar hour and 3 laboratory hours/FS

ECTS Credits: 6 credits

Department: Informatics

Instructor: Part-time Assist. Prof. Ivan Zhdrapanski

Course Status: An elective course in the curriculum of major Informatics, Master degree.

Course description:

The course is designed for acquiring practical skills and habits and the acquisition of expertise through introduction and participation in the activities of companies and organizations, that design, implement, deploy and use modern IT.

Objectives:

This course aims to bind the knowledge gained from university education with hands-on activities performed in different IT companies (organizations).

Methods of teaching: Work in a real work environment.

Pre-requirements: Basic knowledge of Informational Technologies, Operating Systems, Databases and Programming.

Assessment: report; journal of the conducted practical training;

Registration for the Course: not required (core course)

Registration for the Exam: coordinated with the lecturer and the Student Service Office

WEB PROGRAMMING WITH JAVA

Semester: I

Course Type: lectures and exercise

Classes (weekly): 1 lecture and 2 exercises / FS

ECTS Credits: 6.0

Department: Informatics

Lecturer: Assoc. Prof. Nadezhda Borisova, PhD

Course Status: Elective course

Course Description: The course "Web Programming with Java" is intended for students interested in Java programming and the development of web-oriented applications. Its goal is to familiarize students with the following technologies:

- Socket programming: Developing Java applications that communicate over the Internet/Intranet using TCP/IP protocols, such as Chat clients/servers, web servers, mail clients/servers, and more.
- Java applets: Creating small Java applications that can be embedded in web pages and executed by the client's web browser.
- Web applications: Developing web applications using technologies like Servlets and Java Server Pages (JSP), creating and deploying web applications according to Sun's J2EE standards, and working with the Tomcat server.

Teaching Methods: lecture, exercises, discussion.

Requirements/Prerequisites: For the material to be understood, it is necessary for students to have basic knowledge of internet organization, programming, Java, and HTML. Due to its extensive content, the topic will be divided into several modules.

Exam: Current assessment and written exam.

- Current assessment - 60% of the assessment
- Written exam - 40% of the grade

Registration for the course: Necessary

Registration for the exam: Coordinated with lecturer and Students Service Department

References:

A. Primary:

1. Светлин Наков, Борис Червенков, Интернет програмиране с Java, http://www.nakov.com
2. The Java EE 5 Tutorial - http://java.sun.com/javaee/5/docs/tutorial/doc/JavaEETutorial.pdf
3. Java API документация - http://java.sun.com/javase/6/docs/api/
4. Eclipse - www.eclipse.org
5. Apache Tomcat - http://tomcat.apache.org/

B. Additional:

1. Step-by-step tutorial (http://www.java-tips.org/java-tutorials/tutorials/introduction-to-java-servlet).

Abbreviation: FS - Fall Semester

KNOWLEDGE BASES

Semester: I semester

Type of Course: lectures

Hours per week: 2 hours lectures /autumn semester

Credits Numbers: 6.0 credits

Department: Informatics

Lecturer: Assoc. Prof. Irena Atanasova, PhD

Course Status: Elective course in curriculum of major Informatics, Magister degree.

Course description: The course is introduction in main aspects of knowledge bases and application.

Objectives: The student should obtain knowledge of:

- Knowledge bases approach.
- Application of knowledge bases.

Methods of teaching: lectures, discussions, project based method.

Pre- requirements: Functional and Logical programming, Artificial Intelligence, and Mathematical Logics (core courses)

Assessment and Evaluation Project- 50%, Final exam- 50%

Registration for the Course: by request at the end of the current semester

Registration for the Exam: coordinated with the lecturer and the Student Service Office

References:

1. Нишева, М., Д. Шишков, Изкуствен интелект, Изд. „Интеграл, Добрич, 1995
2. Ирена Атанасова, Създаване на експертни системи (Expert Systems Development), Издателство на ЮЗУ „Н. Рилски“, онлайн издание, 2018
3. Knowledge-Based Systems. Rajendra Akerkar , Priti Sajja, 2009 , ISBN10: 0763776475.
4. Engineering of Knowledge-Based Systems. Avelino J. Gonzalez, Douglas D. Dankel, Prentice Hall (2000), ISBN-10: 0130189731.
5. Expert Systems: Principles and Programming, Fourth Edition.Joseph C. Giarratano, Gary D. Riley, 2004, ISBN-10: 0534384471

THEORY, ALGORITHMS AND TECHNOLOGIES FOR SPEECH RECOGNITION

Semester: I semester

Course Type: Optional Course

Hours per week/FS: 2 lecture hours per week and 2 lab hours per week / Fall semester

ECTS credits: 6.0 credits

Department: Informatics

Lecturers: Assoc. Prof. Radoslava Kraleva, PhD

Department: Informatics

Course Status: Optional Course in Master of Science Curriculum of Informatics

Course Description: In this course, the theoretical foundations of modern speech processing technologies will be discussed. Some speech recognition software and using them to Bulgarian speech recognition will be viewed.

Course Objectives: This course aims to provide the students with the knowledge and practical experiences for the modern technology of natural speech processing.

After the course completed, the students should know and understand:

- The methods of speech signal processing and retrieve their features.
- The methodology of the construction of a phonetic and language model in a given language.

Teaching Methods: Browsing the Web, work on coursework and essay.

Requirements/Prerequisites: The knowledge by the courses "Programming and Data Structures", "Object-Oriented Programming", "Database", "Discrete Mathematics", "Linguistics", "Pattern Recognition" and "Neural Networks", are necessary.

Assessment: Evaluating the student will be carried out by the six-point marking scale. The final assessment is in the form of a test that covers the whole teaching material including theoretical questions and practical cases. The final mark presents 50% of the final test and 50% of the mark of the course work.

Registration for the Course: Applied to the academic department at the end of current semester.

Registration for the Exam: Coordinated with the lecturer and Student Service Department

References:

1. Xuedong Huang, Alex Acero, Hsiao-Wuen Hon, Spoken Language processing – A Guide to Theory, Algorithm, and System Development, Prentice Hall PTR, 2001
2. Xuedong Huang, Alex Acero, Hsiao-Wuen Hon (2001) Spoken Language processing – A Guide to Theory, Algorithm, and System Development, Prentice Hall PTR
3. Stephen E. Leinson (2005) Mathematical Models for Speech Technology, John Wiley & Sons

4. Wu Chou, Bing Hwang Juang (2003) Pattern Recognition in Speech and Language Processing, CRC Press
5. Joseph Keshet, Samy Bengio (2009) Automatic Speech and Speaker Recognition – Large Margin and Kernel Method, John Wiley & Sons
6. Lawrence Rabiner, Ronald Schafer (2010) Theory and Application of Digital Speech Processing, Prentice Hall
7. Daniel Jarefsky, James Martin (2008) Speech and Language Processing (2nd Edition), Prentice Hall
8. Dong Yu, Li Deng (2014) Automatic Speech Recognition: A Deep Learning Approach, Springer
9. James R. Lewis (2011) Practical Speech User Interface Design, CRC Press
10. Homayoon Beigi (2011) Fundamentals of Speaker Recognition, Springer
11. Willi-Hans Steeb (2005) Mathematical Tools in Signal Processing with C++ and Java Simulations, University of Johannesburg, South Africa
12. K. R. Rao, D. N. Kim, J. J. Hwang (2010) Fast Fourier Transform: Algorithms and Apllications, Springer
13. Р. Кралева (2019) Разпознаване на реч: Корпус от говорима детска реч на български език, ISBN: 978-954-00-0199-9, УП „Неофит Рилски“, Благоевград.
14. Data Exchange System, http://childes.psy.cmu.edu/
15. Praat: doing phonetics by computer, http://www.fon.hum.uva.nl/praat/
16. WaveSurfer, http://www.speech.kth.se/wavesurfer/
17. The International Phonetic Association, http://www.langsci.ucl.ac.uk/ipa/index.html

DEEP LEARNING

Semester: II semester

Course Type: lectures and exercise

Classes (weekly): 2 lectures and 2 exercises / SS

ECTS Credits: 6.0

Department: Informatics

Lecturer: Assoc. Prof. Irena Atanasova, PhD

Course Status: compulsory course

Short Description:

The discipline "Machine Learning" (ML) aims to give students fundamental knowledge in the field of theory and application of different types of machine learning in artificial intelligence systems. The discipline provides students with the necessary practical knowledge in order to create, validate, and test image recognition systems.

Teaching Methods: lecture, exercises, discussion.

Requirements/Prerequisites: Knowledge in Mathematics.

Exam:

- Current control - 60% of the assessment
- Written exam - 40% of the grade

Registration for the course: it is not necessary

Registration for the exam: Coordinated with lecturer and Students Service Department

References:

А.Основна:

1. Alpaydin, E. (2020). Introduction to machine learning. MIT press.
2. Marsland, S. (2015). Machine learning: an algorithmic perspective. CRC press.
3. Bishop, C. M. (2006). Pattern recognition and machine learning. Springer.

Б. Допълнителна:

1. Shukla, N. (2018). Machine learning with TensorFlow. Manning Publications Co..
2. Gulli, A., & Pal, S. (2017). Deep learning with Keras. Packt Publishing Ltd.
3. McClure, N. (2017). TensorFlow machine learning cookbook. Packt Publishing Ltd.

Abbreviation:
SS: Spring Semester

INFORMATION SYSTEMS WITH CLIENT-SERVER ARCHITECTURE

Semester: II semester
Course Type: lectures, lab exercises
Hours per week: 2 lecture hours per week and 1 labs hour per week/SS
ECTS credits: 4.5 credits
Department: Informatics
Lecturer: Assoc. Prof. Velin Kralev, PhD, e-mail: velin_kralev@swu.bg
Course Status: Compulsory Course in Master of Science Curriculum of Informatics
Course Description:
The course teaches methods for developing client-server and multi-layer databases applications through object-oriented integrated development environments (IDEs) for visual design and event-oriented programming. Various aspects of design databases applications using various objects: a datasets, tfield objects and data bound controls. Developed different applications to access data depending on their architecture: client-server and multi-layer (client-application server-server). Students learn different technologies for data access by: ADO, dbExpress, IBExpress, DataSnap, Cloud applications and others.

Course Objectives:
The course objective is to give students an idea of some of the main technologies used for developing client-server and multi-layer applications for databases and their methods of use.

After completion of the course students should be able to:

- use different technologies when developing client-server and multi-layer applications for databases with different architecture.

Teaching Methods: Lectures, demonstrations, work on project.

Requirements/Prerequisites: Needed basic knowledge of databases and object-oriented programming. Desirable knowledge of programming languages C + +, Object Pascal (Delphi) and C #.

Assessment: Evaluating the student shall be carried out in the sixth grad scale. Current control is performed during the laboratory sessions during the semester through two courseworks, one control test and one course project (50% of final grade). Course ends with a written exam on the material according to the attached syllabus (50% of final grade). When shown a weak exam score, the student appears on the makeup exam and retain the information received from the course work assessment.

Registration for the Course: Submitted an application to the academic department at the end of current semester.

Registration for the Exam: Coordinated with the lecturer and Student Service Department

References:
1. Embarcadero Technologies. Developing Database Applications: Embarcadero Technologies. Retrieved from Embarcadero Technologies Web Site. 2021.

2. Marco Cantu. Mastering Delphi 7. Publisher Sybex. 2003.
3. Marco Cantu. Delphi 2010 Handbook: A Guide to the New Features of Delphi 2010. 2010.
4. Mario Szpuszta, Ingo Rammer. Advanced .NET Remoting. Publisher: Apress; 2nd ed. 2005.
5. Bob Swart. Delphi XE DataSnap Development Essentials. Bob Swart Training & Consultancy. 2011.
6. Cary Jensen Ph,D. Delphi in Depth: ClientDataSets, Publisher CreateSpace Independent Publishing Platform. 2011.
7. Andrew Troelsen. Pro C# 5.0 and the .Net 4.5 Framework, Apress. 2012.
8. Tim Patrick. Microsoft ADO.NET 4 Step by Step. Publisher: Microsoft Press. 2010.
9. Xavier Pacheco. Delphi for .NET Developer's Guide. Publisher: Sams Publishing. 2004.

Abbreviation:
SS: Spring Semester

SERVER ADMINISTRATION

Semester: II semester
Course Type: lectures and labs
Classes/FS/SS: 2 lectures and 1 lab per week /SS
ECTS Credits: 4.5 credits
Department& Informatics
Lecturer: Chief Assist. Prof. Ivo Damyanov, PhD
Course Status: Optional course in MSc Curriculum of Informatics
In this course are discussed the basic actions and problems related to network administration of Linux based systems. The course is aimed at providing the necessary skills needed to perform nearly all-important administration activities required to manage a Linux/Windows network configuration, the basic setup and management of the most commonly used Internet services.
Course Objectives: The course is aimed at introducing to students the common concepts in network administration by discussing the basic activities regarding the administration of a Linux/Windows network configuration.
Teaching Methods: Labs, demonstrations, work on project and teamwork.
Requirements/Prerequisites: Needed basic knowledge of operating systems, programming, computer architectures, computer networks and communications.
Assessment: written final exam
Registration for the Course: a request is made by students at the end of the previous semester
Registration for the Exam: coordinated with lecturer and Student Service Department
References:

1. Олаф Кирх, Тери Доусън, Ръководство на мрежовия администратор.
2. Мат Уелш, Матиас Далхаймер, Ръководство за LINUX.
3. Алдениз Рашидов. Инсталиране и конфигуриране на Web сървъри под Linux и Windows (2012)
4. Microsoft SQL ServerNotes for Professionals book
5. Ronald Bardford. Effective MySQL Backup and Recovery (2012)
6. Shijimol Ambi Karthikeyan (2018) Practical Microsoft Azure IaaS: Migrating and Building Scalable and Secure Cloud Solutions Paperback
7. Gabriel N. Schenker (2018) Learn Docker - Fundamentals of Docker 18.x: Everything you need to know about containerizing your applications and running them in production, PACKT Publishing
8. Greg D. Moore (2016) IT Disaster Response: Lessons Learned in the Field, APress
9. Lawrence E. Hughes. The Second Internet: Reinventing Computer Networking with IPv6 (2010)
10. Raphaël Hertzog, Roland Mas. The Debian Administrator's Handbook (2012)
11. Ron Aitchison. Pro DNS and BIND 10 (2011)
12. Ronald Bardford, Chris Schneider. Effective MySQL Replication Techniques in Depth (2013)

THEORY OF ALGORITHMS

Semester: II semester

Course Type: lectures and

Classes (weekly): 2 lectures and 1 exercises / SS

ECTS Credits: 6.0

Department: Informatics

Lecturer: Assoc. Prof. Radoslav Mavrevski, PhD

Course Status: Elective Course

Short Description:

The course introduces students to the basic elements of algorithm theory and their complexity. Special attention is given to the question of analysis of algorithms concerning their various aspects. The considered algorithms for different classes of tasks allow students to take the next step: to construct (synthesize) new algorithms for specific tasks assigned to them.

Teaching Methods: lecture, exercises, discussion.

Requirements/Prerequisites: Knowledge in Mathematics.

Exam:

- Current control - 60% of the assessment
- Written exam - 40% of the grade

Registration for the course: by application in the Educational Office in the end of the semester

Registration for the exam: Coordinated with lecturer and Students Service Department

References:

1) Basic

1. Cormen, Thomas H.; Leiserson, Charles E., Rivest, Ronald L., Stein, Clifford (2009). Introduction to Algorithms (3rd ed.). MIT Press and McGraw-Hill.
2. Umut A. Acar, Guy E. Blelloch. (2018). Algorithms - Parallel and Sequential, www.parallel-algorithms-book.com.
3. П. Наков, П. Добриков. Програмиране = ++ Алгоритми. ТорТеам Со, София, 1999

2) Additional

4. Introduction to Algorithms http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-006-introduction-to-algorithms-fall-2011/lecture-videos/ 2015 MIT
5. Design and Analysis of Computer Algorithms https://www.cs.umd.edu/~mount/451/Lects/451lects.pdf 2015.

Abbreviation:
SS: Spring Semester

DATA MINING AND BIG DATA

Semester: II semester

Course Type: lectures and exercise

Classes (weekly): 2 lectures and 1 exercises / SS

ECTS Credits: 4.5

Department: Informatics

Lecturer: Assoc. Prof. Irena Atanasova, PhD

Course Status: optional course

Short Description:

The course is comprised of several modules, including business analysis, knowledge extraction, and extracting dependencies from various sources. In the instructional sessions, students learn to define meaningful business questions, select an appropriate method for data analysis and apply it, use open-source software for business analysis, interpret the results, and publish the findings in a scientific publication.

Teaching Methods: lecture, exercises, discussion.

Requirements/Prerequisites: Knowledge in Mathematics.

Exam:

- Current control - 60% of the assessment
- Written exam - 40% of the grade

Registration for the course: by application in the Educational Office in the end of the semester

Registration for the exam: Coordinated with lecturer and Students Service Department

References:

1. Jiawei Han and Micheline Kamber,Data Mining: Concepts and Techniques, Second Edition, 2006.
2. Jiawei Han, Jian Pei and Micheline Kamber, Data Mining: Concepts and Techniques, Third Edition, 2012.
3. DANIEL T. LAROSE , DISCOVERING KNOWLEDGE IN DATA An Introduction to Data Mining, John Wiley & Sons, Inc., Hoboken, New Jersey, 2005.
4. Murthy S., Automatic Construction of Decision Trees from Data: A Multi-Disciplinary Survey. Journal of Data Mining and Knowledge Discovery, vol. 2, num. 4, 1998.
5. Stuart Russell and Peter Norvig. Artificial Intelligence: A Modern Approach. Prentice Hall, Second Edition, 2003.
6. Ruth Dilly, Data Mining - An Introduction. The Queen's University of Belfast - OHP Slide Material, Student Notes.
7. Kurt Thearling - "An Introduction to Data Mining".

Abbreviation:
SS: Spring Semester