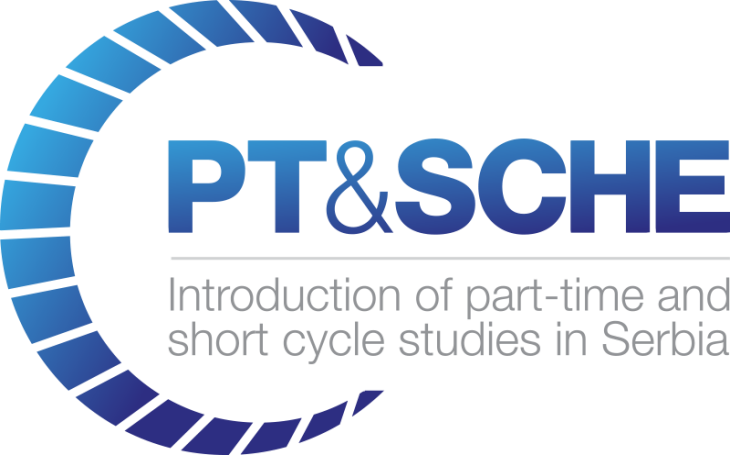
****

**CURRICULUM OF PART-TIME BACHELOR PROGRAMME INFORMATION SYSTEMS**

|  |  |
| --- | --- |
| Project Acronym: | PT&SCHE |
| Project full title: | The Introduction of part‐time and short cycle studies in Serbia |
| Project No: | 561868-EPP-1-2015-1-EE-EPPKA2-CBHE-SP |
| Funding Scheme: | ERASMUS+ |
| Coordinator: | Tallinn University, TLU |
| Project start date: | October 15, 2015 |
| Project duration: | 36 months |

|  |  |
| --- | --- |
| Abstract | Informations systems are necessary in modern business. This probrame is a multidisciplinary program containing: programming, management and business. By combining knowledge in these areas students acquire useful applied knowledge that enable him to easily find work. |

*"The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsi­ble for any use which may be made of the information contained therein."*

DOCUMENT CONTROL SHEET

|  |  |
| --- | --- |
| Title of Document: | CURRICULUM OF PART-TIME BACHELOR PROGRAMME INFORMATION SYSTEMS |
| Work Package: | WP6. Pilot implementation of F2F PT & SCHE programs |
| Last version date: | 11/07/2017 |
| Status : | Final |
| Document Version: | 1.1 |
| File Name | WP6.1.-Curriculum of part-time bachelor programme Information Systems |
| Number of Pages | 47 |
| Dissemination Level | Institutional |

VERSIONING AND CONTRIBUTION HISTORY

|  |  |  |  |
| --- | --- | --- | --- |
| Version | Date | Revision Description | Responsible Partner |
| 1.0 | 27.02.2017. | Concept development | Svetlana Štrbac-Savić, VIŠER |
| 1.0 | 27.02.2017. | Concept development | Vera Petrović, VIŠER |
| 1.0 | 27.02.2017. | Concept development | Dragana Prokin, VIŠER |
| 1.1 | 29.05.2018. | Adjustment of report form  Translation of course content and method of teaching | Svetlana Štrbac-Savić, VIŠER |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

TABLE OF CONTENT:

[DOCUMENT CONTROL SHEET 2](#_Toc4497363)

[VERSIONING AND CONTRIBUTION HISTORY 2](#_Toc4497364)

[1. Part Time: Information Systems curriculum 5](#_Toc4497365)

[2. Program structure 5](#_Toc4497366)

[3. Subjects Syllabuses 7](#_Toc4497367)

[3.1. Mathematics in Engineering 7](#_Toc4497368)

[3.2. Electrical Engineering 8](#_Toc4497369)

[3.3. English Language 9](#_Toc4497370)

[3.4. German Language 10](#_Toc4497371)

[3.5. Management 11](#_Toc4497372)

[3.6. Application Software 12](#_Toc4497373)

[3.7. Introduction to Cloud Computing 13](#_Toc4497374)

[3.8. Marketing 14](#_Toc4497375)

[3.9. Basics of Informatics and Computing 15](#_Toc4497376)

[3.10. Internet Services 16](#_Toc4497377)

[3.11. Sales Management 17](#_Toc4497378)

[3.12. Introduction to Object Programming 18](#_Toc4497379)

[3.13. E-Business 20](#_Toc4497380)

[3.14. Business plan 21](#_Toc4497381)

[3.15. Probability and Statistics 22](#_Toc4497382)

[3.16. Introduction to Internet Technology 23](#_Toc4497383)

[3.17. Database programming 24](#_Toc4497384)

[3.18. Projects Management 25](#_Toc4497385)

[3.19. Web Design 26](#_Toc4497386)

[3.20. Е-Commerce 27](#_Toc4497387)

[3.21. Object Oriented Design 28](#_Toc4497388)

[3.22. Operating Systems 1 29](#_Toc4497389)

[3.23. Social Networks Analysis 30](#_Toc4497390)

[3.24. Computer Networking 32](#_Toc4497391)

[3.25. Business Communication 33](#_Toc4497392)

[3.26. E - Banking 34](#_Toc4497393)

[3.27. Information Systems Security 35](#_Toc4497394)

[3.28. Web Applications Programming 36](#_Toc4497395)

[3.29. Business Software 37](#_Toc4497396)

[3.30. Internet Programming 38](#_Toc4497397)

[3.31. Internship 39](#_Toc4497398)

[3.32. Internet of Things 39](#_Toc4497399)

[3.33. Programming of Mobile Devices 4](#_Toc4497400)0

[3.34. Data Analysis 41](#_Toc4497401)

[3.35. Entrepreneurship 42](#_Toc4497402)

[3.36. Information Systems 43](#_Toc4497403)

[3.37. Final Thesis 44](#_Toc4497404)

[4. REALIZATION OF PART-TIME STUDY PROGRAM INFORMATION SYSTEMS 46](#_Toc4497405)

[Part-time study 46](#_Toc4497406)

[Duration of study 46](#_Toc4497407)

[Sustainability of the program of study 46](#_Toc4497408)

[Quality of study 46](#_Toc4497409)

[Method of teaching organization 46](#_Toc4497410)

[Who can be part-time student? 47](#_Toc4497411)

[Enrollment and change study regime during the study 47](#_Toc4497412)

[Accreditation 47](#_Toc4497413)

[Financing of studies 47](#_Toc4497414)

# Part Time: Information Systems curriculum

Informatics is a part every segment of everyday life most of all business. Information systems study program should produce manpower to carry out digital transformation of business and administration in Serbia. Information systems program enables students to learn fundamental computer science concepts, as well as practical knowledge of programming, software development, and the latest technologies along with their application in business and business methods. Students can learn how to design, maintain and administrate information systems, storage big amounts of data and data mining methods. Also, students can learn how to create, design and administrate computer networks with special attention on security aspects.

This study program was chosen for part-time program because a lot of people who work in state administration and in other companies do not have knowledge to work in modern, dynamic and technologically dependent business environment and they need knowledge and skills which this program offers. Part-time study will enable them to work and study. This program is also intended for people who have other personal reasons for choosing this study regime.

# Program structure

Bachelor program Information Systems has 180 ECTS. Part-time students can choose 30 ECTS in one school year, but they must pay attention to choose subjects of 60 ECTS in total from every year of regular studies but not in one school year. The group of subjects from which they can make selection is the same as for regular students different is the minimum of ECTS for regular (60 ECTS) and part-time students per year.

According to curriculum of the program most subjects have 6 ECTS, except:

* [Engineering Mathematics](http://www.viser.edu.rs/predmeti.php?id=1891&plan_id=98) and [Electrical Engineering](http://www.viser.edu.rs/predmeti.php?id=1867&plan_id=98) 7 ECTS,
* English Language, German Language and [Internship](http://www.viser.edu.rs/predmeti.php?id=2051&plan_id=98) 4 ECTS
* [Final Work](http://www.viser.edu.rs/predmeti.php?id=300&plan_id=98) 8 ECTS.

Mandatory subjects are: [Engineering Mathematics](http://www.viser.edu.rs/predmeti.php?id=1891&plan_id=98) and [Electrical Engineering](http://www.viser.edu.rs/predmeti.php?id=1867&plan_id=98) in the first year of study, and [Internship](http://www.viser.edu.rs/predmeti.php?id=2051&plan_id=98) and [Final Work](http://www.viser.edu.rs/predmeti.php?id=300&plan_id=98) in the third year. All other subjects are elective. In the first year of study student must choose one of two foreign languages (English or German language). Also, in the second and third year of study student can choose two subjects from other studies programs in VISER.

The curriculum of Information Systems study program is listed in the Table below. Beside the name of the subject, Table provides:

* subject's position in the curriculum of the accredited program of basic studies in VISER;
* number of classes per week (classes of lectures + laboratory or auditory classes + additional forms of teaching);

Number of ECTS per subject based on corresponding accredited program of basic studies in VISER;

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Subject Name** | **Sem.** | **Number of classes** | **ESPB** |
| **1.** | Mathematics in Engineering | 1. | 3+3+0 | 7 |
| **2.** | [Electrical Engineering](http://www.viser.edu.rs/predmeti.php?id=1867&plan_id=98) | 1. | 3+3+0 | 7 |
| **3.** | English Language | 1. | 2+1+0 | 4 |
| **4.** | German Language | 1. | 2+1+0 | 4 |
| **5.** | Management | 1. | 2+3+0 | 6 |
| **6.** | Introduction to Cloud Computing | 1. | 2+3+0 | 6 |
| **7.** | Application Software | 1. | 2+3+0 | 6 |
| **8** | Internet Marketing | 2. | 2+3+0 | 6 |
| **9.** | [Basics of Informatics and Computing](http://www.viser.edu.rs/predmeti.php?id=288&plan_id=98) | 2. | 2+3+0 | 6 |
| **10.** | Internet Services | 2. | 2+3+0 | 6 |
| **11.** | [Sales Management](http://www.viser.edu.rs/predmeti.php?id=2190&plan_id=98) | 2. | 2+3+0 | 6 |
| **12.** | [Introduction to Object Programming](http://www.viser.edu.rs/predmeti.php?id=1289&plan_id=97) | 2. | 2+3+0 | 6 |
| **13.** | E-Business | 2. | 2+3+0 | 6 |
| **14.** | Business plan | 3. | 2+3+0 | 6 |
| **15.** | [Probability and Statistics](http://www.viser.edu.rs/predmeti.php?id=315&plan_id=97) | 3. | 2+3+0 | 6 |
| **16.** | [Introduction to Internet Technology](http://www.viser.edu.rs/predmeti.php?id=2147&plan_id=97) | 3. | 2+2+1 | 6 |
| **17.** | Database programming | 3. | 2+2+1 | 6 |
| **18.** | [Projects Management](http://www.viser.edu.rs/predmeti.php?id=2071&plan_id=98) | 3. | 2+3+0 | 6 |
| **19.** | Web Design | 3. | 2+3+0 | 6 |
| **20.** | [Е-Commerce](http://www.viser.edu.rs/predmeti.php?id=1847&plan_id=98) | 4. | 2+3+0 | 6 |
| **21.** | Object Oriented Design | 4. | 2+2+1 | 6 |
| **22.** | Operating Systems 1 | 4. | 2+2+1 | 6 |
| **23.** | Social Networks Analysis | 4. | 2+3+0 | 6 |
| **24.** | Computer networking | 4. | 2+2+1 | 6 |
| **25.** | Business Communication | 4. | 2+3+0 | 6 |
| **26.** | E – Banking | 5. | 3+2+0 | 6 |
| **27.** | I[nformation Systems Security](http://www.viser.edu.rs/predmeti.php?id=312&plan_id=98) | 5. | 3+0+2 | 6 |
| **28.** | [Web Applications programming](http://www.viser.edu.rs/predmeti.php?id=2135&plan_id=95) | 5. | 3+0+2 | 6 |
| **29.** | Business Software | 5. | 2+3+0 | 6 |
| **30.** | [Internet Programming](http://www.viser.edu.rs/predmeti.php?id=305&plan_id=98) | 5. | 3+0+2 | 6 |
| **31.** | [Internship](http://www.viser.edu.rs/predmeti.php?id=2051&plan_id=98) | 5. |  | 4 |
| **32.** | Internet of Things | 6. | 3+2+0 | 6 |
| **33.** | Mobile devices programming | 6. | 3+0+2 | 6 |
| **34.** | Data Analysis | 6. | 3+2+0 | 6 |
| **35.** | [Entrepreneurship](http://www.viser.edu.rs/predmeti.php?id=2158&plan_id=98) | 6. | 3+2+0 | 6 |
| **36.** | Information systems | 6. | 3+2+0 | 6 |
| **37.** | [Final Thesis](http://www.viser.edu.rs/predmeti.php?id=300&plan_id=98) | 6. |  | 8 |

# Subjects Syllabuses

Accreditation documentation of Information Systems program of basic studies in VISER (2017) contains the subjects syllabuses in Serbian language. Syllabuses of subjects that are planed for part-time bachelor Information System program are listed below.

## Mathematics in Engineering

|  |  |  |  |
| --- | --- | --- | --- |
| **Study Program:** Information Systems | | | |
| **Course Title:** Mathematics in Engineering | | | |
| **Course Status:** Compulsory | | | |
| **Nuber of ECTS:** 7 | | | |
| **Requirements:** None | | | |
| **Course Objectives:**  Master matrix, systems of equations, statements, functions, and integrals to allow monitoring of professional electric engineering subjects and extending the mathematical knowledge. | | | |
| **Course Otucomes:**  Students will be ableto solvecomplex mathematicaltasks related to theapplication of modernmathematicalmethods in theElectrical Engineeringfield. | | | |
| **Course Content:**  *Theoretical instruction:*   1. Real and complex numbers. 2. The concept of matrix characteristics and operations. 3. The concept of determinants and characteristics. Methods for calculation. 4. Matrix inverse. 5. Solving systems of linear equations. Gaussian, Kramer and matrix methods. 6. Functions: definition, basic properties, limit value 7. Functions: continuity and asymptotes. 8. Colloquium 1 9. Derivative оf functions. 10. Differential functions. 11. Monitoring performance of functions and drawing graphics. 12. Indefinite integrals. 13. Definite integrals. 14. Use of integrals. 15. Colloquium 2   *Practical instruction (Problem solving sessions/Lab work/Practical training):*  Practical classes follow a teaching program and go through the exercises in computer laboratory using software packages Octave and Maxima. | | | |
| **Textbooks and References:**   1. Savic, Z. Miskovic, A. Zekovic, *Matematika 1-udzbenik,* Visoka skola elektrotehnike i racunarstva, Beograd, 2010. 2. Savic, A. Zekovic, Matematika 1-prirucnik za laboratorijske vezbe, Visoka skola elektrotehnike i racunarstva, Beograd, 2010. 3. Kovacevic, Z. Miskovic, A. Savic, Matematika za inzenjere, Visoka skola elektrotehnike i racunarstva, Beograd, 2008. 4. Z. Miskovic, I. Kovacevic, A. Savic, *Zbirka resenih zadataka iz matematike sa pismenih ispita,* Visoka skola elektrotehnike i racunarstva, Beograd, 2007. 5. I. Kovacevic, A. Savic, *Matematika-prirucnik za laboratorijske vezbe,* Visoka skola elektrotehnike i racunarstva, Beograd, 2008. | | | |
| **Instruction methods:** Lectures, calculation exercises, laboratory exercises, consultations, term papers, defense laboratory exercises and written exam, oral exam. | | | |
| **Grading (maximum number of points: 100)** | | | |
| **Preliminary activities** | **Points** | **Final Exam** | **Points** |
| Lectures activities | *10* | Written exam | *0* |
| Practical work | *10* | Oral exam | *29* |
| Preliminary exams(s) | *51* |  |  |
| Seminar(s) | *0* |  |  |

## Electrical Engineering

|  |  |  |  |
| --- | --- | --- | --- |
| **Study Program:** Information Systems | | | |
| **Course Title:** Electrical Engineering | | | |
| **Course Status:** Compulsory | | | |
| **Nuber of ECTS:** 7 | | | |
| **Requirements:** None | | | |
| **Course Objectives:**  Acquisition of basic knowledge in the field of electrical engineering | | | |
| **Course Otucomes:**  Knowledge of operation and characteristics of generators, resistors, coils and capacitors in the networks with a time constant and alternating currents. | | | |
| **Course Content:**  *Theoretical instruction:*   1. Electrostatics Coulomb's law, electric field vector, the electric potential. 2. ElectrostaticsPotential difference and voltage, capacitors and capacitance. 3. Electrical networks with a time constant currents Electric current, electric circuits, resistance, resistors and conductors. 4. Electrical networks with a time constant currents Electrical work and power, sources of electric current; Kirchhoff’s laws. 5. Electrical networks with a time constant currents Solving electrical networks; electrical networks theorems: superposition theorem 6. Electrical networks with a time constant currents Thevenin`s theorem 7. Colloquium 1 8. ElectromagnetismMagnetic field, magnetic field of current contours in the vacuum 9. Electromagnetism Magnetic properties of materials, electromagnetic induction 10. ElectromagnetismInductive elements and inductance 11. Electrical networks with alternating currents Electrical network with alternating currents, R (resistive) elements (serial and parallel connection of resistors) 12. Electrical networks with alternating currentsL (inductive) and C (capacitive) elements (serial and parallel connection); power and power factor 13. Electrical networks with alternating currents Basic notions during the change of the working regime in electrical networks 14. Electrical networks with alternating currentsSolving electrical networks; 15. Colloquium 2   *Practical instruction (Problem solving sessions/Lab work/Practical training):*  Introduction to the software package Electronics Workbench (EWB). The basic elements, the sources of power supply, indicators and instruments in EWB. Ohm's law. Kirchhoff’s laws. Thevenin`s theorem. Resistor in the circuit of alternating current (AC circuit). Capacitor in AC circuit. Electromagnetic coil in AC circuit. Serial RLC circuit. Parallel RLC circuit. | | | |
| **Textbooks and References:**   1. SurutkaJ., Osnovi elektrotehnike-elektrostatika, stalne jednosmerne struje, Akademska misao, Beograd, 2005. 2. SurutkaJ., Osnovi elektrotehnike-elektromagnetizam, Akademska misao, Beograd, 2002. 3. SurutkaJ., Djekić M., Osnovi elektrotehnike-naizmenične struje, Tehnički fakultet, Čačak, 2000. | | | |
| **Instruction methods:**  Lectures, problem solving sessions, laboratory exercises, assignments, consultations, colloquiums, knowledge tests, final exam. | | | |
| **Grading (maximum number of points: 100)** | | | |
| **Preliminary activities** | **Points** | **Final Exam** | **Points** |
| Lectures activities | *10* | Written exam | *30* |
| Practical work | *10* | Oral exam |  |
| Preliminary exams(s) | *50* |  |  |
| Seminar(s) |  |  |  |

## 

## English Language

|  |  |  |  |
| --- | --- | --- | --- |
| **Study Program:** Information Systems | | | |
| **Course Title:** English Language | | | |
| **Course Status:** Optional | | | |
| **Nuber of ECTS:** 4 | | | |
| **Requirements:** none | | | |
| **Course Objectives:**  Is to train students to be able to communicate in English using general or professional terms | | | |
| **Course Outcomes:**  In the end of semester students will be able to communicate in English and to use professional literature | | | |
| **Course Content:**  *Theoretical instruction:*   1. Everyday uses of computers. Types of computers 2. Parts of computer. Keyboard and mouse 3. Interview: Student. Input devices 4. Output devices. English tenses – active form 5. Storage devices. Graphical user interface 6. Interview: Computing support assistant. English tenses – continuous form 7. Networks. Communications 8. The Internet 1: E-mail and newsgroups. The passive voice 9. The Internet 2: The World Wide Web. Interview: The website designer 10. World processing. Databases and spreadsheets 11. Graphics and multimedia. Indirect speach 12. Programming. Interview: Analyst/programmer. Low-level systems 13. Future trends. Sequence of tenses 14. Interview: IT Manager. Issues in computing 15. Careers in computing. Interview: Systems manager   *Practical instruction (Problem solving sessions/Lab work/Practical training):*  Reading, writing, pronunciation and listening acording to class subject | | | |
| **Textbooks and References:**   1. V. Jokanović, Practice English, Visoka škola elektrotehike i računarstva strukovnih studija, Beograd, 2015. 2. E. H. Glendinning, J. McEwan, Basic English for Computing, Oxford University Press, 2001. | | | |
| **Instruction methods:** Lectures, calculation exercises, laboratory exercises, consultations, term papers, defense laboratory exercises and written exam, oral exam. | | | |
| **Grading (maximum number of points: 100)** | | | |
| **Preliminary activities** | **Points** | **Final Exam** | **Points** |
| Lectures activities | *10* | Written exam | *30* |
| Practical work |  | Oral exam |  |
| Preliminary exams(s) | 60 | *..........* |  |
| Seminar(s) |  |  |  |

## German Language

|  |  |  |  |
| --- | --- | --- | --- |
| **Study Program:** Information Systems | | | |
| **Course Title:** German Language | | | |
| **Course Status:** Optional | | | |
| **Nuber of ECTS:** 6 | | | |
| **Requirements:** none | | | |
| **Course Objectives:**  Overcoming the most frequent form of vocabulary, spelling and basic phonological rules, as well as the base of grammar competence. | | | |
| **Course Outcomes:**  Upon completion of this course, students will be able to understand simple (written and spoken) texts as well as to conduct simple (written and oral) communication. Students will master the language to the extent that they can deal with everyday situations. | | | |
| **Course Content:**  *Theoretical instruction:*   1. Normative grammar of the German language - personal and confessional substitutes, 2. An indefinite and indefinite member, 3. Declination of members, adjectives, nouns and personal substitutes, 4. Singular and plural nouns, negations with "nicht" and "kein", 5. Conjugation of the most frequent verbs in the present, 6. The position of the verb in the sentence, 7. Colloquium 1 8. Explicit and questionable sentences, attachments for the place, time and manner 9. Structing vocabulary necessary for finding out in everyday situations. 10. Presentation, familiarity, family members, origin, housing, colors, shopping, 11. Basic concepts in electrical engineering, 12. Electrical engineering in technique, 13. Basic concepts from computing, 14. Informatics and Computing. 15. Colloquium 2   *Practical instruction (Problem solving sessions/Lab work/Practical training):*  Exercises, discussion with students, dialogue / vocal exercises, check of acquired knowledge, analysis of practical work, consultations | | | |
| **Textbooks and References:**   1. B.Monika, N..Daniela, P.Hiemstra, S.Reimann, M.Specht, Franz, *Schritte international 1* (Kursbuch + Arbeitsbuch + CD). Hueber Verlag, 2006. 2. K.Petra, K.Kienle, Isabel,*Schritte international 1*(Lehrerhandbuch). Hueber Verlag, 2006. 3. Двојезични речник (Langenscheidt, PONS) | | | |
| **Instruction methods:** Lectures, calculation exercises, laboratory exercises, consultations, term papers, defense laboratory exercises and written exam, oral exam. | | | |
| **Grading (maximum number of points: 100)** | | | |
| **Preliminary activities** | **Points** | **Final Exam** | **Points** |
| Lectures activities | *5* | Written exam | *25* |
| Practical work | 5 | Oral exam | *25* |
| Preliminary exams(s) | *40* |  |  |

## Management

|  |  |  |  |
| --- | --- | --- | --- |
| **Study Program:** Information Systems | | | |
| **Course Title:** Management | | | |
| **Course Status:** Optional | | | |
| **Number of ECTS:** 6 | | | |
| **Requirements:** None | | | |
| **Course Objectives:**  The aim of this course is to acquiring theoretical and practical knowledge and modern methods and techniques which can be used in the field of business systems | | | |
| **Course Otucomes:**  After completing this course, students will be able for using knowledge, modern methods and techniques in the process of planning, organizing, managing and controlling the various operations, enterprise, organization system parts and / or. organizational system as a whole. | | | |
| **Course Content:**  *Theoretical instruction:*   1. Definition of Management Processes 2. History management development 3. Process control 4. Functional fields of management 5. Sub-Process -Planning 6. Sub-Process -Organizing 7. Sub-Process -Recruitment 8. Sub-Process - Leadership 9. Sub-Process -Control 10. Manager 11. Leadership 12. Inovation management 13. Change management 14. Communications management 15. Knowledge management   *Practical instruction (Problem solving sessions/Lab work/Practical training):*  Methods and techniques for the implementation of the process of planning, organizing, leading and controlling. Models of organization. Decision-making and modern methods for making business decisions. Quality as a competitive advantage. Contemporary theories of motivation.The roles and tasks of managers. Building a career. Stress management. Groups and converting groups in effective teams. Case studies. | | | |
| **Textbooks and References:**   1. Ž. Vasić, D. Sajfert, M. Jevremović:Osnovi menadžmenta, VIŠER, Beograd, 2013. 2. Petar Jovanović: Menadžment, teorija i praksa, FPM, Beograd, 2015. 3. Chuck W., Principi menadžmenta, DataStatus, Beograd, 2013. | | | |
| **Instruction methods:**  Lectures, problem solving sessions, assignments, consultations, preliminary exams, knowledge tests, final exam. | | | |
| **Grading (maximum number of points: 100)** | | | |
| **Preliminary activities** | **Points** | **Final Exam** | **Points** |
| Lectures activities | *5* | Written exam | *30* |
| Practical work | *15* | Oral exam |  |
| Preliminary exam(s) | *50* |  |  |
| Seminar(s) |  |  |  |

## Application Software

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Study Program:** Information Systems | | | | | |
| **Module title:** Application software | | | | | |
| **Lecturer:** Professor Jelena Mitić**,** MSc | | | | | |
| **Module status:** Optional | | | | | |
| **ECTS credits:** 6 | | | | | |
| **Prerequisites:** Basic computers skills and literacy, knowledge of operating systems and file management. | | | | | |
| **Aims:**  This module is designed to provide necessary understandingof standard application software usage and introduction to digital society. | | | | | |
| **Learning outcomes:**  On successful completion of this module, students should be ableto understand principles of application software and qualified to use word processors, spreadsheets, presentation design software as well as basic Internet services. | | | | | |
| **Course Content:**  Lectures:   1. Introductory lecture (the organization and content of the module). Мicrosoft Office, Libre Office. 2. Basic word processing techniques. 3. Entering and editing text, formatting text, characters, paragraphs and pages. 4. Advanced word processing techniques. Embedding objects in text. 5. Tables. Equation editor. 6. Processing longer texts. Styles. 7. Spreadsheets. Basic concepts. 8. Edit cell content, editing a worksheet.. 9. Formatting spreadsheets. Examples. 10. Functions, basic application techniques. 11. Diagrams. Databases. Advanced techniques. 12. Presentations. Basic rules presentation creation and display techniques. Slide creation. 13. Presentations. Handling slide components. Installation of object. Animation. 14. Internet services. Web search engines, e-mail, discussion lists, publishing presentations on the Internet. 15. Combined use of different programs.   Tutorial:  Tuition is in compliance to the curriculum. | | | | | |
| **Readings:**   1. R. Vukić, D. Perić, I. Vlajić-Naumovska (2011): Aplikativni softver, 3. izdanje. VIŠER, Beograd. 2. ECDL official literature: modules 3,4,6 and 7. | | | | | |
| **Teaching units: 75** | | | | | **Other classes** |
| Lectures: | Tutorials: | Other forms of teaching: | | Research study: |  |
| **2** | **3** |  | |  |
| **Teaching methods:**  Lectures, practical lab classes, consultation, colloquia, seminar papers and written exam. | | | | | |
| **Assessment methods (maximum number of points 100)** | | | | | |
| **Pre-exam obligations** | | | Points | **Final exam** | Points |
| Student’s engagement | | |  | Written exam | 40 |
| Tutorials | | |  | Viva |  |
| Colloquia | | | 20 |  |  |
| Seminar paper(s) | | | 40 |  |  |

## Introduction to Cloud Computing

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Study Program:** Information Systems | | | | | |
| **Module title:** Introduction to Cloud Coputing | | | | | |
| **Lecturer:** Professor Borislav Đorđević, PhD | | | | | |
| **Module status:** Optional | | | | | |
| **ECTS credits:** 6 | | | | | |
| **Prerequisites:** Operatings system and networking literacy. | | | | | |
| **Aims:**  This module is designed to provide introduction to fundamental cloud computing concepts. | | | | | |
| **Learning outcomes:**  On successful completion of this module, students should be qualified to use modern technologies within the cloud computing domain. | | | | | |
| **Course Content:**  Lectures:   1. Computer architecture fundamentals. 2. Operating system fundamenals. 3. Computer network and security fundamentals. 4. Introduction to virtualization. 5. Types of virtualization. 6. Server virtualization and desktop virtualization. 7. Introduction to Cloud Computing. 8. Cloud Computing models. 9. Software as a Service. 10. Google Apps, Microsoft Office 365. 11. Platform as a Service. 12. Google App Engine, Microsoft Azure 13. Infrastructure as a Service. 14. Amazon CloudFormation (EC2). 15. Overall discussion.   Tutorial:  Tuition is in compliance to the curriculum. | | | | | |
| **Readings:**   1. A. Silberschatz, P. Galvin, G. Gagne (2009): Operating System Concepts, 8th edition. John Wiley&Sons, Inc. 2. B. Đorđević, D. Pleskonjić, N. Maček (2006): Operativni sistemi: teorija praksa i rešeni zadaci. Mikro Knjiga, Beograd. 3. Thomas Erl, Ricardo Puttini, Zaigham Mahmood (2014): Cloud Computing: Concepts, Technology & Architecture. Prentice Hall. 4. Matthew Portnoy (2012): Virtualization Essentials. Sybex. 5. Gustavo A. A. Santana (2014): Data Center Virtualization Fundamentals. Cisco System Inc. 6. Rogier Dittner, David Rule Jr. (2007): The Best Damn Server Virtualization Book Period. Elsevier Inc. | | | | | |
| **Teaching units: 75** | | | | | **Other classes** |
| Lectures: | Tutorials: | Other forms of teaching: | | Research study: |  |
| **2** | **3** |  | |  |
| **Teaching methods:**  Lectures, practical lab classes, consultation, colloquia, seminar papers and written exam. | | | | | |
| **Assessment methods (maximum number of points 100)** | | | | | |
| **Pre-exam obligations** | | | Points | **Final exam** | Points |
| Student’s engagement | | | 10 | Written exam | 70 |
| Practical lab-classes | | | 20 | Viva |  |
| Colloquia | | |  |  |  |
| Seminar paper(s) | | |  |  |  |

## Marketing

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Study Program**: Information Systems | | | | |
| **Module title:** Introduction to Cloud Coputing | | | | |
| **Lecturer:** Professor Milica Jevremović, PhD | | | | |
| **Module status:** Optional | | | | |
| **ECTS credits:** 6 | | | | |
| Prerequisites: None | | | | |
| **Learning outcomes:**  After the course is over, students will be trained to plan, monitor and control the marketing process in the company itself. Students will also be trained to independently present on the Internet. | | | | |
| **Course Content:**   |  | | --- | | *Lectures:*   1. Marketing as a business function. 2. Business marketing activities. 3. Procedure and methods of market research 4. Quantitative and qualitative research methods in marketing 5. Survey of the environment in market research market 6. Segmentation of the market and selection of market segments 7. First colloquium 8. Strategies and tactics of marketing 9. Control of marketing activities 10. Marketing Management in Electronic Commerce 11. Internet marketing plan 12. Tools of marketing mix in electronic commerce 13. Marketing information system 14. Second colloquium | | *Practical instruction:* | | 1. Types and Structure of Online Appearances; 2. Internet Marketing Plan: Market Analysis; 3. Creating Online Marketing Strategies and Online Concept Concepts; 4. Planning the Internet Marketing Budget; 5. Forming a team and defining timetables; 6. Work on multiple Online platforms and with several different marketing tools. | | | | | |
| **Literatura**   1. Filipović V., Kostić-Stanković M., *Marketing menadžment*, Data status, Beograd, 2006. 2. Kotler P., Lane K., Martinovic M., *Upravljanje marketingom*, Mate, Zagreb, 2014 . 3. Chaffey D., Smith PR., *eMarketing eXcellence: Planning and optimizing your digital marketing*, 4th edition, Abingdon, Oxon: Routledge, 2013. | | | | |
| **Broj časova aktivne nastave** | **Teorijska nastava:** 2 | | **Praktična nastava:** 3 | |
| **Metode izvođenja nastave**  Predavanja, auditorne vežbe, laboratorijske vežbe, konsultacije, kolokvijum, pismeni ispit. | | | | |
| **Grading (maximum number of points: 100)** | | | | |
| **Preliminary activities** | **Points** | **Final Exam** | | **Points** |
| Lectures activities | 20 | Written exam | | 50 |
| Practical work | 30 | Oral exam | |  |
| Preliminary exams(s) |  |  | |  |
| Seminar(s) |  |  | |  |

## Basics of Informatics and Computing

|  |  |  |  |
| --- | --- | --- | --- |
| **Study Program:** Information Systems | | | |
| **Course Title:**Basics of Infornatics and Computing | | | |
| **Course Status:** Optional | | | |
| **Nuber of ECTS:** 6 | | | |
| **Requirements:**None | | | |
| **Course Objectives:**  Acquiring basic knowledge of informatics, architecture of computer, computer system and its components and prerequisites for programming. | | | |
| **Course Otucomes:**  After completing this course students will have basic knowledge about structures of data, system software, architecture and organization of computer and capability of defining procedure for solving tasks through designing algorithms using basic structures of programming. | | | |
| **Course Content:**  *Theoretical instruction:*   1. Introduction to computer processing of information. Historical development of computer resources. 2. Introduction to information systems. Definition and types, methods of projecting information systems. 3. Modern programming tools. 4. Operating systems, historical review and modern operating systems. 5. General model of computer system. Functional block scheme of computer. Hierarchical model of computer system. 6. Mathematical basics of computer. Number systems. Conversions from one number system to another. 7. Binary number system. Signed and unsigned numbers. 8. Inscription in format of fixed and moving comma. Basic arithmetical operations in binary number system. 9. Inscription in code "8421" and "more 3 ". Arithmetical operations on binary coded numbers. 10. Electronic basis of computer. Logical operations, basic logical circuits and nets . Decoders, multiplexers, semi adders, adders. 11. Computer hardware. Simplified architecture of computer. Buses, input, output and memory access. 12. Peripheral units. Modes of transfer input/output data. Devices for input and publishing of data. 13. Basics of programming. Solving of tasks using computers. 14. Algorithms. Quality of algorithms. Methods for describing of algorithm: flow chart. Basic programming structures. 15. Protection of computer resources and systems.   *Practical instruction (Problem solving sessions/Lab work/Practical training):*  Follows the lectures. | | | |
| **Textbooks and References:**   1. V Petrović, Obradović S. M. Mijalković, *Osnovi informatike i računarstva*, VISER, Beograd, 2009. 2. V Petrović, *Osnovi informatike i računarstva-priručnik*, VISER, Beograd, 2010. 3. Prokin D., Petrović V., Mijalković M., *Zbirka zadataka iz Osnova računarske tehnike*, Viša elektrotehnička škola, Beograd, 2011. | | | |
| **Instruction methods:**  Lectures, auditory exercises, laboratory exercises. | | | |
| **Grading (maximum number of points: 100)** | | | |
| **Preliminary activities** | **Points** | **Final Exam** | **Points** |
| Lectures activities | 10 | Written exam | 30 |
| Practical work | 20 | Oral exam |  |
| Preliminary exams(s) | 40 |  |  |
| Seminar(s) |  |  |  |

## Internet Services

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Study Program:** Information Systems | | | | | |
| **Module title:** Internet services | | | | | |
| **Lecturer:** Professor Branimir Trenkić, PhD | | | | | |
| **Module status:** Optional | | | | | |
| **ECTS credits:** 6 | | | | | |
| **Prerequisites:** Basic computer skills and literacy. | | | | | |
| **Aims:**  This module is designed to provide necessary understandingof the most important Internet services. | | | | | |
| **Learning outcomes:**  On successful completion of this module, students should be qualified to use the most important Internet services. | | | | | |
| **Module content:**  Lectures:   1. Internet fundamentals. 2. Connecting to the Internet. Dial-Up connection. DSL connection. 3. Broadband internet. Access via GPRS and G3 (UMTS) mobile phone networks. Wireless access. 4. URL. Domains. registration to international and local domains. 5. Internet syntax. 6. E-mail service. 7. Internet protection. 8. Web service. Browsing the Web. Advanced Google search. 9. On–line shopping, travel and economies on the Internet. 10. Multimedia on the Internet. Photos, music and sounds, videos, movies and TV. 11. Social networks. Facebook and Twitter. 12. Client relationship management via Facebook and Twitter. 13. Blog. Maintaining public relations via blogging. 14. Internet telephony (VoIP). Similarities and differences between landline and Internet telephony, 15. Equipment for internet telephony. Internet clients Skype, Viber, Webex.   Tutorial:  Tuition is in compliance to the curriculum. | | | | | |
| **Readings:**   1. P. Staletić (2001): Internet servisi u poslovnoj komunikaciji. VETŠ, Beograd. 2. P. Staletić (2016): Priručnik iz Internet servisi u poslovnoj komunikaciji. VIŠER, Beograd. 3. M. Jakobsson (2012): The Death of The Internet. Wiley & Sons. | | | | | |
| **Teaching units: 75** | | | | | **Other classes** |
| Lectures: | Tutorials: | Other forms of teaching: | | Research study: |  |
| **2** | **3** |  | |  |
| **Teaching methods:**  Lectures, practical lab classes, consultation, colloquia, seminar papers and written exam. | | | | | |
| **Assessment methods (maximum number of points 100)** | | | | | |
| **Pre-exam obligations** | | | Points | **Final exam** | Points |
| Student’s engagement | | | 10 | Writen exam |  |
| Practical lab-classes | | | 20 | Viva | 50 |
| Colloquia | | | 20 |  |  |
| Seminar paper(s) | | |  |  |  |

## Sales Management

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Study Program:** Information Systems | | | | | |
| **Module Title:** Sales management | | | | | |
| **Lecturer (First name, middle initial, and last name):** Milica Jevtemovič, Phd | | | | | |
| **Module Status:**optional | | | | | |
| **ECTS credits:**6 | | | | | |
| **Prerequisites:** None | | | | | |
| **Aims:** The aim of thid module is acquiring practical and theoretical skills on direct sales and sales management, implemented by manufacturers and trade companies, complemented by its own direct sales channel | | | | | |
| **Learning outcomes:** Students are qualified to successfully service to promoting goods and services to consumers. | | | | | |
| **Module content:**  *Lectures*  1. Introduction to sales management. Term, tasks, and responsabilities of sales management.  2. Sales management marketing aspects. Instruments of marketing mix.  3. Sales management and quality of products and services. Sales management and information and commnunication technology.  4. Forms of sales. Direct indirect and sales by the means of corporate multimedia information systems.  5. Sales activities plannning. Strategic business planning and sales management process  6. Sales activities organisation. Forms of organized salse. Salesman role.  7. First colloquium.  8. Pricing policy as key factor of succesfull sales of products and services.  9. Pricing policy towards customers. Pricing policy towards competitors.  10. Psychological aspects of company pricing policy.  11. Managerial price decision: Targeting pricing. Demand analysis. Cost Estimates. Analysis of the competitive price and products and services.  12. Sale price formation under different market conditions: Prices in perfect competition. Monopoly price. Oligopoly price.  13. Motivation and reward of sellers: find potential sellers and select the best candidates.  14. Continuous training for sales staff. Sales manager as leaders.  15. Sales analysis, cost analysis of marketing and sales team performance evaluation  16. Second colloquium(s).  *Practical lab-classes*  During tutorials students are discussing about concrete examples from the practice on the topics in compliance to the curricula. | | | | | |
| **Reading:**  1. Др Милан Гашовић, *Менаџмент продаје*, Економски факултет Суботица, 2010.  2. Webлокација: [*http://salesmanagement20.com*/](http://salesmanagement20.com/) | | | | | |
| **Teaching units:75** | | | | | **Other classes** |
| Lectures: | Tutorials: | Other forms of teaching: | | Research study: |  |
| 2 | 3 |  | |  |
| **Teaching methods:**  Lectures, auditory exercises, consultations, colloquium(s), seminar paper(s), final exam. | | | | | |
| **Assessment methods (maximum number of points 100)** | | | | | |
| **Pre-exam obligations** | | | **Points** | **Final exam** | **Points** |
| Students’ engagement | | | 10 | written exam |  |
| practical lab-classes | | | 20 | Viva | 50 |
| colloquium(s) | | | 20 |  |  |

## Introduction to Object Programming

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Study Program:** Information Systems | | | | | |
| **Module title:** Introduction to Object Programming | | | | | |
| **Lecturer:** Professor Svetlana Štrbac-Savić, PhD | | | | | |
| **Module status:** Optional | | | | | |
| **ECTS credits:** 6 | | | | | |
| **Prerequisites:** None | | | | | |
| **Aims:**  The aim of this module is to introduce students to the basic techniques of visual, object-oriented programming, data type event-driven programming and algorithmic structure. Object and controls are performed in *VisualBasic* programming language. | | | | | |
| **Learning outcomes:**  Students shall be qualified to independenlty design simple application, use complex data structure and work with object and database. | | | | | |
| **Module content:**  *Lectures:*  1. Data structure. Data type, variables, declarations, conversion type.  2. Programming. Branching, cyclic algorithmic structure. Elementary programming examples.  3. Basic aspects of object-oriented programming. Concept of class, object properties and methods.  4. Object-oriented programming techniques. Prototypes, graphical user interface (GUI).  5. Elements of graphical interface. Main objects: button, text field, features, photos, graphics, button, check box, radio buttons, lists, drop-down list.  6. Events. The concept of event-based programming, event type, event handling procedures.  7. Arguments. Use and types of arguments. Argument forwarding.  8. Testing and maintenance program. Error processing and grabbing, selection of test sample.  *Tutorials:*  1. Practical part analysies concrete visual object-oriented programming language (Visual Basic), its graphics environment, use of ready objects.  2. Introduction to Visual Basic environment.  3. Programs with a simple linear structure.  4. Operations with controls and design of installation application version  5. Structured Programming Branching (IfThenElse, CASE).  6. Use of CheckBox control and dynamic control positioning on a form.  7. Cyclic program structure-loops (DOLOOPWHILE, FOR, REPEAT UNTIL...).  8. Procedure application.  9. Drop-down menu and decimal point application.  10. Operations with files, textual and binary.  11. Operations with qeues and matrices.  12. Operation with the class.  13. User-defined control design.  Curriculum in compliance to the recommendations EEE/ACMComputingCurriculum: IT2008 Information Technology Body of Knowledge: IT-PF 1, 5. | | | | | |
| **Reading:**  1. С. Обрадовић, Б. Павић, С. Месаровић, С. Илић, *Принципи објектно оријентисаног програмирања – Visual Basic,* 2. издање, Виша електротехничка школа, Београд, 2008.  2. С. Обрадовић, Б. Павић, С. Месаровић, Б. Богојевић, *Visual Basic NET, приручник за лабораторијске вежбе,* 2. издање, Виша електротехничка школа, Београд, 2010. | | | | | |
| **Teaching units:75** | | | | | **Other classes** |
| Lectures: | Tutorials: | Other forms of teaching: | | Research study: |  |
| 2 | 3 |  | |  |
| **Teaching methods:**  Lectures, consultations, auditory and lab tutorials | | | | | |
| **Assessment methods (maximum number of points 100)** | | | | | |
| **Pre-exam obligations** | | | **Points** | **Final exam** | **Points** |
| Students’ engagement | | | 10 | written exam | 70 |
| practical lab-classes | | | 20 | viva |  |
| colloquium(s) | | |  |  |  |
| seminar paper(s) | | |  |  |  |

## E-Business

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Study Program:** Information Systems | | | | | |
| **Module Title:** Basics of e-business | | | | | |
| **Lecturer (First name, middle initial, and last name):** Professor Dejan V.Tosic | | | | | |
| **Module Status:** Compulsory | | | | | |
| **ECTS credits: 6** | | | | | |
| **Prerequisites** Basic understanding of electrical engineering and mathematics enables successful following up of lectures. | | | | | |
| **Aims:**  Introduce students to basic terms on e-business (EB), through sequence of practical examples. Trigger off students to independently search and analyse by means of Internet service and tools. | | | | | |
| **Learnig outcomes:**  On successful completion of this module, students should be able to critically consider automatization of small enterprise operations, as well as operative decision making on the scope of EB enterprise, EB implementation, and follow up of EB efficiency**.** | | | | | |
| **Module content**  *Lectures*  1. Conceptual determination of digital economy, e-business, e-commerce and m-business.  2. Importance, advantages and novelty EB brings.  3. EB based technology overview.  4. Internet and EB globalisation. Role of internet browser in EB.  5. EB strategies.  6. Products and services convenient for placement via Internet.  7. E-business principles – Big 3 and requested answer.  8. Application and software components of ЕB (е-shop, е-auction, digital libraries, etc.)  9. RFID application within ЕB.  10. Basics of е-banking (e-banking, e-finance, e-payment, etc.)  11. Basics of e-government.  12. Basicsof e-learning, distance learning.  13. E-SCM, e-CRM, e-ERP, e-marketing and e-CMS.  14. Example of development and application of EB enterprise in Serbia.  15. Self-evaluation, module analysis, students’ survey.  *Tutorial:*  Comparative analysis of Internet browser from the point of EB. Concept of small Internet business. Analysis of commercial and banking sites. | | | | | |
| **Reading:**  1. М. Лутовац, В. Поцајт, Д. Тошић, *Основи електронског пословања*, Висока школа електротехнике и рачунарства, Београд, 2007.  **2.** М. Лутовац, Д. Тошић, *Приручник из основа електронског пословања*, Висока школа електротехнике и рачунарства, Београд, 2007. | | | | | |
| **Teaching units: 75** | | | | | **Other classes** |
| Lectures: | Tuition: | Other forms of lecturing: | | Research study: |
| 2 | 3 |  | |  |
| **Teaching methods:**  Lectures, practical lab-class, consultations and viva | | | | | |
| **Assessment methods (maximum number of points 100)** | | | | | |
| **Pre –exam obligations** | | | **Points** | **Final exam** | **points obligations** |
| Student’s engagement | | | 10 | Written exam |  |
| Tutorials | | | 30 | Viva | 30 |
| Colloquim(s) | | | 30 |  |  |
| Seminar paper(s) | | |  |  |  |

## Business plan

|  |  |  |  |
| --- | --- | --- | --- |
| **Study Program:** Information Systems | | | |
| **Course Title:** Business Plan | | | |
| **Course Status:** Optional | | | |
| **Nuber of ECTS:** 6 | | | |
| **Course Objectives:**  Teach students basic ideas, concepts and the structure of business plan with the emphasis on the modern format of the business plan for a contemporary electronic business of small and medium enterprises. | | | |
| **Course Outcomes:**  Students are being trained for critical and expert considerations of business of a future small and medium enterprise, as well as for preparation, organization and writing the business plan for the enterprise. | | | |
| **Course Content:**  *Theoretical instruction:*   1. The concept of business plan. 2. Mission and vision. 3. Business processes and the enterprise description. 4. Business goals and objectives. 5. Market analysis (Marketing plan). 6. Analysis of competition. 7. Financial analysis (Financial plan). 8. Colloquium 1. 9. Risk analysis. 10. Phases, tasks and milestones in the project of an e-business. 11. Software based specification of business processes. 12. Executive summary. 13. Format and presentation of business plan. 14. Defending business plan in front of investors. 15. Colloquium 2.   *Practical instruction (Problem solving sessions/Lab work/Practical training):*  Through practical classes, students will pass through case studies in which they will be able to use the acquired knowledge at the theoretical lessons in order to solve specific problems presented in these case studies. | | | |
| **Textbooks and References:**   1. M. D. Lutovac, D. V. Tošić, *Biznis plan za elektronsko poslovanje,* Beograd, VETŠ, 2006. 2. M. D. Lutovac, D. V. Tošić, *Priručnik: Biznis plan za elektronsko poslovanje,* Beograd, VETŠ, 2007. | | | |
| **Instruction methods:**  Lectures. Laboratory work. | | | |
| **Grading (maximum number of points: 100)** | | | |
| **Preliminary activities** | **Points** | **Final Exam** | **Points** |
| Lectures activities |  | Written exam | 40 |
| Practical work |  | Oral exam |  |
| Preliminary exam(s) | 20 |  |  |
| Seminar(s) | 40 |  |  |

## Probability and Statistics

|  |  |  |  |
| --- | --- | --- | --- |
| **Study Program:** Information Systems | | | |
| **Course Title:** Probability and Statistics | | | |
| **Course Status:** Optional | | | |
| **Nuber of ECTS:** 6 | | | |
| **Requirements:** None | | | |
| **Course Objectives:**  To trainstudents to make decisions in planning or management related to knowledge of probability. | | | |
| **Course Otucomes:**  At the end of the course, students will be able to design and solve software and process quality problems, analyze data from different sources and understand the importance of empirical methods in software engineering. | | | |
| **Course Content:**  *Theoretical instruction:*   1. Introduction to Probability and Counting. 2. Conditional Probability and Independence. 3. Discrete Random Variables. 4. ContinuousRandom Variables. 5. Distributions Basic Terms. 6. Binomial Distribution and Poisson Distribution. 7. Normal Distribution. 8. Expectation and Distribution Parameters. 9. Functions of Random Variables. 10. Central Limit Theorem. 11. Random Processes. 12. Introduction to Mathematical Statistics. 13. Parameter Estimation. 14. Testing Statistical Hypothesis. 15. Applied Statistics in Engineering   *Practical instruction (Problem solving sessions/Lab work/Practical training):*  Practical classes follow the program of lectures and take place through exercises in the computer laboratory, using the software package Octave. | | | |
| **Textbooks and References:**   1. S. Strbac-Savic, A. Savic, Verovatnoca i statistka, VISER, Beograd, 2013. 2. A. Savic, S. Strbac-Savic, A. Zekovic, Verovatnoca i statistika - prirucnik za laboratorijske vezbe, VISER, Beograd, 2011. 3. S. Cvetkovic, Elementi teorije verovatnoce i matematicke statistike, Akademska misao, Beograd, 2004. | | | |
| **Instruction methods:**  Lectures, problem solving sessions, laboratory exercises, consultations, colloquiums, homework, ,final exam. | | | |
| **Grading (maximum number of points: 100)** | | | |
| **Preliminary activities** | **Points** | **Final Exam** | **Points** |
| Lectures activities | 10 | Written exam | 30 |
| Practical work | 20 | Oral exam | 10 |
| Preliminary exams(s) | 30 |  |  |
| Seminar(s) |  |  |  |

## Introduction to Internet Technology

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Study Program:** Information Systems | | | | | |
| **Module Title:** Introduction to Internet technology | | | | | |
| **Lecturer (Name, middle initial, surname):** Zoran, Ćirović, Phd | | | | | |
| **Module Status:** Optional | | | | | |
| **ECTS credits:**6 | | | | | |
| **Prerequisites:** Understanding of PC operations and programming basics | | | | | |
| **Aims:**  The aim od this module is to introduce students to basic internet technology and to qualify to independently design Inetrenet presentations using acquired skills. | | | | | |
| **Learning outcomes:**  Studnets shall understand and use existing Internet technologies and tools in order to independently design static presentations on the Internet. | | | | | |
| **Module content:**  *Lectures:*  1. Introduction. History, basic terms and concepts. Computer networks, topology and stratification.  2. Internet Services and Protocols: www, email, ftp, telnet ... Browser role.  3. 3-tier Internet applications. Speech synthesis markup languages.  4. Page web design. Client part of applications: Fundamentals of HTML / XHTML languages.  5. Operations with linking elements and multimedia in HTML / XHTML.  6. Formatting based on CSS.  7. Operations with style classes, and heritage.  8. Concept of server application. Introduction to client-side scripts. Document Object Model - DOM, Javascript.  9. Basics of JavaScript language: Script languages ​​and web browsers. Basic language syntax.  10. Basics of Internet security.  11. Application uploading to the Internet, service properties and maintaining tools.  12. XML technology. Validation basics: DTD, schemas and XSLT transformation.  *Tutorials:*  Practical lab-classes in compliance to the lectures and performed by demonstration of commercial applications and implementation of the above mentioned technologies. | | | | | |
| **Reading:**  1. Ф. Марић, *Увод у Веб и Интернет технологије,* Природно-математички факултет, Београд, 2011.  2. 2.Б. Николић, *Интернет програмирање, електронско издање* Виша електротехничка школа Београд,  2005.  3. J.N.Robbins, *Naučite Web dizajn* Mikro knjiga 2009 | | | | | |
| **Teaching units:75** | | | | | **Other classes** |
| Lectures: | Tutorials: | Other forms of teaching: | | Research study: |  |
| 2 | 2 | 1 | |  |
| **Teaching methods:**  Lectures, consultations, practical lab-classes and project | | | | | |
| **Assessment methods (maximum number of points 100)** | | | | | |
| **Pre-exam obligations** | | | **Points** | **Final exam** | **Points** |
| Students’ engagement | | | 10 | PC exam | 40 |
| practical lab-classes | | | 20 |  |  |
| colloquium(s) | | | 20 |  |  |
| seminar paper(s) | | | 10 |  |  |

## Database programming

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Study Program:** Information Systems | | | | | |
| **Module title:** Database programming | | | | | |
| **Lecturer:** Professor Danijela Milošević, PhD | | | | | |
| **Module status:** Optional | | | | | |
| **ECTS credits:** 6 | | | | | |
| **Prerequisites:** Basic computers skills and literacy, knowledge of operating systems and file management. | | | | | |
| **Aims:**  This module is designed to provide necessary understandingof databases and SQL queries, their application in the information systems, and the MS Access database management system. | | | | | |
| **Learning outcomes:**  On successful completion of this module, students should be qualifiedto design relational databases, develop accompanying applications and use SQL queries over complex relational databases. | | | | | |
| **Module content:**  Lectures:   1. Data models. 2. Relational databases. 3. Primary and forein key, key constraints. 4. Database management systems. 5. Fundamentals of query langauges. 6. Relational algebra. 7. SQL and QBE query languages. 8. Aggregate functions. 9. Parametrized queries. 10. Permissions and roles. 11. Stored procedures and triggers. 12. Designing relational databases 13. 1NF, 2NF, 3NF and Boyce-Codd normal forms. 14. Transaction processing system. 15. Physical database design.   Tutorial:  Designing databases and accompanying applications with Microsoft Access. | | | | | |
| **Readings:**   1. P. Kaluđerčić, S. Obradović (2015): Projektovanje informacionih sistema i relacione baze podataka). VIŠER, Beograd, 2015. 2. S. Obradović, T. Pandurov, B. Bojičić (2015): SQL struktuirani upitni jezik. VIŠER, Beograd, 2015. 3. S. Obradović, B. Pavić, V. Petković, G. Dimić (2015): MS Access 2013 – projektovanje baza podataka i aplikacija. VIŠER, Beograd, 2015. | | | | | |
| **Teaching units: 75** | | | | | **Other classes** |
| Lectures: | Tutorials: | Other forms of teaching: | | Research study: |  |
| **2** | **3** |  | |  |
| **Teaching methods:**  Lectures, practical lab classes, consultation, colloquia, seminar papers and written exam. | | | | | |
| **Assessment methods (maximum number of points 100)** | | | | | |
| **Pre-exam obligations** | | | Points | **Final exam** | Points |
| Student’s engagement | | | 10 | Written exam | 35 |
| Practical lab-classes | | | 20 | Viva | 35 |
| Colloquia | | |  |  |  |
| Seminar paper(s) | | |  |  |  |

## Projects Management

|  |  |  |  |
| --- | --- | --- | --- |
| **Study Program:** Information Systems | | | |
| **Course Title:** Project Management | | | |
| **Course Status:** Elective | | | |
| **Number of ECTS:** 6 | | | |
| **Requirements:** None | | | |
| **Course objectives:**  To provide students with theoretical and practical knowledge and skills in the management of a variety of investment, business and social projects. | | | |
| **Course Outcomes:**  After passing the exam, students will be able to apply practical knowledge in the planning process, monitoring and control project implementation, with particular emphasis on monitoring and control of time, resources and costs, as well as the management of specialized management disciplines. | | | |
| **Course Content:**  *Theoretical instruction:*   1. Concept and types of projects 2. Project management concept 3. Organization for project management 4. Management of human resources 5. Project manager 6. Methods and techniques of project management 7. Planning project implementation 8. Monitoring and control of the project 9. Reporting system of the project realization 10. Standard computer packages for project management 11. Contract management 12. Quality management 13. Risk management 14. Communications management   *Practical instruction (Problem solving sessions/Lab work/Practical training):*  It takes place in a computer lab with the use of Primavera software package. | | | |
| **Textbooks and References:**   1. P. Jovanović, Upravlјanjeprojektom, 11. Izdanje, Fakultetzaprojektni i inovacioni menadžment, Beograd, 2015. 2. Ž. Vasić, M.Jevremović, D. Majkić, Upravlјanjeprojektom, praktikum, Visoka škola elektrotehnike i računarstvastrukovnihstudija, Beograd, 2015. 3. Kerzner H, Project management, 10th edition, Wiley Jersy, 2009. | | | |
| **Instruction methods:**  Lectures, problem solving sessions, laboratory exercises, assignments, consultations, preliminary exams, knowledge tests, final exam. | | | |
| **Grading (maximum number of points: 100)** | | | |
| **Preliminary activities** | **Points** | **Final Exam** | **Points** |
| Lectures activities | 5 | Written exam | 30 |
| Practical work | 15 | Oral exam |  |
| Preliminary exam(s) | 50 |  |  |
| Seminar(s) | 15 |  |  |

## Web Design

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Study program: Information Systems** | | | | | |
| **Module title:** Web Design | | | | | |
| **Lecturer:** Professor Svetlana Štrbac-Savić, PhD | | | | | |
| **Module status:** Optional | | | | | |
| **ECTS credits:** 6 | | | | | |
| **Prerequisites:** Basic computer skills and literacy. | | | | | |
| **Aims:**  This module is designed to provide necessary understandingof Web site design, development and publishing. | | | | | |
| **Learning outcomes:**  On successful completion of this module, students should be qualifiedto design, develop, publish and maintain commercial Web sites. | | | | | |
| **Module content:**  Lectures:   1. Content, technology, visual elements and efficiency in Web design. 2. Elements of good design. Similarities and differences between Web design and periodical publication design and electronic media. Developing and publishing costs. 3. Website design process. Storyboard. 4. Development and check-up of a background Web server prototype. Publishing site. 5. Conventions on the Web. Static and dynamic Web locations. 6. Web site organization. Parent page, interactive pages, descriptive pages, press-optimized pages, TLB pages, orphan pages and pages with copyright statement. 7. Navigation system. Primary and secondary navigation system. 8. Bookmark of text pages. Links. Icons and mapped images. 9. Page label. Depth meter. Graphic landmarks. 10. SEO optimization. Local browser and site map. 11. Text as the basic expression tool. System fonts and Internet fonts. 12. Multimedia environment. Colours and their meanings. Bitmap and vector images supported on the Web. 13. Animation and sound. Web-supported formats. 14. CMS Web systems. Joomla. WordPress. 15. Domain selection. Hosting service. Delivery and maintenance of web location..   Tutorial:  Designing Web site with DreamWeaver, Adobe Photoshop and Corel Draw. | | | | | |
| **Readings:**   1. P. Staletić (2015): Priručnik iz Web dizajna. VIŠER, Beograd, 2015. 2. T. Powell (2002): Web dizajn, kompletan priručnik. Mikroknjiga, Beograd, 2002. 3. C. Eccher (2008): Professional Web Design, Third Edition, Cengage Learning, 2008. | | | | | |
| **Teaching units: 75** | | | | | **Other classes** |
| Lectures: | Tutorials: | Other forms of teaching: | | Research study: |  |
| **2** | **3** |  | |  |
| **Teaching methods:**  Lectures, practical lab classes, consultation, term projects and viva. | | | | | |
| **Assessment methods (maximum number of points 100)** | | | | | |
| **Pre-exam obligations** | | | Points | **Final exam** | Points |
| Student’s engagement | | | 10 | Written exam |  |
| Practical lab-classes | | | 20 | Viva | 30 |
| Colloquia | | |  |  |  |
| Term project | | | 40 |  |  |

## Е-Commerce

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Study program: Information Systems** | | | | | |
| **Module Title:** E-commerce | | | | | |
| **Lecturer (First name, middle initial, and last name):** Professor Miroslav D. Lutovac | | | | | |
| **Module Status:**optional | | | | | |
| **ECTS credits:**6 | | | | | |
| **Prerequisites** - | | | | | |
| **Aims:** The aim of this module is to introduce students to concepts of e-trade. Offer analyticial skills on selection of hardwear and software solutions. Train students how to select methodology, set practical and executive targets and implement e-trade in practice. | | | | | |
| **Learning outcomes:** Qailify student to compile complete e-trade solutions using open-source software. | | | | | |
| **Module content:**  *Lectures:*  1. Basics of e-commerce.  2. Content management.  3. Revenue generation model selection. Selection of payment systems.  4. Selection of business model.  5. Selection of e-commerce solution.  6. Procedures for successful e-commerce.  7. Browser campaign.  8. Uploading e-commerce using open-source software.  9. Identifiying procedures for e-commerce set up.  10. Website development for the purpose of e-commerce.  11. Hardware and software for the purpose of e-commerce.  12. E-commerce architecture on the Web.  13. Safety aspects of e-commerce.  14. Electronic payment system in e-commerce.  15. Mobile systems for e-commerce.  *Tutorials:*  Design of general and executive targets and e-commerce set up. Selection of on-line trade platform. | | | | | |
| **Reading:**  1. М. Милосављевић, В. Мишковић, *Електронска трговина*, Универзитет Сингидунум, 2011  2. M. Лутовац, А. Симовић, *Приручник из Е-трговине*, ВИШЕР, Београд, издавачки план за 2012. годину  3. G. P. Schneider, *Electronic Commerce*, Course Technology, USA, 2011. | | | | | |
| **Teaching units:75** | | | | | **Other classes** |
| Lectures: | Tutorials: | Other forms of teaching: | | Research study: |  |
| 2 | 2 | 1 | |  |
| **Teaching methods:**  Lectures, lab-classes, consultations,Viva | | | | | |
| **Assessment methods (maximum number of points 100)** | | | | | |
| **Pre-exam obligations** | | | **Points** | **Final exam** | **Points** |
| Students’ engagement | | | 10 | written exam |  |
| practical lab-classes | | | 30 | Viva | 30 |
| colloquium(s) | | | 30 |  |  |
| seminar paper(s) | | |  |  |  |

## Object Oriented Design

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Study Program:** Information Systems | | | | | |
| **Module title:** Object-oriented design | | | | | |
| **Lecturer:** Professor Jelena Mitić**,** MSc | | | | | |
| **Module status:** Optional | | | | | |
| **ECTS credits:** 6 | | | | | |
| **Prerequisites:** Knowledge of basic object-oriented concepts. | | | | | |
| **Aims:**  This module is designed to provide understandingof object-oriented programming concepts and Java programming language. | | | | | |
| **Learning outcomes:**  On successful completion of this module, students should be qualified to develop object-oriented programs in Java. | | | | | |
| **Module content:**  Lectures:   1. Data and expressions. 2. Classes and objects. 3. Encapsulation. 4. Conditions and loops. 5. Arrays. 6. Inheritance. 7. Polymorphism. 8. Working with databases. 9. Exceptions. 10. Recursion, 11. Collections. 12. UML. 13. Class diagrams. 14. Activity diagrams. 15. Fundamentals of softvare designing.   Tutorial:  Tuition is in compliance to the curriculum. | | | | | |
| **Readings:**   1. Laslo Kraus (2015): Programski jezik Java sa rešenim zadacima JSE8. Akademska misao. 2. Bruce Eckel (2007): Misliti na Javi. Mikro knjiga. 3. John Lewis, William Loftus (2014): Java Software Solutions with Access Code: Foundations of Program Design. Pearson Education. | | | | | |
| **Teaching units: 75** | | | | | **Other classes** |
| Lectures: | Tutorials: | Other forms of teaching: | | Research study: |  |
| **2** | **3** |  | |  |
| **Teaching methods:**  Lectures, practical lab classes, consultation, colloquia, seminar papers and written exam. | | | | | |
| **Assessment methods (maximum number of points 100)** | | | | | |
| **Pre-exam obligations** | | | Points | **Final exam** | Points |
| Student’s engagement | | |  | Practical exam | 40 |
| Tutorials | | | 10 | Viva | 10 |
| Colloquia | | | 40 |  |  |
| Seminar paper(s) | | |  |  |  |

## Operating Systems 1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Study Program:** Information Systems | | | | | |
| **Module Title:**Оperating systems 1 | | | | | |
| **Lecturer (First name, middle initial, and last name):** Professor Borislav S. Djordjevic | | | | | |
| **Module Status:**optional | | | | | |
| **ECTS credits:**6 | | | | | |
| **Prerequisites:** None | | | | | |
| **Aims:**  The aim is to introduce students to fundamental concepts of UNIX operating system and practical introduction to Linux operating system | | | | | |
| **Learning outcomes:**  The outcome of this module is to understand most UNIX and Linux-based operating systems. Students shall be able to administer UNIX / Linux-based modern operating systems and performance optimization thereof. | | | | | |
| **Module content:**  *Lectures:*  1. Introductory lecture. Syllabus, organization and content of the module.  2. History and general features of UNIX / Linux operating system.  3. Introduction to kernel UNIX / Linux operating system.  4. Buffer cache, organization and algorithms.  5. Internal presentation of files, database systems.  6. System calls attributed to database system.  7. Structure of UNIX process, process creation mechanism  8. System calls attributed to processes.  9. Process management, process allocation, system calls.  10. Memory management under UNIX system, system calls.  11. System calls attributed to memory.  12. Input / Output System under UNIX systems.  13. Inter-process communication under UNIX systems.  14. Inter-process communications under Linux system.  15. Overall discussions. Further professional development.  *Tutorials:*  Practical lab-classes are in compliance to lectures and performed in pc-lab where students are being trained practically in elements of Linux operating system applicarion  Module is in compliance to the recommendations of EEE/ACMComputingCurriculum: CE2004 Computer Engineering Body of Knowledge: CE-OS 0-8 ,  CC2001 Computer Science Body of Knowledge: CS-OS 1-12, IT2005Information Technology Body of Knowledge: IT-PТ 1-6. | | | | | |
| **Reading:**  1. M. Bach, *The Design of the UNIX Operating System*, PrenticeHall, 1987.  2. А. Silberschatz, P. Galvin, G. Gagne, *Operating System Concepts*, JohnWiley&Sons, Inc, 2003.  3. Б. Ђорђевић, Д. Плескоњић, Н. Мачек, *Оперативни системи: теорија, пракса и решени задаци*,  Микро књига, Београд, 2005.  4. Б.Ђорђевић, М.Царић, Д.Плескоњић, Н.Мачек, *UNIX* архитектура, Висока школа електротехнике и рачунарства струковних студија, Београд, 2007.  5. Б.Ђорђевић, М.Царић, Д.Плескоњић, Н. Мачек*, Linux-системско програмирање-Приручник,* Висока школа електротехнике и рачунарства струковних студија, Београд, 2007. | | | | | |
| **Teaching units:75** | | | | | **Other classes** |
| Lectures: | Tutorials: | Other forms of teaching: | | Research study: |  |
| 3 |  | 2 | |  |
| **Teaching methods:**  Lectures, tutorials, consultations, seminar paper(s), written exam | | | | | |
| **Assessment methods (maximum number of points 100)** | | | | | |
| **Pre-exam obligations** | | | **Points** | **Final exam** | **Points** |
| Students’ engagement | | | 10 | written exam | 30 |
| Practical lab-classes | | | 10 |  |  |
| colloquium(s) | | | 30 |  |  |
| seminar paper(s) | | | 20 |  |  |

## Social Networks Analysis

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Study Program:** Information Systems | | | | | |
| **Module Title:** Social networks | | | | | |
| **Lecturer (First name, middle initial, and last name):** Professor Slobodanka S. Djenic | | | | | |
| **Module Status:** optional | | | | | |
| **ECTS credits:**6 | | | | | |
| **Prerequisites:** none | | | | | |
| **Aims:**  This module is designed to transferable skills and practical knowledge related to the scope of social networking, participative web and developing techniques | | | | | |
| **Learning outcomes:**  After successful completion of this module students should be able to use modern technologies to operate on social networks and participative web (for application and interface design) and to comprehend further development of the above mentioned. | | | | | |
| **Module content:**  *Lectures:*  1. Introductory lecture (organisation contect). Basic terms.  2. Former development of WWW. Web 2.0 and Web 3.0.  3. Social networks. Term, property and types.  4. Social network analysis.  5. Design of online communities and further development. Participation motivation.  6. Location aware social networks.  7. Social networks software  8. Web 2.0 technologies. Interactive web: *Ajax and* *API*.  9. Web 2.0 technologies: P2P, Web service, *SOA, RSS, REST, JSON*, mashup.  10. Open source movement. Open data, open content  11. Discussion and socialisation: forums, *Chat*, *IM*.publishing: blogs and *Wiki*, *Wikipedia*.  12. Digital content excange. Social labeling.  13. Recommendation system, Trust and Reputation Policy-Based Mechanisms on social networks  14. Social information processing, navigation and search. Concept of *crowdsourcing*.  15. Web based social games.  *Tutorials:*  In lab-classes: in compliance with lectures. Practical application of technologies for social networks design and mashup.  Curriculum in compliance with recommendations of IEEE/ACM Computing Curriculum:  IT2008 IT body of knowledge: WS. Social software. | | | | | |
| **Reading:**  1. R. Yee, *Pro Web 2.0 Mashups Remixing Data and Web Services*,Berkley, CA:Apress, 2008.  2. *Participative Web And User-Created Content: Web 2.0 Wikis and Social Networking*, OECD, 2007.  3. J. Porter, *Designing for the Social Web*, Berkley, CA: New Riders, 2008.  4. T. Segaran, *Programming CollectiveIntelligence*, Sebastopol, CA: O’Reilly Media, Inc, 2007. | | | | | |
| **Teaching units:75** | | | | | **Other classes** |
| Lectures: | Tutorials: | Other forms of teaching: | | Research study: |  |
| **3** | **2** |  | |  |
| **Teaching methods:**  Lectures, tutorials, seminar papers, colloquiums, and practical exam | | | | | |
| **Assessment methods (maximum number of points 100)** | | | | | |
| **Pre-exam obligations** | | | **Points** | **Final exam** | **Points** |
| Students’ engagement | | |  | written exam |  |
| Practical lab-classes (test during classes) | | | 10 | Viva |  |
| Colloquium (s) | | | 30 | PC exam | 30 |
| Seminar paper(s) | | | 30 |  |  |

## Computer Networking

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Study Program:** Information Systems | | | | |
| **Module Title:** Computer networking | | | | |
| **Lecturer (First name, middle initial, and last name):** Professor Verica M. Vasiljevic | | | | |
| **Module Status:**optional | | | | |
| **ECTS credits:**6 | | | | |
| **Prerequisites** Computer organisation and arhictecture 1 | | | | |
| **Aims:**  The aim of this module is acquiring knowledge on basic parameters influencing to speech and data transmission within communication systems arising from technologies and standards of modern computer networks. | | | | |
| **Learning outcomes:**  After successful completion of this module students should qualify to design and implement computer networks in lesser scope and complexity. | | | | |
| **Module content:**  *Lectures:*  1. Introductory lecture. Curriculum, Organization and Module content: Coherence to other modules.  2. Temporal and frequency domain, Fourier analysis, analog and digital data transmission, transmission parameters, background sound; transmission media: wiry and wireless.  3. Coding. NRZL, Manchester, AMI; ASK, FSK, PSK; modulations AM, FM, PM, range extension, FHSSDSS; frequency , time and code multiplex .  4. Gauge theorem, PCM, transmission systems T1, E1, SONET, and SDH.  5. Communication techniques, error detection, modems, xDSL technology, CDS.  6. Flow control, error control, sliding window, HDLC protocol.  7. Local area networks as per the IEEE standards: IEEE 802.1 - IEEE 802.5.  8. Wireless computer networking: the IEEE 802.11 standard; IEEE 802.15; IEEE 802.16.  9. Computer networking interconnection. Bridges, switches and commutators.  10. Network layer protocols. IPv.4 Internet protocol, addressability class, subnet design; IPv6 Internet protocol.  11. Routing in computer networks. Direct and indirect routing, distance vector algorithms, connection status, protocols RIP, OSPF, BGP.  12. Transport layer protocols: transmission control protocol - TCP, user datagram protocol - UDP.  13. Application-layer protocols. File transfer, e- mail systems, domain names, internet telephony.  14. Client server systems. Web technology, Web servers’ properties.  15. Security and data integrity. Basic features of security, encryption, protective barriers, virtual private networks, security at the transport layer.  *Tutorials:*  Performed in the PC-lab, administration of networked computers, structural cabling design. Curriculum in compliance to the recommendations of the IEEE/ACMComputingCurriculum:  CE2004 Computer Engineering Body of Knowledge: CE-NWK 0-9,  CC2008 Computer Science Body of Knowledge: CC-NC 1-4, CC-NC 7, CC-NC 9, IT2008 Information Technology Body of Knowledge: IT-NET. | | | | |
| **Reading:**  **1.** В. Васиљевић, *Рачунарске мреже*, Висока школа електротехнике и рачунарства, Београд, 2008.  **2.** В. Васиљевић, Г. Предраг, Б. Крнета, В. Илић, В. Михајловић, *Пројектовање и администрација рачунарских мрежа*, Висока школа електротехнике и рачунарства, Београд, 2011.  **3.** В. Васиљевић, Б. Павић, И. Костић, *Дигиталне телекомуникације – приручник за лабораторијске.*  *вежбе*, Висока школа електротехнике и рачунарства, Београд, 2011.  **4.** J. Kurosse, K. Ross, *Computer Networking: A Top-Down Approach*, Addison Wesley, 2009. | | | | |
| **Teaching units:75** | | | | **Other classes** |
| Lectures: | Tutorials: | Other forms of teaching: | Research study: |  |
| 2 | 2 | 1 |  |
| **Teaching methods:**  Lectures, practical project on computer networking, continuous evaluation, consultatiosn, design and public presentation of the project, final exam – PC test. | | | | |
| **Assessment methods (maximum number of points 100)** | | | | |
| **Pre-exam obligations** | | **Points** | **Final exam** | **Points** |
| Students’ engagement | | 10 | written exam |  |
| practical lab-classes | | 40 | PC test | 30 |
| colloquium(s) or quizzes тестови | | 20 |  |  |

## Business Communication

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Study Program:** Information Systems | | | | | |
| **Module Title:** Business communication | | | | | |
| **Lecturer (First name, middle initial, and last name):**Professor Lelica J. Kostic | | | | | |
| **Module Status:**optional | | | | | |
| **ECTS credits:**6 | | | | | |
| **Prerequisites** - | | | | | |
| **Aims:** The aim of this moduel to qualify students for active writing, notice and understanding of communication in daily business environment. | | | | | |
| **Learning outcomes:** After successful completion of this module, stundents should be able to design internet and external communication projects, as well as methods and types of communication via media communication channels. | | | | | |
| **Module content:**  *Lectures*  1 Definition, basic communication models and methods of business communication.  2. Basic concepts of written business communication.  3. Communication management in organizations.  4. Types and usage of written output documents in business communication.  5. Oral business communication policy. Non-verbal communication.  6. Channels of communication media.  7. Classical and interactive media communication systems.  8. Creating a communication strategy in organization.  9. The criteria and standards of internal documents.  10. Preparation and implementation of business meetings.  11. Preparation and implementation of presentation.  12. Criterion and standard of external communications.  13. Corporate communication; leadership and communication.  14. Business communication in different cultural environments.  15. Future of Business Communications - development directions.  *Practical lab-classes*  Design of written documents: offersm project documentation, projects. Oratory abilities and public speech: examples from business communication practice. Explanation of communication systems through typical and interactive media. Development of communication programmes: Creation of business strategy within organisation  Оn-lineCaseStudies: Examples of sustainable Оn-line business models part 1.  Оn-lineCaseStudies: Examples of sustainable Оn-line business models part 2. | | | | | |
| **Reading:**  1. Др Лелица Костић, *Комуникологијаса пословном комуникацијом,* уџбеник, Висока школа електротехнике и рачунарства, Београд, 2011.  2. Сем Блек, *Односи с јавношћу*, Клио, Београд, 2003. | | | | | |
| **Teaching units:75** | | | | | **Other classes** |
| Lectures: | Tutorials: | Other forms of teaching: | | Research study: |  |
| 2 | 3 |  | |  |
| **Teaching methods:**  Lectures, auditory tutorials, consultations, project, Viva. | | | | | |
| **Assessment methods (maximum number of points 100)** | | | | | |
| **Pre-exam obligations** | | | **Points** | **Final exam** | **Points** |
| Students’ engagement | | | 10 | written exam |  |
| practical lab-classes | | | 10 | Viva | 50 |
| colloquium(s) | | | 30 | Seminar paper (s) |  |

## E - Banking

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Study Program:** Information Systems | | | | | |
| **Module Title:** E-banking | | | | | |
| **Lecturer (First name, middle initial, and last name):** Branimir Trenkić, Phd | | | | | |
| **Module Status:**optional | | | | | |
| **ECTS credits:**6 | | | | | |
| **Prerequisites:** none | | | | | |
| **Aims:** The aim of this module is to acquire basic knowledge in modern e-banking necessary to service bnking organisations | | | | | |
| **Learning outcomes:** After successful completion of this module students should be able to work in banking organisations | | | | | |
| **Module content:**  *Lectures*  1. Introduction to e- banking.  2. The role and function of the central bank. Operations and balance of the central bank.  3. Organizational and institutional aspects of commercial banks.  4. Banking services of resources collection and allocation. Loan types.  5. Payment transactions. Counter operations, treasury and deposit dealings. Foreign-currency transactions and exchange dealings.  6. Bank subsidiary operations  7. First colloquium.  8. SWIFT application in banking. Implementation of information and dealing system in stock-excange e-commerce.  9. Specific features of electronic banking: dealings via debit and credit cards; dealings via ATMs.  10. Dealongs via Internet. Business via mobile telephony.  11. Risk Management in Electronic Banking.  12. Identification and analysis of risks. Operational risk: security risk.  13. Consequences of electronic cash and electronic banking.  14. Banking management banking. Strategic planning of bank development.  15. Second colloquium.  *Tutorials*  Tutorials are being held in auditory class room. During tutorials students discuss on conceret examples from practice and curriculum | | | | | |
| **Reading:**  1. Ћосић, Д., Радовановић, П., *Електронско пословање и електронско банкарство*, Београдска пословна школа, Београд, 2010.  2. Проф. др Јован Душанић: *Пословно банкарство*, Consseco Institut, Београд, 2003.  3. МрПредрагРадовановић: *Технологизацијабанкарства*, Београд, 2003. | | | | | |
| **Teaching units:75** | | | | | **Other classes** |
| Lectures: | Tutorials: | Other forms of teaching: | | Research study: |  |
| 3 | 0 | 2 | |  |
| **Teaching methods:**  Lectures, auditory classes, auditory tutorials, consultations, colloquium(s) and final exam. | | | | | |
| **Assessment methods (maximum number of points 100)** | | | | | |
| **Pre-exam obligations** | | | **Points** | **Final exam** | **Points** |
| Students’ engagement | | | 10 | written exam |  |
| practical lab-classes | | |  |  | 50 |
| colloquium(s) | | | 40 |  |  |
| seminar paper(s) | | |  |  |  |

## Information Systems Security

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Study Program:** Information Systems | | | | |
| **Module Title:** Information systems security | | | | |
| **Lecturer (First name, middle initial, and last name):** Professor Nemanja Mačel, Phd | | | | |
| **Module Status:** optional | | | | |
| **ECTS credits:** 6 | | | | |
| **Prerequisites** - | | | | |
| **Aims:**  The aim of this module is to qualify students to understand, apply and administer procedures for information security in the field of computer science, communication and other business systems. After successful completion of this module students should gain analytical and transferable skills in risk analysis, and aquires ability to give incentives to system users in policy implementation and standard procedures in system security | | | | |
| **Learning outcomes:**  Students should be qualified to apply security procedures, understand safety mechanisms and services for information security | | | | |
| **Module content:**  *Lectures*  1. Data Protection Basics (history, terminology, design, requirements explanation).  2. Security mechanisms (cryptography, authentication, redundancy, attack detection).  3. Practical application (topical practical solutions, price to quality ratio, standards).  4. Implementation policy (definition and application control, prevention, event driven occurences in the system).  5. Attacks (active, passive, malicious software, denial of service, human role in the system).  6. Application Areas (data management, network, internet, system maintenance).  7. Software and hardware solutions for data protection (comparative analysis).  8. Smart card and tokens application in the process of data protection.  9. Protection procedures of various data forms (transmission, storage and processing).  10. Security services (availability, integrity, confidentiality, non-repudiation, authenticity).  11. Hash functions and digital signature.  12. Key generation, distribution and certification authorities.  13. Required measures assessment (risk assessment and costs of protection implementation evaluation).  14. Legal determinants (international and domestic regulations, dossier managment).  *Practical lab-classes*  Analysis of basic protection systems. Symmetric protection systems. Assymetric protection systems. Security implementation systems. Hash function and digital signature. Smart card and tokens application in the process of data protection. Hardware solutions application for data protection. Cryptographic standards.  Curriculum in compliance to the recommendations of the IEEE/ACM Computing Curriculum: CC2005 Information  Technology Body of Knowledge: IT-IAS 1-6 | | | | |
| **Reading:**  1. Зоран Бањац, *Сигурност информационих система*, ВИШЕР, у поступку издавања.  2. Mark Stamp*, Information Security*, Willey, 2007.  3. A. Menezes, P. van Oorschot, and S. Vanstone*, Handbook of Applied Cryptography*, CRC Press, 2002 | | | | |
| **Teaching units:75** | | | | **Other classes** |
| Lectures: | Tutorials: | Other forms of teaching: | Research study: |  |
| 3 |  | 2 |  |
| **Teaching methods:**  Lectures, auditory and practical lab classes. | | | | |
| **Assessment methods (maximum number of points 100)** | | | | |
| **Pre-exam obligations** | | **Points** | **Final examination** | **Points** |
| Students’ engagement | |  | written exam | 50 |
| practical lab-classes | | 10 | Viva | 10 |
| colloquium(s) | | 30 |  |  |
| seminar paper(s) | |  |  |  |

## Web Applications Programming

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Study Program:** Information Systems | | | | | |
| **Module title:** Web application programming | | | | | |
| **Lecturer:** Professor Milan Gnjatović, PhD | | | | | |
| **Module status:** Optional | | | | | |
| **ECTS credits:** 6 | | | | | |
| **Prerequisites:** Basic computer skills and literacy. | | | | | |
| **Aims:**  This module is designed to provide necessary understanding of the basics of web programming and qaulifiying students to design and develop Web-oriented PHP applications. | | | | | |
| **Learning outcomes:**  On successful completion of this module, students should be qualified to develop Web-oriented applications using PHP. | | | | | |
| **Module content:**  Lectures:   1. Saving and loading data, the use of sequences. 2. Working with strings and regular expressions, writing functions. 3. Object-oriented PHP, errors and exceptions handling. 4. Desinging and developing database for the Web application. 5. Using MySQL. 6. Advanced MySQL. 7. User authentication and Web application protection. 8. Secure transactions. 9. File system and server operations using network functions and protocols. 10. Operations on dates, periods and images. 11. Session management in PHP and debugging. 12. Using PHP and MySQL for large projects. 13. Web services linking. 14. Ajax in web application design. 15. CMS basic concepts.   Tutorial:  Tuition is in compliance to the curriculum. | | | | | |
| **Readings:**   1. M. Gnjatović (2017): Uvod u pronalaženje informacija na vebu. VIŠER, Beograd. 2. L. Weilling, L. Thomson (2009): PHP i MySQL – razvoj aplikacija za Web, prevod 4. izdanja. Mikro knjiga, Beograd. | | | | | |
| **Teaching units: 75** | | | | | **Other classes** |
| Lectures: | Tutorials: | Other forms of teaching: | | Research study: |  |
| **2** | **3** |  | |  |
| **Teaching methods:**  Lectures, practical lab classes, consultation, colloquia, seminar papers and written exam. | | | | | |
| **Assessment methods (maximum number of points 100)** | | | | | |
| **Pre-exam obligations** | | | Points | **Final exam** | Points |
| Student’s engagement | | |  | Writen exam | 40 |
| Practical lab-classes | | | 10 | Viva | 10 |
| Colloquia | | | 40 |  |  |
| Seminar paper(s) | | |  |  |  |

## Business Software

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Study Program:** Information Systems | | | | | |
| **Module title:** Business Software | | | | | |
| **Lecturer:** Professor Svetlana Štrnac-Savić, Phd | | | | | |
| **Module status:** Optional | | | | | |
| **ECTS credits:** 6 | | | | | |
| **Aims**  The aim of this course is to inform students about the potentials of modern software technologies in order to improve the various aspects of e-business. | | | | | |
| **Learning outcomes:**  Upon completing this course, students will be able to: (1) demonstrate advanced knowledge of technical and business issues related to e-commerce and e-commerce; (2) write programs in VB.NET and Jscript.NET, within the ASP.NET environment; (3) work as part of a team to develop real-world business software solutions; (4) work in a virtual team environment by developing skills for a high-level business . | | | | | |
| **Module content:**  Lectures:  1. An overview of software technologies applicable in electronic commerce.  2. Software technologies that enable e-commerce applications.  3. Electronic payment systems.  4. Computer and network security.  5. Legal, ethical and social issues.  6. Web server architecture. Access to Web Servers.  7. Script programming on the client side and on the server side. ASP.NET program environment.  8. Programming ASP.NET with Jscript. Web forms in Jscript.NET.  9. HTTP cookies. ASP.NET connectivity (with file system / database).  10. ASP.NET and SQL. ASP.NET and Web Services. ASP.NET and XML.  11. Build a consumer basket using ASP.NET. PHP and MySQL.  12. Client form. Client with feedback form. Dynamic Forms in PHP.  13. Wireless Internet and mobile business. Wireless platforms and programming languages.  14. Collaborative technologies in the field of electronic business. Technologies enabled by globally distributed teams. Virtual teams.  15. Concluding considerations. Self-evaluation, case analysis  *Practical lab-classes*  Exercises are held in a computer lab. Students acquire applied knowledge and practical skills in programming applications in VB.NET and Jscript.NET, within ASP.NET environments. | | | | | |
| **Readings:**   1. Rade Stankić, „Poslovna informatika“, Ekonomski fakultet u Beogradu, ISBN 978-86-403-1209-7, 2012. 2. Harvey M. Deitel, Paul J. Deitel, Tem R. Nieto,“E-business & E-commerce: How to Program“, ISBN9780130284198, Prentice Hall, 2001. 3. Veljko Milutinovic, Frederic Patricelli, (Eds.) “MasteringE-Business Infrastructure”, 1st Edition**,**  Springer US, 2003. | | | | | |
| Lectures:2 | | Tutorials:3 | | Other forms of teaching: | |
| **Teaching methods:**  Theoretical instruction is performed by "ex catedra" using multimedia content and interactive software tools. Laboratory exercises are realized through independent or team work on a computer and is based on "learning through solving the current problem". | | | | | |
| **Assessment methods (maximum number of points 100)** | | | | | |
| **Pre-exam obligations** | Points | | Final exam | | Points |
| Student’s engagement | 5 | | Writen exam | | 40 |
| Practical lab-classes | 30 | | Viva | |  |
| Colloquia | 25 | |  | |  |
| Seminar paper(s) |  | |  | |  |

## Internet Programming

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Study Program:** Information Systems | | | | | |
| **Module title:** Internet programming | | | | | |
| **Lecturer:** Professor Boško Nikolić, PhD | | | | | |
| **Module status:** Optional | | | | | |
| **ECTS credits:** 6 | | | | | |
| **Prerequisites:** Familiarity with basic Internet application programmimg technologies. | | | | | |
| **Aims:**  This module is designed to provide necessary understandingof modern Internet applications design and development using Java programming language. | | | | | |
| **Learning outcomes:**  On successful completion of this module, students should be qualified to design and develop modern Internet applications using Jаva programming language. | | | | | |
| **Module content:**  Lectures:   1. Basic concept and terms. 2. Internet protocols. 3. Architecture of multi-layer client-server systems 4. Properties and structure of Internet applications. 5. Page description languages. XML. HTML. DOM. JavaScript. 6. Server-side scripting. 7. Web application development platform. 8. Java applications, applets. 9. Servlets. 10. Working with databases. JDBC. 11. STRUTS framework. 12. Web forms and user interraction. 13. JCF. 14. Web services. 15. Security issues: session authentication and authorization, encryption, public key infrastructure, HTTPS.   Tutorial:  Tuition is in compliance to the curriculum. | | | | | |
| **Readings:**   1. B. Nikolić (2006): Programiranje Internet aplikacija. Fakultet za poslovnu informatiku, Beograd. 2. B. Nikolić (2008): Programiranje Internet aplikacija. Beograd. | | | | | |
| **Teaching units: 75** | | | | | **Other classes** |
| Lectures: | Tutorials: | Other forms of teaching: | | Research study: |  |
| **2** | **3** |  | |  |
| **Teaching methods:** Lectures, practical lab classes, consultation, seminar papers, and written exam. | | | | | |
| **Assessment methods (maximum number of points 100)** | | | | | |
| **Pre-exam obligations** | | | Points | **Final exam** | Points |
| Student’s engagement | | |  | Written exam | 60 |
| Practical lab-classes | | | 10 | Viva |  |
| Colloquia | | |  |  |  |
| Seminar paper(s) | | | 30 |  |  |

## Internship

|  |  |  |  |
| --- | --- | --- | --- |
| **Study Program:** Information Systems | | | |
| **Course Title:** Intership | | | |
| **Course Status:** Compulsory | | | |
| **Nuber of ECTS:** 4 | | | |
| **Requirements:** None | | | |
| **Course Objectives:**  Connecting theknowledge acquiredin classwith the requirements ofpractical tasks. | | | |
| **Course Otucomes:**  Trainingfor workin institutionsand trainingfor publicoral presentation. | | | |
| **Course Content:**  *Practical instruction:*  Practical workis carried out inappropriate professionalfactories, companies and public institutions, as in organizations that provide innovative activity, as well as in car houses and modern services.  During the course, and at the end of professional practice, it is acquired to write a diary in the way of term paper and it s defended in an oral way. | | | |
| **Textbooks and References:** | | | |
| **Instruction methods:**  Lectures, problem solving sessions, laboratory exercises, consultations, colloquiums, knowledge tests, final exam. | | | |
| **Grading (maximum number of points: 100)** | | | |
| **Preliminary activities** | **Points** | **Final Exam** | **Points** |
| Lectures activities |  | Written exam |  |
| Practical work | 50 | Oral exam | 30 |
| Preliminary exams(s) |  |  |  |
| Seminar(s) | 20 |  |  |

## Internet of Things

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Study Program:** Information Systems | | | | | |
| **Lecturer: Professor** Branimir Trenkić, PhD | | | | | |
| **Module status:** Optional | | | | | |
| **ECTS credits:** 6 | | | | | |
| **Prerequisites:** | | | | | |
| **Aims**  The aim of this course is to introduce students to the hardware and software infrastructure of the Internet of intelligent devices in order to be able to develop and implement smart environments. | | | | | |
| **Learning outcomes:’**  Students will adopt theoretical foundations in the field of Internet intelligence devices along with practical knowledge in programming using appropriate technologies and devices. By taking this course, students will be able to: (a) explain in a concise manner how the Internet and also the Internet of intelligent devices work; (b) understand the limitations and capabilities of wireless and mobile networks for Internet intelligent devices. | | | | | |
| **Module content:**  **Lectures:**   1. Introduction to Internet Intelligent Devices: layers, protocols, packages, services, packet network performance parameters, 2. Introduction to Internet Intelligent Devices: applications such as the web, peer-to-peer, multimedia sensing networks. 3. Short-range communications for Internet Intelligent Devices (WiFi, Bluetooth, Zigbee, 6LowPAN). 4. M2M (Machine to Machine) and MTK (Machine Type Communication) for Internet Intelligent Devices. 5. Analysis of existing and future M2M applications. Principles of developing new applications 6. Manage resources on the Internet of intelligent devices: clustering, synchronization 7. Wireless sensor networks: architecture, technology, basic problems, development platforms. 8. Designing smart environments: smart homes, smartrooms and smart offices. 9. Smart cities. Smart Networks. 10. Smart traffic, automation of traffic signals and parking. 11. Smart eGovernment. web and mobile technologies in the automation of smart environments. 12. Application of Internet Intelligent Devices in Medicine. 13. Processing large amounts of sensor data using the BigData system. 14. From the Internet of Intelligent Devices to the Web of Intelligent Devices 15. Concluding considerations. Self-evaluation, case analysis   Practical teaching:  Exercises are held in the laboratory. Students acquire applied knowledge and practical skills on topics: (1) Linux environments and work with Raspberry Pi microcomputer. Script programming in Python in order to receive and process sensor readings; (2) Works with Arduino microcontroller and analog sensors. | | | | | |
| **Literatura**   1. Ibrahim Dogan, „Internet stvari“, Agencija EHO, ISBN: 978-86-80134-05-5, Mikro knjiga, 2015. 2. Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, **“From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence”,** 1st Edition, Academic Press, 2014. 3. 3. Francis daCosta, **“Rethinking the Internet of Things: A Scalable Approach to Connecting Everything”,** 1st Edition, Apress Publications, 2013 | | | | | |
| Lectures:2 | | Tutorials:3 | | Other forms of teaching: | |
| **Instruction methods:**  Lectures, exercises, consultations, tests, colloquia, and written exam. | | | | | |
| **Assessment methods (maximum number of points 100)** | | | | | |
| Pre-exam obligations | Points | | Final Exam | | Points |
| Student’s engagement | 5 | | Written exam | | 40 |
| Practical lab-classes | 30 | | Oral exam | |  |
| Colloquia | 25 | |  | |  |
| Seminar paper(s) |  | |  | |  |

## Programming of Mobile Devices

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Study Program:** Information Systems | | | | | |
| **Module title:** Mobile devices programming | | | | | |
| **Lecturer:** Professor Nemanja Maček, PhD | | | | | |
| **Module status:** Optional | | | | | |
| **ECTS credits:** 6 | | | | | |
| **Prerequisites:** Knowledge ofJava and XML. | | | | | |
| **Aims:**  This module is designed to provide necessary understanding of the basics of mobile application development for Android devices. | | | | | |
| **Learning outcomes:**  On successful completion of this module, students should be qualified to develop Android applications applications. | | | | | |
| **Module content:**  Lectures:   1. Introduction to Android operating system. 2. MIT App Inventor. 3. Fundamentals of Android application development: Java. 4. Fundamentals of Android application development: JSON and XML. 5. Activities, fragments and intents. 6. User interface. 7. Designing user interface with views.Дизајнирање кориснићког интерфејса применом погледа 8. Images and menus. 9. Data persistence. 10. Content providers. 11. Broadcast recievers. 12. Location based services. 13. Networking. 14. Android services development. 15. Publishing the application.   Tutorial:  Tuition is in compliance to the curriculum. | | | | | |
| **Readings:**   1. Wei-Meng Lee (2013): Android 4 razvoj aplikacija, drugo izdanje. Kompjuter biblioteka, Beograd. 2. Paul Deitel, Harvey Deitel, Alexander Wald (2016): Android 6 for Programmers: An App-Driven Approach. Deitel, 2016. 3. Derek Walter, Mark Sherman (2014): Learning MIT App Inventor: A Hands-On Guide to Building Your Own Android Apps. Addison-Wesley. | | | | | |
| **Teaching units: 75** | | | | | **Other classes** |
| Lectures: | Tutorials: | Other forms of teaching: | | Research study: |  |
| **2** | **3** |  | |  |
| **Teaching methods:**  Lectures, practical lab classes, consultation, colloquia, seminar papers and written exam. | | | | | |
| **Assessment methods (maximum number of points 100)** | | | | | |
| **Pre-exam obligations** | | | Points | **Final exam** | Points |
| Student’s engagement | | | 10 | Writen exam |  |
| Practical lab-classes | | |  | Viva | 10 |
| Colloquia | | | 40 |  |  |
| Seminar paper(s) | | | 40 |  |  |

## Data Analysis

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Study Program:** Information Systems | | | | | |
| **Module title:** Data Snslysis | | | | | |
| **Lecturer:** Jelena Mitić, Msc | | | | | |
| **Module status:** Optional | | | | | |
| **ECTS credits:** 6 | | | | | |
| **Prerequisites:** Knowledge of **basics of progrmming, databases** and computer networks | | | | | |
| **Aims**  The objective of the course is to train students to independently solve current problems in the field of data analysis. The concepts of knowledge discovery in large amounts of data are analyzed in particular. | | | | | |
| **Learning outcomes:**  After the course is over, the students will be able to independently create data analysis infrastructure using open-source software and apply tools for analysis and data processing. | | | | | |
| **Module content:**  Lectures:   1. Introductory lecture. Program, organization and content of the subject. Relation with other courses. 2. Introduction to the architecture of the data analysis system. 3. Non-erased databases. 4. Infrastructure of the data processing system. 5. Storage of large amounts of data. 6. Application types and data analysis tools. 7. Methods and algorithms for discovering knowledge in data. 8. Queries over large amounts of data. 9. Reporting systems and tools. 10. Analysis of structured and unstructured data. Review results. 11. Computer clusters. Concept and practical application. 12. Security and data integrity.*Praktična nastava*   Laboratory classes are followed by lectures, where students solve practical problems in the field of data analysis using available libraries. To train course participants for the development of complete solutions for processing and analyzing structured and unstructured data using open-source software. | | | | | |
| **Readings:**   1. D. Letić, *MathCad 13 u matematici i vizuelizaciji*, Kompjuter biblioteka, 2007. 2. B.Marr, *Big Data: Using SMART Big Data, Analytics and Metrics To Make Better Decisions and Improve Performance*, Wiley, 2015. 3. M. Despotović-Zrakić, V.Milutinović, A.Belić, *Handbook of Research on High Performance and Cloud Computing in Scientific Research and Education*, IGI Global, 2014. 4. M.Minelli, M.Chambers,A.Dhiraj, *Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today’s Businesse*s, Wiley, 2013. | | | | | |
| Lectures:2 | | Tutorials:3 | | Other forms of teaching: | |
| **Teaching methods:**  Lectures, practical lab classes, consultation, colloquia, seminar papers and written exam. | | | | | |
| **Assessment methods (maximum number of points 100)** | | | | | |
| **Pre-exam obligations** | Points | | **Final exam** | | Points |
| Student’s engagement | 10 | | Writen exam | | 30 |
| Practical lab-classes | 30 | | Viva | |  |
| Colloquia | 30 | |  | |  |
| Seminar paper(s) |  | |  | |  |

## Entrepreneurship

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Study Program:** Information Systems | | | | | |
| **Module Title:** Entrepreneurialism | | | | | |
| **Lecturer:** Professor Predrag M. Staletic | | | | | |
| **Module Status:**optional | | | | | |
| **ECTS credits:**6 | | | | | |
| **Prerequisites** - | | | | | |
| **Aims:** Acquring basic knowledge and skills in the field of entrepreneurialism. Student should gain knowledge on how to create, start up and run personal business | | | | | |
| **Learning outcomes:** After successful completion of this module students should gain enetrpreneurial skills so they could run enetreneurial businesses. | | | | | |
| **Module content:**  *Lectures*  1. The concept of entrepreneurship. Area of entrepreneurial business. Manager duties and responsabilities  2. Profile of top entrepreneur. Behavioral model. Personal responsibility. Modus vivendi and health conditions of entrepreneurs. Physical and spiritual habits.  3. Using knowledge of the others  4. Entrepreneurial knowledge and wisdom  5. Attitude towards to issues  6. Tips for success  7. Determinants of success: spirit strengthening and mental development potential  8. Vision, mission, objectives, policies, strategies and tactics of entrepreneurship  9. Alterations Management  10. Time Management  11. Quality Management  12. The art of communication  13. Methods for achieving competitive advantage  14. Human Resources management  15. Colloquium ( s)  *Tutorials*  During tutorials students discuss on concrete examples from practice and topics encompassed by curriculum. | | | | | |
| **Reading:**  1. Драгослав Јокић: *Предузетништво*, предузетнички менаџмент, Београд, 2005.  2. Стивен Кави: *Седам навика успешних људи*, друго издање, Алнан Д.о.о,Београд, 2006. | | | | | |
| **Teaching units:75** | | | | | **Other classes** |
| Lectures: | Tutorials: | Other forms of teaching: | | Research study: |  |
| 3 | 2 |  | |  |
| **Teaching methods:**  Lectures, auditory tutorials, consultations, colloquium(s) and final exam. | | | | | |
| **Assessment methods (maximum number of points 100)** | | | | | |
| **Pre-exam obligations** | | | **Points** | **Final exam** | **Points** |
| Students’ engagement | | | 10 | written exam |  |
| practical lab-classes | | |  | Viva | 50 |
| colloquium(s) | | | 40 |  |  |
| seminar paper(s) | | |  |  |  |

## Information Systems

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Study Program:** Information Systems | | | | | |
| **Module Title: Information Systems** | | | | | |
| **Lecturer:** Nemanja Maček,Phd | | | | | |
| **Module Status:**optional | | | | | |
| **ECTS credits:**6 | | | | | |
| **Prerequisites** - | | | | | |
| **Aims**  In this case, information systems will be processed in general and will explain the purpose and use of different types of information systems. | | | | | |
| **Learning outcomes**  At the end of the course, students will gain knowledge of information systems in general, as well as the use of information systems for different purposes. | | | | | |
| **Module content:**  *Lectures*   1. Introduction to information systems, what is the system, the elements and components of the system, 2. Hardware, software, application software 3. Components and classification of information systems 4. Information Systems Architecture 5. Database management systems 6. Transactional and Analytical Information Systems, Data Warehouses 7. Detection of knowledge 8. Electronic document management system 9. IS to support decision-making 10. Business information systems 11. Web as a global information system 12. Internet and web applications 13. Knowledge management systems, artificial intelligence and expert systems 14. Information systems of multimedia and virtual reality 15. Concluding considerations. Self-evaluation, case analysis   *Practical lab-classes*  Practical classes are followed by a lecture program. Exercises are held in a computer lab. Students acquire applied knowledge and practical skills in the application of W2.0 technologies in the realization of business systems and applications. | | | | | |
| **Literature**   1. R. Kelly Rainer Jr, Efraim Turban*,*“Uvod u informacione sisteme“, drugo izdanje, Mikro knjiga, ISBN: 978-86-7478-076-3, 2009. 2. Ralph M. Stair, George W. Reynolds, "Fundamentals of Information Systems", Sixth Edition, Course Technology Cengage learning, 2012. 3. Angelina Njeguš, "Poslovni informacioni sistemi", Univerzitet Singidunum, 2009 | | | | | |
| Lectures:2 | | Tutorials:3 | | Other forms of teaching: | |
| **Teaching methods:**  Lectures, practical lab classes, consultation, colloquia, seminar papers and written exam. | | | | | |
| **Assessment methods (maximum number of points 100)** | | | | | |
| **Pre-exam obligations** | poena | | **Final exam** | | poena |
| Students’ engagement | 5 | | written exam | | 40 |
| practical lab-classes | 30 | | Viva | |  |
| colloquium(s) | 25 | |  | |  |
| seminar paper(s) |  | |  | |  |

## Final Thesis

|  |  |  |  |
| --- | --- | --- | --- |
| **Study Program:** Information Systems | | | |
| **Course Title:** Final Thesis | | | |
| **Course Status:** Compulsory | | | |
| **Number of ECTS:** 12 | | | |
| **Requirements:** Passed exam,from which student has chosen for his final project | | | |
| **Course Objectives:**  The aim of the final thesis issolution and/oranalysis and presentation of theoretical and/or practical problem, with which the candidate proves that he ha sacquired theintended level of professional competence and maturity in the particular field of technology. | | | |
| **Course Outcomes:**  Acquired degree of Profesional engineer of Electrical Engineering and Computer Science. | | | |
| **Course Content:**  The process of drafting and defense of the final thesis is determined by rules of the procedure for the preparation and defense of the final thesis. The student has the right to begin production of the final thesis when he stays up to three exams that he did not pass. The student selects one of the subjects from which he passed the exam, and the subject teacher to mentor.Mentor defines a topic and a final thesis assignments, after which the candidate log the topic.  The student needs to complete the final thesis for at least three weeks and, maximum for one year from the date when he logged the topic.  During the final thesis the student has the required consultations with the supervisor.  Final thesis hould have a volume of 20 to 40 A4 pages, excluding annexes.The essential accessory is the final thesis and presentation of final thesis on are commended maximum of 20 films (slides). Technical processing of content and quality of the final thesis should be in accordance with instructions for making the final technical thesis that is an integral part of the Regulationson the procedure fort he preparation and defense of the final thesis.  Mentor confirms the satisfactory quality of contentand technical processing, with his signatureon each copy of the final thesis.  When he finishes production of the work, the student submits more scientific and educational application for approval ofthe final thesis defense, and with application he submits four copies of the final thesis. Each copy of the final thesis contain the entire text of the final thesis in electronic form (floppy or CD).  Teaching-Academic Council determines the Commission for a public oral defense of the final thesis, which consists of, president, mentor and at least one member from among the teachers.The Commission may have additional members from among the teachers of higher education institutions or other prominent experts in the field dealt with the final thesis.  Final thesisis defended orally in front of the Commission; student prepares a short presentation (15 minutes), which presents the basic assumptions of the problem and characteristics of the solution, then the Commission can ask questions and evaluate the final thesis a whole. | | | |
| **Textbooks and References:** | | | |
| **Instruction methods:**  Lectures, problem solving sessions, laboratory exercises, assignments, consultations, colloquiums, knowledge tests, final exam. | | | |
| **Grading (maximum number of points: 100)** | | | |
| **Preliminary activities** | **Points** | **Final Exam** | **Points** |
| Lectures activities |  | Written exam |  |
| Practical work |  | Oral exam |  |
| Preliminary exam(s) |  |  |  |
| Seminar(s) |  |  |  |

# REALIZATION OF PART-TIME STUDY PROGRAM INFORMATION SYSTEMS

Part-time studies are not jet recognized in Serbia. The low which will enable this kind of studies is in preparation still. In accordance with fact, this following concept of part-time studies in VIŠER is just a proposal, and it will be changed according to the low when the parliament of Republic of Serbia changes this part of low which concerns high education.

## Part-time study

|  |
| --- |
| Duration of study |
| Duration of tart-time study is twice longer then ror regular students. So, the can study for 6 years. Part-time studnents must choose subject minimum 30ECTs per year. |

|  |
| --- |
| Sustainability of the program of study |
| VISER guarantees that quality of studies for both regular and part-time students is the same. Part-time students study longer than regular but the institution (VISER) guaranties the same program for part-time studnets during their study. |

|  |
| --- |
| Quality of study |
| Part-time studnet will have the same competences as regular studnets. |

|  |
| --- |
| Method of teaching organization |
| Part-time program Information Systems will be organized as face-to-face program. The classes for part-time studnts will be organized in the same time as for regular studnets with recommandation for more flexibility for part-time studnts. |

|  |
| --- |
| Who can be part-time student? |
| Part-time studnet can be students who work, or students who have other personal reasons for choosing this study form. |

|  |
| --- |
| Enrollment and change study regime during the study |
| Enrollment requirements are the same for all studnets. Enrollment quotas for Information Systems is 80 studnets. There is no limittation of number of part-time studnets. Every studnet can choose regular or part-time type of study. Students can change study regime during the study. They can become part-time studdents or regular students depending on their choice for every scool year. |

|  |
| --- |
| Accreditation |
| Study program is unique no matter of the study regime (regular or part-time). And it must be accredited as other programmes in our institution. |

|  |
| --- |
| Financing of studies |
| Tuition feefor part-time studnets should be the same as for regular students in Information Systems program. Tuition fee is defined as numbero of ECTS multiply by cost of ome ECTS. The price of one ECTS is defined by VISER every for every school year. Student who choose part-time study must pay tuition fee. |