Department of Informatics
University of Rijeka

THE GRADUATE STUDY IN INFORMATICS

July, 2009

1 INTRODUCTION

1.1 REASONS FOR INITIATING THE STUDY

The graduate study in Informatics at the University of Rijeka trains future elementary and high school teachers. The goal of this proposition is to initiate a new graduate study in Informatics at the University of Rijeka, which would have two courses of study: Business Informatics and Information Communication Systems. This study would provide leading experts in business informatics and information-communication systems for industy and business. Since the founding of the Department of Informatics at the University of Rijeka, conditions for initiating a new graduate study have been fulfilled.

The gained knowledge and academic title would guarantee a successful career in highly specialized computer firms, as well as in business, economic and social organizations as a computer expert.
Graduates with a Master of Informatics would posses knowledge which would enable them to work in:

- computer companies,
- telecommunication companies,
- small family businesses,
- tourism and hotel industry,
- public administration agencies, local self-government agencies or public services (for example health care),
- financial institutions (for example banks),
- shipyards and industry,
- process industry,
- construction industry,
- project companies.

Students who complete the study would have the knowledge level which would enable them to work on computer science projects and develop information systems, as well as to maintain and use computer systems.

The proposed graduate study would provide a formal basis for scientific work and education in the area of information and computer science.

Informatics courses with similar contents can be found in the majority of European and American Universities under the same or similar course titles. The graduate study which would last for two years would provide expert knowledge in the area of Business Informatics and Information Communication Technology. In the first semester students would choose one of two programs. Besides general core courses, students would also be offered several elective courses. Elective courses cover the topics of: Intelligent Systems, Operational Researches, Communication Skills, Information Technology and Society, and Master's Thesis Seminar. Core courses in Business Informatics cover the topics of Program Engineering, Business Economy, Distributed Databases, Electronic Economy, Planning and Managing Information Technology Projects, Information Organization System, Strategic Planning of

Information Systems, and Logistics. The program Information and Communication Systems has the following courses: Distributed Systems, Computer Networks Management, Object-oriented Programming Languages, Multimedia and Hypermedia, Intoduction to Digital Speech and Image Processing, Human Machine Communication, System Simulation, Knowledge Mangement, Decision Support Systems, and Natural Language Processing. Each program would also provide a number of elective courses from the other program, courses from the Departments of Mathematics and Physics, or other graduate study programs at the University of Rijeka. The thesis would be written during the final semester.

1. The Business Informatics courses and Information and Communication Systems courses are in accordance with the program of the Faculty of Organization and Informatics in Varaždin, Faculty of Electrical Engineering and Computing in Zagreb, Faculty of Computer and Information Science in Ljubljana (FRI – http://www.fri.uni-lj.si), and Graz University of Technology (http://portal.tugraz.at/portal/page/portal/TU_Graz/Studium_Lehre/Studien/Informatik_Master http://portal.tugraz.at/portal/page/portal/TU_Graz/Studium_Lehre/Studien/Softwareentwicklung_mag)

1.2 PREVIOUS EXPERIENCE IN THE ORGANIZATION OF EQUIVALENT OR SIMILAR STUDIES

Since the foundation of the Department of Informatics, the conditions have been met for gathering information and computer science experts from the member institutions of the University of Rijeka. The Department of Informatics in cooperation with the Department of Mathematics has been conducting a two-course program which trains individuals to become math and informatics teachers since 1984. In the mid nineties a number of two-course programs which train future teachers were introduced at the Faculty of Philosophy in Rijeka. Informatics can nowadays be combined with Philosophy, Pedagogy, English Language and Literature, German Language and Literature, and other disciplines. We have reasonable grounds to believe that we meet all the requirements to start a new graduate study in Informatics which would provide knowledge related to business and industy. We strongly believe that the University of Rijeka needs that kind of study. One of the main reasons for proposing this study are frequent questions why there is no study in Rijeka which would train computer experts for business informatics and information communication systems.

1.3 THE STUDY'S OPENNESS TOWARDS STUDENT MOBILITY

All courses are one-semester courses and that enables dynamic content, but also enable students to participate in mobility and exchange programs at different universities (domestic and / or international) at any stage of their studies. Students who wish to participate in exchange programs have to pass all courses in which they are enrolled. Students can take the exam after completing the course.

1.4 OTHER FACTS

Informatics is very dynamic which shortens the period of time in which the equipment becomes outdated (hardware and software) and applied knowledge changes (when compared to other disciplines). That is the main reason why we modeled our study so that it allows for more flexibility in conducting programs. In accordance with that, this proposition is just an outline which will be adapted to the new trends in computer science, as well as social and economic necessities.

2 GENERAL INFORMATION

2.1 STUDY NAME

Graduate Study in Informatics

2.2 STUDY INSTITUTION

Department of Informatics
University of Rijeka
Omladinska 14,
51000 Rijeka.

2.3 STUDY LENGTH

In accordance with the Scientific Activity and High Education Act Proposition, the graduate programs in Informatics last for 2 years (4 semesters), and have 120 ECTS credits.

2.4 ADMISSION REQUIREMENTS

Applicants must hold a baccalaureate degree from one of the following institutions: a baccalaureate degree in informatics, mathematics, phisics and polytechnic from the Faculty of Philosophy in Rijeka, a baccalaureate degree from the Faculty of Organization and Informatics in Varaždin, a baccalaureate degree in mathematics and informatics from the Faculty of Science in Zagreb, or a baccalaureate degree in informatology from the Faculty of Philosophy in Zagreb.

For applicants that hold baccalaureate degree in realated field from Croatian of foregin universities the teaching council of the Department of Informatics will determine if there is a need for additional entering exam or differential courses as prerequisites terms. The additional entering exam and differential courses will not be counted as achieved ECTS credits.

There are two registration sessions, one in July and one in September.

2.5 COMPETENCES ACQUIRED BY STUDENTS UPON COMPLETION OF THE STUDY

- Master of Informatics Specialist in Business Informatics is capable of projecting and developing software and information-communication solutions for business systems, civil companies, state institutions and economic sector.
- Master of Informatics Specialist in Information Communication Systems is capable of designing, developing, and maintaining information and computer systems.
- Master of Informatics Specialist in Business Informatics is a leading expert in the field of business applications, decision support systems, information technology project management, etc.

- Master of Informatics Specialist in Information Communication Systems is a leading expert in the field of computer systems, computer networks, and information communication technology
- Master of Informatics Specialist in Information Communication Systems is capable of doing system administration and oversight activities (servers, information systems, databases).

2.6 STUDYING RHYTHM

When choosing first-year courses, graduate students also choose one of the following programs: Business Informatics or Information Communication Systems. Besides general courses, students have two courses per semester from their program, and one elective course from the other program. In the third semester students have an elective course from the graduate studies of the Departments of Mathematics and Physics or from the graduate studies at other faculties of the University of Rijeka. Students prepare their thesis in the fourth semester.

2.7 SPACE AND EQUIPMENT

At this point of time the Department of Informatics is located at the premises of the Faculty of Philosophy and it has two computer classrooms and five professors' offices. However, the construction of the premises of the University Departments in the campus is well underway and should be completed in 2009. Department of Informatics will have 30 professors' offices, 20 computer rooms with 20 seats, and 4 laboratories at its disposal. There will be 4 classrooms which will be used by the Department of Informatics and the Departments of Mathematics and Physics. Eight computer classrooms, a network lab, an information system lab, etc. are planned to be equipped with personal computers and servers.

2.8 PROFESSIONAL OR ACADEMIC DEGREE OBTAINED UPON COMPLETION OF THE STUDY

Master of Informatics Specialist in Business Informatics
Master of Informatics Specialist in Information Communication Systems

3 CURRICULUM

3.1 TABLE OF CORE AND ELECTIVE COURSES OR PROGRAMS

Year (semester)	Course Title	ECTS Credits	Hours / week	Core / Elective
4 (VII)	Intelligent Systems 1	6	4	C
4 (VII)	Operations Research 1	6	4	C
	Program BI			
4 (VII)	Software Engineering	6	4	C
4 (VII)	Business Economics	6	4	C
4 (VII)	Elective Course (ICS program)	6	4	E
	Program ICS			
4 (VII)	Distributed Systems	6	4	C
4 (VII)	Object-Oriented Programming Languages	6	4	C
4 (VII)	Elective Course (BI program)	6	4	E
4 (VIII)	Intelligent Systems 2	6	4	C
4 (VIII)	Operations Research 2	6	4	C
	Program BI			
4 (VIII)	Selected Topics in Databases	6	4	C
4 (VIII)	Electronic Commerce	6	4	C
4 (VIII)	Elective Course (ICS program)	6	4	E
	Program ICS			
4 (VIII)	Multimedia and Hypermedia Systems	6	4	C
4 (VIII)	Intoduction to Digital Speech and Image Processing	6	4	C
4 (VIII)	Elective Course (BI program)	6	4	E
	Total	**60**		
5(IX)	Communication Skills	2	2	C
5(IX)	Master's Thesis Seminar	4	2	C
	Program BI			
5(IX)	Management	6	4	C
5(IX)	Information Technology Project Management OR * Organization's Information System	6	4	C
5(IX)	Elective Course (ICS program)	6	4	E
5(IX)	Elective Course	6	4	E
	Program ICS			
5(IX)	Network Systems Management	6	4	C
5(IX)	Human-Machine Communication	6	4	C
5(IX)	Knowledge Discovery and Data Mining OR Knowledge Management	6	4	E

5(IX)	Elective Course	6	4	E
5(X)	Information Technology and Society	5	4	C
5(X)	Thesis	10		C
	Program BI			
5(X)	Strategic Planning of Information Systems	5	4	C
5(X)	Logistics	5	4	C
5(X)	Elective Course (ICS program) OR * Elective Course (EF, TF, MF)	5	4	E
5(X)	Program ICS			
5(X)	Decision Support Systems	5	4	C
5(X)	Natural Language Processing OR * e-learning	5	4	C
5(X)	Elective Course (BI program) OR Elective Course (EF, TF, PF)	5	4	E
0	**Total**	**60**		
Total credits		**120**		

* Students choose one of two electives.

3.2 OPTIMAL NUMBER OF STUDENTS

The optimal number of students to be enrolled in each graduate program with respect to space, equipment, and staff is twenty per module**.**

3.3 TUITION

Tuition is estimated at 16 115.75 HRK per student. It is calculated based on the assumption that each study program requires at least eight faculty members (docents or higher). The calculation is given below:

In two years time (graduate program in informatics):
5.4 (the number of faculty members) x 1.90= 10.26 x 4414.42 = 45291.95 x 1.15 = 52085.75 x 12 = 625029.00 x 1172 = 732533.99 x 1.10 = 805787.39 / 50 = **HRK 16 115.75 per student.**

3.4 EVALUATION

Quality tracking and efficiency measuring of the proposed graduate programs in informatics will be in accordance with the Ordinance on Standards and Criteria for Evaluation of Quality and Efficiency of Higher Education Institutions and Study Programs (NN 9/05). A special

attention will be paid to the methods regulated in Article 4, paragraph 7 which refer to the internal mechanisms of quality assurance at higher education institutions.

While performing the proposed study, a continuous self-evaluation will be conducted based on the results obtained from:

- anonymous questionnaires filled in by the students at the end of each semester for each course and the study as a whole
- analysis of the results of the exams taken in the winter, summer, and autumn exam sessions
- analysis of the enrollment numbers (the ratio between regular, conditional and repeat enrollments)
- contacting graduates some time after graduation to determine if there are any work-market problems which could be solved and for which students could be better prepared while studying.

The self-evaluation methods will determine if there are any problems causing low quality, inefficient or extended studying, and the source of these problems will be determined. We will consult students and take all the necessary steps in order to eliminate problems.

Furthermore, with the goal of raising the quality of study, professors will attend specialization courses, and an annual internal evaluation of professors will be conducted.

In order to increase the quality and quantity of literature at students' disposal, professors will be encouraged to publicize and they will be given a financial support in accordance with the possibilities of the Department of Informatics at the University of Rijeka.

4 COURSES DESCRIPTION

4.1 I. YEAR OF STUDY

Basic description		
Course coordinator	**Ana Meštrović**	
Course title	INTELLIGENT SYSTEMS I	
Study programme	INFORMATICS	
Course status	compulsory	
Year	I	
ECTS credits and teaching	ECTS student 's workload coefficient	6
	Number of hours (L+E+S)	**30+30+0**

1. COURSE DESCRIPTION

1.1. Course objectives

This module provides a general introduction to artificial intelligence and its techniques.
An overview on the main sub-fields of artificial intelligence will be given. The main focus of the module will be on the common underlying ideas, such as knowledge representation, search, rule based systems, and learning.
The aims of this module are to:

- Give the student an understanding of the various formalisms and concepts underlying intelligent systems.
- Enable the student to apply those formalisms in the context of more complex systems.
- Allow the student to understand the functional and logic programming paradigms and be able to state solutions to simple problems using these paradigms.

1.2. Course enrolment requirements

Course program is in correlation with courses Intelligent systems II and Knowledge discovery and Data mining.

1.3. Expected course learning outcomes

On completion of this module, the student should be able to:

1. Structure the field of artificial intelligence into its main subfields, and outline the important features of AI systems
2. Apply simple search algorithms
3. Explain why particular search techniques may or may not be suitable in a given situation.
4. Explain the differences between various knowledge representation techniques.
5. Develop simple working programs using functional and logic programming languages.

1.4. Course content

History and philosophical foundations.
Propositional and first-order predicate logic: syntax and semantics, inference rules, unification and pattern-matching.
Problem-solving as a search procedure: state space search, fundamentals of graph theory, search strategies: forward and backward-chaining, backtracking.

Uninformed graph-search algorithms: depth-first, breadth-first.
Heuristic graph-search algorithms: hill-climbing, best-first search, determining suitable heuristics.
Game-playing or competitive graph-search algorithms: MINIMAX, Alpha-Beta pruning.
Higher-level search techniques: recursive search, pattern-directed search.
Knowledge representation techniques: logical, procedural, network, structured.
Requirements for knowledge representation techniques.
Overview of functional and logic programming paradigms.

1.5. Teaching methods	☒ lectures ☒ seminars and workshops ☐ exercises ☐ long distance education ☐ fieldwork	☒ individual assignment ☐ multimedia and network ☒ laboratories ☐ mentorship ☐ other
1.6. Comments		

1.7. Student's obligations

Students are expected to:
- attend classes regularly
- make necessary preparations for classes
- do practical work
- present project
- pass the exam.

1.8. Evaluation of student's work

Course attendance	1	Activity/Participation	1	Seminar paper	1	Experimental work	
Written exam	1	Oral exam		Essay		Research	
Project	1	Sustained knowledge check		Report		Practice	1
Portfolio							

1.9. Assessment and evaluation of student's work during classes and on final exam

1.10. Assigned reading (at the time of the submission of study programme proposal)

- G.F. Luger: *Artificial Intelligence: Structures and Strategies for Complex Problem Solving*, Addison-Wesley, 2005.
- Russell, S., Norvig, P., *Artificial Intelligence: A Modern Approach*, Prentice Hall, 2003.

1.11. Optional / additional reading (at the time of proposing study programme)

M. Negnevitsky, Artificial Intelligence: A Guide to Intelligent Systems, Addison Wesley, 2005.
I. Bratko, Prolog Programming for Artificial Intelligence, Addison Wesley, 2000

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

Title	*Number of copies*	*Number of students*

1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Quality of the course will be monitored and measured through the success of examinations and through the anonymous inquiry reflecting students opinions regarding the course.

Basic description		
Course coordinator	**Marja Marinović**	
Course title	OPERATIONS RESEARCH 1	
Study programme	INFORMATICS	
Course status	compulsory	
Year	I	
ECTS credits and teaching	ECTS student 's workload coefficient	6
	Number of hours (L+E+S)	30+30+0

1. COURSE DESCRIPTION

1.1. Course objectives

The objective of the course is to teach students basic concepts, results and methods of the operations research and train them to implement the acquired knowledge.

1.2. Course enrolment requirements

Operations research correlates with mathematics courses of the study.

1.3. Expected course learning outcomes

After completing the course and meeting requirements, students are expected to be capable of:
1. Correctly explain and analyze basic concept of operations research, first of all, linear and dynamic programming.
2. Analyze and adequately implement mathematical models of linear and dynamic programming.
3. Correctly explain and analyze special problems, for example, optimality principle.

1.4. Course content

Concept and development of operations research. Procedure for solving operations research problems. Convex sets and linear inequalities
Linear programming. Problem definition in linear programming. Setting a mathematical model for linear programming. Graphical method for solving problems in linear programming. Solving linear programming problems using simplex method. Dual problems. Analysis of the optimal solution.
Dynamic programming. Mathematical definitions of basic concepts. Optimality principle. Simple distribution problem. Complex distribution problem.

1.5. Teaching methods	☒ lectures ☐ seminars and workshops ☒ exercises ☐ long distance education ☐ fieldwork	☒ individual assignment ☐ multimedia and network ☐ laboratories ☐ mentorship ☒ other- consultations
1.6. Comments	During the semester, a student obtains required number of ECTS credits through regular attendance and active participation in all forms of lectures, completion of tasks assigned and elaboration of particular topic.	

1.7. Student's obligations

1.8. Evaluation of student's work

Course attendance	1	Activity/Participation	1	Seminar paper		Experimental	

						work	
Written exam	1	Oral exam	1	Essay		Research	1
Project		Sustained knowledge check	1	Report		Practice	
Portfolio							

1.9. Assessment and evaluation of student's work during classes and on final exam

1.10. Assigned reading (at the time of the submission of study programme proposal)

D. Barković, Operacijska istraživanja, Sveučilište Josipa Jurja Strossmayera u Osijeku, Ekonomski fakultet, Osijek, 2001.
D. Kalpić, V. Mornar, *Operacijska istraživanja*, Zeus, Zagreb, 1996.

1.11. Optional / additional reading (at the time of proposing study programme)

F.S. Hillier, G.J. Lieberman, *Introduction to Operations Research*, 3rd edition, Holden Day, 1980.
R.C. Larson, A.R. Odoni, *Urban operations research*, Prentice Hall, N J, 1981.

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

Title	*Number of copies*	*Number of students*

1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Periodical evaluation and assessment of students and teachers is foreseen in order to provide continuous improvement of teaching quality. During the last week of classes, a poll will be conducted, where students would evaluate the quality of classes. Students' achievements will be analyzed.

Basic description		
Course coordinator	**Maja Matetić**	
Course title	INTELLIGENT SYSTEMS II	
Study programme	*INFORMATICS*	
Course status	compulsory	
Year	I	
ECTS credits and teaching	ECTS student 's workload coefficient	6
	Number of hours (L+E+S)	**30+30+0**

1. COURSE DESCRIPTION

1.1. Course objectives

This course builds on the introduction to intelligent systems given in the Intelligent Systems 1 course, by presenting a range of applications for intelligent systems which use the basic concepts presented in the previous course.
The course presents current methodologies and techniques of expert systems in detail. This course looks at knowledge representation and inference, problem solving and designing expert systems for a variety of applications. The course will concentrate on underlying principles illustrated by examples drawn from well known expert systems.

The aims of this module are to:

- Give the student an understanding and appreciation of the various domains in which intelligent systems can be and are used for practical purposes.
- Enable the student to analyse situations to see where systems using artificial intelligence techniques may or may not be usefully employed to solve real-world problems, and to discuss the strengths and weaknesses of AI solutions in these areas.

Allow students to examine and implement the development process for a simple expert system application.

1.2. Course enrolment requirements

Course program is in correlation with courses Intelligent systems 1 and Knowledge discovery and Data mining.

1.3. Expected course learning outcomes

On successful completion of this module the student should be able to:

- implement methods of inference and reasoning
- demonstrate an understanding of the areas where intelligent systems offer advantages to businesses and other categories of potential users.
- examine and critique potential applications for intelligent systems.

develop a simple application using an expert system shell.

1.4. Course content

Concept and development of operations research. Procedure for solving operations research problems. Convex sets and linear inequalities
Linear programming. Problem definition in linear programming. Setting a mathematical model for linear programming. Graphical method for solving problems in linear programming. Solving linear programming problems using simplex method. Dual problems. Analysis of the optimal solution.
Dynamic programming. Mathematical definitions of basic concepts. Optimality principle. Simple distribution problem. Complex distribution problem.

1.5. Teaching methods	☒ lectures ☒ seminars and workshops ☐ exercises ☐ long distance education ☐ fieldwork	☒ individual assignment ☐ multimedia and network ☒ laboratories ☐ mentorship ☐ other
1.6. Comments	**Laboratory work will be done in a computer laboratory.**	

1.7. Student's obligations

Students are expected to:

- attend classes regularly
- make necessary preparations for classes
- do practical work
- present project
- pass the exam.

1.8. Evaluation of student's work

Course attendance	1	Activity/Participation	1	Seminar paper		Experimental work	
Written exam	1	Oral exam		Essay		Research	
Project	1	Sustained knowledge check		Report	1	Practice	1
Portfolio							

1.9. Assessment and evaluation of student's work during classes and on final exam

1.10. Assigned reading (at the time of the submission of study programme proposal)

G.F. Luger: *Artificial Intelligence: Structures and Strategies for Complex Problem Solving*, Addison-Wesley, 2005.
Russell, S., Norvig, P., *Artificial Intelligence: A Modern Approach*, Prentice Hall, 2003.

1.11. Optional / additional reading (at the time of proposing study programme)

1. M. Negnevitsky, Artificial Intelligence: A Guide to Intelligent Systems, addison Wesley, 2005.
2. J. Giarratano and G. Riley, Expert Systems - Principles and Programming, PWS Publishing, Boston, MA, 2004.
3. P. Jackson, Introduction to Expert Systems,Addison-Wesley, 1999
4. I. Bratko, Prolog Programming for Artificial Intelligence, Addison Wesley, 2000

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

Title	*Number of copies*	*Number of students*

1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Quality of the course will be monitored and measured through the success of examinations and through the anonymous inquiry reflecting students opinions regarding the course.

Basic description		
Course coordinator	**Marija Marinović**	
Course title	OPERATIONS RESEARCH 2	
Study programme	INFORMATICS	
Course status	compulsory	
Year	I	
ECTS credits and teaching	ECTS student 's workload coefficient	6
	Number of hours (L+E+S)	30+30+0

1. COURSE DESCRIPTION

1.1. Course objectives

The objective of the course is to teach students basic concepts, results and methods of the operations research and train them to implement the acquired knowledge.

1.2. Course enrolment requirements

Operations research correlates with Operations research 1 and mathematics courses of the study.

1.3. Expected course learning outcomes

After completing the course and meeting requirements, students are expected to be capable of:
1. Correctly explain and analyze basic concept of operations research, first of all, queuing theory, networks and Markov's chains.
2. Analyze and adequately implement the queuing theory, networks and Markov's chains.
3. Correctly explain and analyze special problems that may occur.

1.4. Course content

Queuing theory. Main characteristics of queuing problems. Classification of queuing problems. Single-server and multiserver queuing system. Function of costs in queuing system.
Analysis of networks. Basic concepts in graph theory. Maximal throughput problem. Shortest path problem. Longest path problem.
Introduction to network planning: CPM and PERTH.
Problems in equipment procurement and replacement.
Discrete random processes. Markov's chains and application.

1.5. Teaching methods	☒ lectures ☐ seminars and workshops ☒ exercises ☐ long distance education ☐ fieldwork	☒ individual assignment ☐ multimedia and network ☐ laboratories ☐ mentorship ☒ other - consultation
1.6. Comments	During the semester, a student obtains required number of ECTS credits through regular attendance and active participation in all forms of lectures, completion of tasks assigned and elaboration of particular topic.	

1.7. Student's obligations

Regular class attendance and active participation in learning process, completion of certain number of tasks in respect to lectures and exercises. Student is supposed to pass written exam in respect to exercises as a precondition for taking the oral exam, where students' complete knowledge is evaluated and assessed.

1.8. Evaluation of student's work

Course attendance	1	Activity/Participation	1	Seminar paper	1	Experimental work	
Written exam	1	Oral exam	1	Essay		Research	
Project		Sustained knowledge check	1	Report		Practice	
Portfolio							

1.9. Assessment and evaluation of student's work during classes and on final exam

1.10. Assigned reading (at the time of the submission of study programme proposal)

D. Barković, Operacijska istraživanja, Sveučilište Josipa Jurja Strossmayera u Osijeku, Ekonomski fakultet, Osijek, 2001.
D. Kalpić, V. Mornar, *Operacijska istraživanja*, Zeus, Zagreb, 1996.
Ž. Pauše, *Vjerojatnost. Informacija. Stohastički proces*, Školska knjiga, Zagreb, 1974

1.11. Optional / additional reading (at the time of proposing study programme)

F.S. Hillier, G.J. Lieberman, *Introduction to Operations Research*, 3rd edition, Holden Day, 1980.
R.C. Larson, A.R. Odoni, *Urban operations research*, Prentice Hall, N J, 1981.

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

Title	*Number of copies*	*Number of students*

1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Periodical evaluation and assessment of students and teachers is foreseen in order to provide continuous improvement of teaching quality. During the last week of classes, a poll will be conducted, where students would evaluate the quality of classes. Students' achievements will be analyzed.

Basic description		
Course coordinator	**Mile Pavlić**	
Course title	SOFTWARE ENGINEERING	
Study programme	INFORMATICS	
Course status	compulsory	
Year	I	
ECTS credits and teaching	ECTS student 's workload coefficient	6
	Number of hours (L+E+S)	30+30+0

1. COURSE DESCRIPTION

1.1. Course objectives

The goal of the course is to give students an overview of the field of software engineering. The students are presented with a few successful real-life software team development examples taking into consideration various temporal, financial and other limitations. The students learn how to build an application on the basis of the project.

1.2. Course enrolment requirements

The course program is in correlation with the following courses: Data modelling, Process modelling, Software Engineering, Information systems and Organization's Information Systems

1.3. Expected course learning outcomes

After finishing the course, the students will be able to:
- design a data model and process model and build the application in a programming language they are familiar with

1.4. Course content

Software engineering as a discipline. Science and engineering. Research, development and production. Education and certification. Norms. Profession ethics. Software engineering methodology. Approaches to application development. Application life cycle. Application development phases. Methods and techniques. Analysis. Models. Data and process modelling. Interviews. Documentation analysis. Requirements engineering. Managing requests. Application architecture. Design. User interface, application documentation and user guides. Costs, resources. Priorities. RAD tools. Application reengineering. Planning and managing the development teams.

1.5. Teaching methods	☒ lectures ☐ seminars and workshops ☒ exercises ☐ long distance education ☐ fieldwork	☒ individual assignment ☐ multimedia and network ☐ laboratories ☐ mentorship ☒ other - consultation

1.6. Comments	In collaboration with their mentor, the students will design a project and build the software.

1.7. Student's obligations

The students are obliged to actively participate in all forms of activities; they have to design a data model and a process model of a business system part of their choice. Moreover, they have to build and present an application using a programming language of their choice.

1.8. Evaluation of student's work

Course attendance	1	Activity/Participation	1	Seminar paper	3	Experimental work	
Written exam		Oral exam		Essay		Research	
Project		Sustained knowledge check	1	Report		Practice	
Portfolio							

1.9. Assessment and evaluation of student's work during classes and on final exam

1.10. Assigned reading (at the time of the submission of study programme proposal)

Sommerville, I.: Software Engineering, 8th Edition, Addison-Wesley, Harlow, 2007.
Humphrey, W.S., Introduction to the Team Software Process. Addison-Wesley, 2000.

1.11. Optional / additional reading (at the time of proposing study programme)

McCullough.Dieter, C., Prem, J., Chandak, R., Chandak, P.: Oracle8 biblija, Znak, Zagreb, 1998.
Strahonja, V., Varga, M., Pavlić, M., (1992) Projektiranje informacijskih sustava, HIZ i INA-Info

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

Title	*Number of copies*	*Number of students*

1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

During the last week of the course the students will be presented with an anonymous survey which will serve to measure the course quality. Also, there will be an exam success analysis.

Basic description		
Course coordinator	**Ante Bistričić**	
Course title	BUSINESS ECONOMICS	
Study programme	**INFORMATICS**	
Course status	compulsory	
Year	I	
ECTS credits and teaching	ECTS student 's workload coefficient	6
	Number of hours (L+E+S)	**30+30+0**

1. COURSE DESCRIPTION

1.1. Course objectives

Presention of the market economy basic business categories and company basic economic problems. The idea of the course is to enable students to acquire the basic knowledge necessary for their easier understanding of particular business and organization related courses in further studies.

1.2. Course enrolment requirements

This course is correspondent with Management.

1.3. Expected course learning outcomes

Students are expected to learn the basic elements of the entrepreneurship economics: Calculations. Measuring the business results. Business efficiency, productivity, economy, rent ability.. Cost models. Cost optimization. Indexes in economics and financial performance. Productivity, Economy and Rentability.

1.4. Course content

Entrepreneurship economic eaning Entrepreneurship in economic theory,
Calculations. Measuring the business results. Business efficiency, productivity, economy, rent ability.Cost. Definition and types. Cost models. Cost optimization. Indexes in economics and financial performance. Productivity, Economy and Rentability. European and global entrepreneurship Enterprise and entrepreneurship Company growth and development Mutual dependence of entrepreneurship and management Mutual dependence of innovativeness and entrepreneurship Ethics and business success Business culture Methodology, forecast, financial and economical measuring, types of development plans.

1.5. Teaching methods	☒ lectures ☐ seminars and workshops ☒ exercises ☐ long distance education ☐ fieldwork	☒ individual assignment ☐ multimedia and network ☐ laboratories ☐ mentorship ☒ other - consultation

1.6. Comments — *I*

1.7. Student's obligations

Students must be active and participate in class activities.

1.8. Evaluation of student's work

Course attendance	1	Activity/Participation	1	Seminar paper	2	Experimental work	
Written exam	1	Oral exam		Essay		Research	

Project		Sustained knowledge check	1	Report		Practice	
Portfolio							

1.9. Assessment and evaluation of student's work during classes and on final exam

1.10. Assigned reading (at the time of the submission of study programme proposal)

Hauc A.: Organiziranje projekata, Informator, Zagreb, 1982,
Novak M. Popović Ž.: Razvojna politika, Informator, Zagreb 1976.

1.11. Optional / additional reading (at the time of proposing study programme)

Bendeković J.i koautori: Planiranje investicijskih projekata (knjiga I, II, III, IV), Ekonomski inmstitut, Zagreb, 1993,
Nušinović M.: Planiranje investicijskih projekata u funkciji optimalizacije društveno- ekonomskog razvoja, Ekonomski institut, Zagreb, 1989,
Belak J. i drugi: Podjetništvo, politika podjetja i management, Založba obzorja, Maribor, 1993,
Hauc A.: Projektni management, GV Založba, Ljubljana, 2002.
Certo S.C.: Modern management; Edvard Elgers, and the Global Enviroment. Allyn and Bacon, boston, 1992,

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

Title	*Number of copies*	*Number of students*

1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Periodical evaluation and assessment of students and teachers is foreseen in order to provide continuous improvement of teaching quality. During the last week of classes, a poll will be conducted, where students would evaluate the quality of classes. Students' achievements will be analyzed.

Basic description		
Course coordinator	**Božidar Kovačić**	
Course title	DISTRIBUTED SYSTEMS	
Study programme	**INFORMATICS**	
Course status	compulsory	
Year	I	
ECTS credits and teaching	ECTS student 's workload coefficient	6
	Number of hours (L+E+S)	**30+30+0**

1. COURSE DESCRIPTION

1.1. Course objectives

introduce students with basic concept in Distributed systems
acceptance knowledge about basic concept of Distributed system: communication and synchronization, data management, protection

1.2. Course enrolment requirements

The course correlates with other computer architecture courses and computer network courses.

1.3. Expected course learning outcomes

After completing the course and meeting requirements, students are expected to be capable of:
understand structure and principles of work for distributed system
Adopt knowledge included in "Course content".

1.4. Course content

Parallel systems: synchronization and communication
Distributed systems: message passing, remote procedure call
Naming in Distributed Systems
Data management in Distributed Operating systems: files and directories, file system implementation
Recovery form failure
Introduction in real time systems
Security and protection in distributed system

1.5. Teaching methods	☒ lectures ☐ seminars and workshops ☒ exercises ☐ long distance education ☐ fieldwork	☐ individual assignment ☐ multimedia and network ☐ laboratories ☐ mentorship ☐ other
1.6. Comments	During the semester, a student obtains required number of ECTS credits through regular attendance and active participation in all forms of lectures, completion of tasks assigned and elaboration of particular topic.	

1.7. Student's obligations

Regular class attendance and active participation in learning process. Student is supposed to pass written exam in respect to exercises as a precondition for taking the oral exam, where students' complete knowledge is evaluated and assessed.

1.8. Evaluation of student's work

Course attendance	1	Activity/Participation	1	Seminar paper		Experimental work	
Written exam	2	Oral exam	2	Essay		Research	
Project		Sustained knowledge check		Report		Practice	
Portfolio							

1.9. Assessment and evaluation of student's work during classes and on final exam

1.10. Assigned reading (at the time of the submission of study programme proposal)

Tanenbaum A., Woodhull A., *Modern Operating systems, Desing & Implementation*, Prentice Hall, 1997.
Tanenbaum A., Woodhull A., *Operating systems, Desing & Implementation*, Prentice Hall, 1997.

1.11. Optional / additional reading (at the time of proposing study programme)

Stalling S., *Operating systems*, Macmillan, 1992
Silberschatz A., Galvin P. B., *Operating system concepts*, Addison Wesley, 1989.

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

Title	*Number of copies*	*Number of students*

1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Periodical evaluation and assessment of students and teachers is foreseen in order to provide continuous improvement of teaching quality. During the last week of classes, a poll will be conducted, where students would evaluate the quality of classes. Students' achievements will be analyzed.

Basic description		
Course coordinator	**Mario Radovan**	
Course title	OBJECT ORIENTED PROGRAMMING LANGUAGES	
Study programme	INFORMATICS	
Course status	compulsory	
Year	I	
ECTS credits and teaching	ECTS student 's workload coefficient	6
	Number of hours (L+E+S)	**30+30+0**

1. COURSE DESCRIPTION

1.1. Course objectives

The aim of this course is to introduce students into the methods, possibilities and aims of programming in the object-oriented programming language Java. In the course is presented the knowledge which is required for developing independent applicative programs of various kinds, and especially for the development of the interactive network application with the use of the Java applets and servlets.

1.2. Course enrolment requirements

The content of this course draws on those informatics courses which deal with programming and with data bases; the course explicitly uses and extends the knowledge presented in the courses which deal with the computer networks and with the programming for the Internet.

1.3. Expected course learning outcomes

Students are expected to acquire the basic knowledge of the principles and possibilities of programming in the object-oriented programming language Java, as specified in the "Course content" below. Students must especially get acquainted with the ways of developing and with the possibilities of using applets and servlets, so that they become able to develop interactive web applications.

1.4. Course content

The programming language Java: standard applications, applets and servlets. Platform independence and code mobility (bytecode). Basic elements of the language Java: data types, variables, expressions, operators; controlling the flow of processes and data: conditions and loops. Structural features of the language Java.

Classes, constructors, and methods. Creating and shaping classes, methods and objects in Java. Using system classes and methods; inheritance and overriding; importing classes and packets. Exceptions: types of exceptions and exception handling. Data flow and work with files; input and output data flows: definitions and the ways of use.

Creating applets: the life cycle and the use of applets. Creating communication interfaces. Interactive communication: textual fields and arrays, selection lists, buttons. Shaping graphical interfaces. Events handling and mouse operation. Programming threads and multi-thread programming. The program threads and applets. Animation.

Servlets: principles and methods of their development. The life cycle of servlets. The aims and possibilities of using servlets. Applets, servlets, and interactive web applications. Security and protection: scopes and ways of protection; controlling the operations of applets and servlets.

1.5. Teaching methods	☒ lectures ☐ seminars and workshops ☒ exercises ☐ long distance education	☒ individual assignment ☐ multimedia and network ☐ laboratories ☐ mentorship

	☐ fieldwork	☒other - consultation

1.6. Comments	/

1.7. Student's obligations

It is compulsory for students to attend exercises. A student has to pass the written (practical) part of the examination which regards the exercises, as the precondition to take the oral part of examination where the complete knowledge of the student is examined and evaluated.

1.8. Evaluation of student's work

Course attendance	1	Activity/Participation	0,5	Seminar paper		Experimental work	
Written exam	2	Oral exam	1,5	Essay		Research	
Project		Sustained knowledge check	0,5	Report		Practice	0,5
Portfolio							

1.9. Assessment and evaluation of student's work during classes and on final exam

1.10. Assigned reading (at the time of the submission of study programme proposal)

Eckel, B.: *Thinking in Java 3rd Edition*, Prentice Hall, 2003.
Arnold, K., Gosling, J., Holmes, D.: *The Java(TM) Programming Language (3rd Edition)*, Addison-Wesley Professional, 2000.
Bergsten, H.: *Java Server Pages*, O'Reilly & Associates, 2000.

1.11. Optional / additional reading (at the time of proposing study programme)

Lemay, L., Cadenhead, R.: *Sams Teach Yourself Java 2 in 21 Days, Professional Reference Edition*, Sams, 2001.
Campione, M., Walrath, K., Huml, A.: *The Java(TM) Tutorial: A Short Course on the Basics (3rd Edition)*, Addison-Wesley Professional, 2000.

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

Title	*Number of copies*	*Number of students*

1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Periodical evaluation and assessment of students and teachers is foreseen in order to provide continuous improvement of teaching quality. During the last week of classes, a poll will be conducted, where students would evaluate the quality of classes. Students' achievements will be analyzed.

Basic description		
Course coordinator	**Patrizia Poščić**	
Course title	SELECTED TOPICS IN DATABASES	
Study programme	INFORMATICS	
Course status	compulsory	
Year	I	
ECTS credits and teaching	ECTS student 's workload coefficient	6
	Number of hours (L+E+S)	**30+30+0**

1. COURSE DESCRIPTION

1.1. Course objectives

The objective of this course is to qualify students for advanced design, development and managing of databases and data warehouse.

1.2. Course enrolment requirements

Course program is in correlation with courses Introduction to Databases, Databases, Data Modeling, Information systems and Decision Support Systems.

1.3. Expected course learning outcomes

On completion of this course the student should be able to:
Describe and define concepts of Object and Object-relational databases
Define and explain advantages and disadvantages of distributed databases
Explain data warehousing implementation and administration
Use state-of-the-art, current database technology

1.4. Course content

Object oriented data model, object-relational oriented data model. Object-relational and object oriented databases. Using UML in database design. Distributed databases.
DBMS: distributed and object-oriented database management systems.
Data warehouses: extraction, transform and load process. Data warehouse administration and performance tuning. Agregation and indexing.
Special purpose databases: temporal databases, active databases, multimedia databases

1.5. Teaching methods		
	☒ lectures	☒ individual assignment
	☐ seminars and workshops	☐ multimedia and network
	☒ exercises	☐ laboratories
	☐ long distance education	☐ mentorship
	☐ fieldwork	☒ other - consultation

1.6. Comments — */*

1.7. Student's obligations

Students are expected to:
attend classes regularly
actively participate in all forms of works
do practical work
pass the exam.

1.8. Evaluation of student's work

Course attendance	1	Activity/Participation	0,5	Seminar paper	1	Experimental work	
Written exam	1,5	Oral exam	1,5	Essay		Research	
Project		Sustained knowledge check	0,5	Report		Practice	
Portfolio							

1.9. Assessment and evaluation of student's work during classes and on final exam

1.10. Assigned reading (at the time of the submission of study programme proposal)

M. Tamer Ozsu, Patrick Valduriez, "Principles of Distributed Database Systems", Prentice Hall 1999.
R. Kimball, M. Ross: The Data Warehouse Toolkit : The Complete Guide To Dimensional Modeling, Wiley, New York, 2002.
D.W. Embley: Object Database Development, Concepts and principles, Addison Wesley, 1997.

1.11. Optional / additional reading (at the time of proposing study programme)

R. Elmasri, S.B. Navathe: Fundamentals of Database Systems, Pearson - Addison Wesley, Boston, 2004.
C.J. Date, H. Darwen: Foundation for Object/Relational Databases: The third Manifesto, Addison Wesley, 1998.
W.H. Inmon: Building the Data Warehouse (Third Edition). Wiley, New York, 2002.
A.U. Tansel et.al.: Temporal Databases, The Benjamin/Cummings Publ. Co., 1993.

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

Title	*Number of copies*	*Number of students*

1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Quality of the course will be monitored and measured through the success of examinations and through the anonymous inquiry reflecting students opinions regarding the course.

Basic description		
Course coordinator	**Dragan Čišić**	
Course title	ELECTRONIC COMMERCE	
Study programme	INFORMATICS	
Course status	compulsory	
Year	I	
ECTS credits and teaching	ECTS student 's workload coefficient	6
	Number of hours (L+E+S)	**30+30+0**

1. COURSE DESCRIPTION

1.1. Course objectives

To assist students to understand how the electronic technologies and Internet can be put to work for your business, especially to new business models. To describe new technologies usage in business to business data exchange in transport and logistics.
To enhance students understanding of "Virtual Corporation" and advantages of the global customer base. To introduce risk, security, and privacy concepts and methodologies on the Internet.

1.2. Course enrolment requirements

I

1.3. Expected course learning outcomes

A student completing this course unit should:
1) have an understanding of how ecommerce and web based applications are designed, built and implemented.
2) have a knowledge of tools, technologies, concepts and processes, that comprise the technical and business infrastructure of eCommerce
3) have a knowledge of data architecture and be able to solve problems about modeling data and processes in ebusiness environment

1.4. Course content

Electronic commerce. Internet economy. eCommerce business types (B2B,B2C,G2C etc.)Electronic data interchange. Electronic commerce in SME's. eCommerce business models (case studies) Innovations in eBusiness. Business models. Technologies for connecting companies. Markets and business competition. Strategies for marketing. Applications in company. Application integration. Companies integration. Electronic channels. Virtualč companies. Electronic markets. ePAying. eBusiness security. Legal aspect of electronic business. Transaction costs and other economic aspects. Internet technologies. Case studies. Transport and logistics application

1.5. Teaching methods		
	☒ lectures	☒ individual assignment
	☐ seminars and workshops	☒ multimedia and network
	☒ exercises	☐ laboratories
	☐ long distance education	☐ mentorship
	☐ fieldwork	☒ other - consultation

1.6. Comments	*I*

1.7. Student's obligations

1.8. Evaluation of student's work

Course attendance	1	Activity/Participation	1	Seminar paper		Experimental work	1
Written exam	1	Oral exam		Essay		Research	
Project	2	Sustained knowledge check		Report		Practice	
Portfolio							

1.9. Assessment and evaluation of student's work during classes and on final exam

1.10. Assigned reading (at the time of the submission of study programme proposal)

1.Dragan Čišić, Electronic commerce, MIPRO HU, Rijeka, 2000, str. 107
2.The emerging digital economy II – report 1999 – US department of commerce
3.European Union and electronic commerce www.ispo.cec.be
4.Paul Timmers, Electronic Commerce: Strategies and Models for Business – to – Business Trading Willey, 1999
5.Philipp Gerbert, Alex Birch, Digital Storm: fresh Business Strategies form the electronic Marketplace, Willey, 2001

1.11. Optional / additional reading (at the time of proposing study programme)

Ranko Smokvina, Dragan Čišić, Uvod u elektroničku razmjenu podataka i EDIFACT normu – Rijeka/i.e./Zagreb: HRAST, 1994
www.ecommerce.gov

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

Title	*Number of copies*	*Number of students*

1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Periodical evaluation and assessment of students and teachers is foreseen in order to provide continuous improvement of teaching quality. During the last week of classes, a poll will be conducted, where students would evaluate the quality of classes. Students' achievements will be analyzed.

Basic description		
Course coordinator	**Nataša Hoić - Božić**	
Course title	MULTIMEDIA AND HYPERMEDIA SYSTEMS	
Study programme	INFORMATICS	
Course status	compulsory	
Year	I	
ECTS credits and teaching	ECTS student 's workload coefficient	6
	Number of hours (L+E+S)	30+30+0

1. COURSE DESCRIPTION

1.1. Course objectives

In the context of this course the students acquire basic knowledge about main concepts, technologies and standards of multimedia and hypermedia and about the process of developing and implementing multimedia and hypermedia presentations.

1.2. Course enrolment requirements

/

1.3. Expected course learning outcomes

Upon completion of course, students will be able to do the following:

1. define, describe and distinguish between the concepts of multimedia and hypermedia
2. identify and define the hypermedia data model
3. analyze various types of hypermedia and multimedia presentations
4. use multimedia and hypermedia authoring tools

plan, prepare, develop and evaluate hypermedia and multimedia presentations

1.4. Course content

Definition of multimedia and hypermedia. Interactivity. Comparison: multimedia, hypertext, hypermedia. Hypermedia computer networks and global hypermedia (WWW). The role of multimedia and hypermedia in society.

Characteristics of hypermedia node-link data model. Problems with hypermedia model and possible solutions. Adaptive hypermedia. Structure of adaptive hypermedia systems. Methods and techniques for adaptation.

Process of multimedia and hypermedia systems authoring, comparison with information systems developing. Phases in multimedia and hypermedia presentations developing. Basics of multimedia design. Information design, interface design, and navigation.

Basic usage of multimedia and hypermedia authoring tools for off-line and online multimedia and hypermedia systems developing.

1.5. Teaching methods	☒ lectures ☒ seminars and workshops ☒ exercises ☒ long distance education ☐ fieldwork	☒ individual assignment ☒ multimedia and network ☐ laboratories ☐ mentorship ☒ other - consultation

1.6. Comments	*/*

1.7. Student's obligations

In order to acquire required number of ECTS credits, students should attend the classes, actively participate in all forms of works (including e-learning by using LMS), perform practical exercises, produce seminar papers, and pass the final exam. The students should produce a multimedia or hypermedia presentation as an individual or team project. They should pass the exam consisting of practical and oral part. This practical exam, seminar papers and project are the prerequisite for the oral part of the exam where the complete knowledge of the student is examined and evaluated.

1.8. Evaluation of student's work

Course attendance	1	Activity/Participation	1	Seminar paper	2	Experimental work	
Written exam	0,5	Oral exam	0,5	Essay		Research	
Project		Sustained knowledge check	1	Report		Practice	
Portfolio							

1.9. Assessment and evaluation of student's work during classes and on final exam

1.10. Assigned reading (at the time of the submission of study programme proposal)

1. Online textbook
2. Vaughan, T. (2003). Multimedia : Making It Work, Berkeley: McGraw-Hill Osborne Media.

1.11. Optional / additional reading (at the time of proposing study programme)

Niederst, J. (2007). Learning Web Design, 3rd Edition. O'Reilly.
Frick, T, (2007). Managing Interactive Media Projects. CENGAGE Delmar Learning.
Software textbooks

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

Title	*Number of copies*	*Number of students*

1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

During the last week of classes, a poll will be conducted, where students would evaluate the quality of classes. Students' achievements will be analyzed.

Basic description		
Course coordinator	**Ivo Ipšić**	
Course title	INTODUCTION TO DIGITAL SPEECH AND IMAGE PROCESSING	
Study programme	*INFORMATICS*	
Course status	compulsory	
Year	I	
ECTS credits and teaching	ECTS student 's workload coefficient	6
	Number of hours (L+E+S)	**30+30+0**

1. COURSE DESCRIPTION

1.1. Course objectives

The purpose of the course is to introduce students with basic principles of digital signal processing.

1.2. Course enrolment requirements

I

1.3. Expected course learning outcomes

After finishing the course, the students will be able to:

- understand basic principles of digital signal processing
- apply digital signal processing methods in multimedia software applications
- apply digital signal processing methods in algorithms for speech and video signal processing.

1.4. Course content

Signal classification. Mathematical models of signals. The Fourier Transform.
Stohastic signals. Corerelation. Covariance.
Ergodic signals. Stationary signals.
The sampling theorem
Spectrum. Discrete Fourier Transform.
Digital filter design. The Fast Fourier Transform.
Speeech signal processing. Video signal processsing.
Signal compression algorithms.

1.5. Teaching methods	☒ lectures ☐ seminars and workshops ☒ exercises ☐ long distance education ☐ fieldwork	☒ individual assignment ☐ multimedia and network ☐ laboratories ☐ mentorship ☐ other

1.6. Comments	*I*

1.7. Student's obligations

It is compulsory for students to attend exercises. A student has to pass the written (practical) part of the examination which regards the exercises, as the precondition to take the oral part of examination where the complete knowledge of the student is examined and evaluated.

1.8. Evaluation of student's work

Course attendance	0,5	Activity/Participation		Seminar paper	1	Experimental work	
Written exam	1	Oral exam		Essay		Research	
Project	2,5	Sustained knowledge check	1	Report		Practice	
Portfolio							

1.9. Assessment and evaluation of student's work during classes and on final exam

1.10. Assigned reading (at the time of the submission of study programme proposal)

L.R. Rabiner. Theory and Application of Digital Signal Processing. Prentice-Hall, 1975.
L.R. Rabiner, R. W. Schafer: Digital Processing of Speech Signals, Prentice Hall; 1 edition, 1978.

1.11. Optional / additional reading (at the time of proposing study programme)

A. V. Oppenheim, R. W.Schafer, J. R. Buck: Discrete-Time Signal Processing, Prentice Hall, Englewood Cliffs, 2 edition ,1999.
S. K. Mitra: Digital Signal Processing: a Computer-Based Approach, McGraw-Hill Co. Inc. New York, 1998.

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

Title	*Number of copies*	*Number of students*

1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Annonimus poll in the end of semester. Statistical reports on results obtained on quizies, partial exams, homeworks and final project. In the end statistical report on passing.

4.2 V. YEAR OF STUDY

Basic description		
Course coordinator		
Course title	COMMUNICATION SKILLS	
Study programme	**INFORMATICS**	
Course status	compulsory	
Year	II	
ECTS credits and teaching	ECTS student 's workload coefficient	2
	Number of hours (L+E+S)	**15+0+15**

1. **COURSE DESCRIPTION**		
1.1. Course objectives		
The course goal is to provide understanding of fundamental knowledge about interpersonal communication, about verbal and nonverbal communication, and to enhance skills at interpersonal communication.		
1.2. Course enrolment requirements		
This course is correspondent with similar courses on other universities. There are no prerequisites for this course. The course is correlated with social psychology.		
1.3. Expected course learning outcomes		
After completing this course, student will be able to communicate more skilfully, to recognize some courses of unsuccessful interpersonal communication, to improve nonverbal communication, and to learn some communication skills.		
1.4. Course content		
1. Effective communication: Components and process. Communication Types. Communication barriers. Cultural influences. 2. Verbal communication: Language, Meaning. Message clarity. Language formality. Gender differences in communication. 3. Nonverbal communication: Types of nonverbal communication. Functions. Nonverbal expressivity and sensitivity. Verbal and nonverbal contradiction. Self-presentation. 4. Communication in intimate relationships: Communication in family. Communication with partners. 5. Communication skills: - Listening. Importance of listening. Components. Active listening techniques. - Conflict and negotiation. Types of conflict. Causes and consequences. Conflict resolution. - Assertiveness: What is assertiveness. Causes of nonassertiveness. Special techniques of assertive communication. Public communication: Purpose of the speech. Characteristics of audience. Organising the speech. Presenting the speech. - Communication in the workplace: Communication in organisation. Communication climate. Communication in work teems. Leadership.		
1.5. Teaching methods	☒ lectures ☐ seminars and workshops ☒ exercises	☐ individual assignment ☐ multimedia and network ☐ laboratories

	☐ long distance education ☐ fieldwork	☒ mentorship ☐ other

1.6. Comments

1.7. Student's obligations

Students must be active and participate in class activities.

1.8. Evaluation of student's work

Course attendance	1	Activity/Participation		Seminar paper	1	Experimental work	
Written exam		Oral exam		Essay		Research	
Project		Sustained knowledge check		Report		Practice	
Portfolio							

1.9. Assessment and evaluation of student's work during classes and on final exam

1.10. Assigned reading (at the time of the submission of study programme proposal)

Adubato, S., Foy DiGeronimo, T. (2004). Govorite iz srca. Alinea, Zagreb.
Reardon, K.K. (1987). Interpersonalna komunikacija, Alinea, Zagreb.
Schultz von Thun, F. (2001). Kako međusobno razgovaramo, Erudita, Zagreb.
Tannen, D. (1998). Ti to baš ne razumiješ, Zagreb, Izvori.
Zarevski P, Mamula M. (2000). Pobijedite sramežljivost - a djecu cijepite protiv nje, Slap, Zagreb.

1.11. Optional / additional reading (at the time of proposing study programme)

Adler, R.B., Rodman, G. (2000). Understanding Human Communication (7. izd.), Harcourt, F
Breakwell, G.M. (2001). Vještine vođenja intervjua. Jastrebarsko, Naklada Slap.orth Worth.
Burgoon, M., Hunsaker, F.G., Dawson, E.J. (1994). Human communication (3. Izd.), Thousand Oaks, Sage.
DeVito, J.A. (1989). The Interpersonal Communication Book, Harper & Raw, New York.
Ekman, P. (2003). Emotions Revealed. Holt, New York.
Knapp, M., Hall, J.A. (2002). Nonverbal Communication in Human Interaction, Wadsworth, Belmont.(5. izd.)
Lucas, S.E. (1998). The Art of Public Speaking. McGraw Hill, New York.
McDaniel, R. (1994). Scared Speechless: Public Speaking Step by Step, Thousand Oaks, CA, Sage.
Reardon, K.K. (1987). Interpersonalna komunikacija, Alinea, Zagreb.
Trenholm, S., Jensen, A. (2000). Interpersonal Communication, (4. izd.), Wadsworth, Belmont.
Tubbs, S. L., Moss, S. (1991). Human Communication (6. izd.), McGraw-Hill, New York.
Verderber, K.S., Verderber, R.F. (2001). Inter-Act. Interpersonal Communication Concepts, Skills, and Contexts, 9th ed., Wadsworth, Belmont.

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

Title	*Number of copies*	*Number of students*

1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Periodical evaluation and assessment of students and teachers is foreseen in order to provide continuous improvement of teaching quality. During the last week of classes, a poll will be conducted, where students

would evaluate the quality of classes. Students' achievements will be analyzed.

Basic description		
Course coordinator		
Course title	MASTER THESIS SEMINAR	
Study programme	**INFORMATICS**	
Course status	compulsory	
Year	II	
ECTS credits and teaching	ECTS student 's workload coefficient	4
	Number of hours (L+E+S)	**0+30+0**

1. COURSE DESCRIPTION

1.1. Course objectives

Introduce students to research work and research methodology The course content is related to the topic of the master thesis.

1.2. Course enrolment requirements

I

1.3. Expected course learning outcomes

Students will be familiar with basic principles of research methodology and scientific writing

1.4. Course content

Basic introduction to scientific research, methodologies and practical aspects.
Literature search, thesis choise. Scientific writing. Problem solving techniques. Thesis structering and writing
Ethical aspects of research. Copyright issues.

1.5. Teaching methods	☒ lectures ☐ seminars and workshops ☐ exercises ☐ long distance education ☐ fieldwork	☐ individual assignment ☐ multimedia and network ☐ laboratories ☒ mentorship ☒ other ---tutorials

1.6. Comments

1.7. Student's obligations

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1.8. Evaluation of student's work

Course attendance		Activity/Participation		Seminar paper	2	Experimental work	
Written exam		Oral exam		Essay		Research	1
Project		Sustained knowledge check	1	Report		Practice	
Portfolio							

1.9. Assessment and evaluation of student's work during classes and on final exam

1.10. Assigned reading (at the time of the submission of study programme proposal)

Vujević, M. *Uvod u znanstveni rad u području društvenih znanosti*. Informator, Zagreb, 1990.
Skupina autora, *Etički kodeks Sveučilišta u Rijeci*. Sveučilište u Rijeci, Rijeka, 2003.

1.11. Optional / additional reading (at the time of proposing study programme)

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1.12. Number of assigned reading copies with regard to the number of students currently attending the course

Title	*Number of copies*	*Number of students*

1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Annonimus poll in the end of semester. Statistical reports on results obtained on quizies, partial exams, homeworks and final project. In the end statistical report on passing.

Basic description		
Course coordinator		
Course title	INFORMATION TECHNOLOGY AND SOCIETY	
Study programme	**INFORMATICS**	
Course status	compulsory	
Year	II	
ECTS credits and teaching	ECTS student 's workload coefficient	5
	Number of hours (L+E+S)	**30+30+0**

1. COURSE DESCRIPTION

1.1. Course objectives

To introduce students into the dynamics of the development and spread of information and communication technology (ICT), as well as into the economic, social and cultural impacts this technology has. To present the development of various products of information industry and to point out on their economic and social impacts, as well as on the perspectives and challenges of their future development.

1.2. Course enrolment requirements

This course is correlated with virtually all the others informatics courses. The content of this course presupposes the knowledge which is presented in other informatics courses, because this course gives a critical analysis and evaluation of information technology, of its products and of their social impacts. The content of this course especially presupposes an acquaintance with the basics of the computer communication systems.

1.3. Expected course learning outcomes

Students are expected to get an insight into the dynamics of the development, use and spread of information and communication technology (ICT), with the emphasis on the economic, social and cultural effects of this technology. Students are expected to get acquainted with various new products of information industry, with the causes and ways of their development, spread and use, as well as with the perspectives and challenges of their further development, as specified in the "Course content" below.

1.4. Course content

Historical development of the basic elements of information and communication technology (ICT): audio-devices, video-devices, computer technology, the Internet, wireless and mobile communication systems. Contemporary means and methods of mass communications: technological basis, contents, and impacts.

Network techno-economy and globalization. E-business and network corporations. The impact of the new technologies on the kinds and forms of work. Flexibility. General social environment and technological development. Models and factors of the technological and economic development. Information technology, social changes and social divisions. Information technology and global business (economic) crime.

The culture of virtual reality: a new paradigm of space and time. Individual freedoms, communities, social institutions and the possibilities of control (surveillance) in the conditions of contemporary information technology. Social identity of the individuals, communities and organizations in the network society. Sources and forms of the resistance to the global techno-economy.

Technological, economic and social perspectives: multimedia, communication superhighways, and new technologies of data processing and transmission. The information society: interactive forms of communication, shaping and creation. Privacy, security and surveillance: risks and the possibilities of protection. Technological, economic and social perspectives: possibilities, challenges and dangers of the information age.

1.5. Teaching methods	☒ lectures ☒ seminars and workshops ☐ exercises ☐ long distance education ☐ fieldwork	☐ individual assignment ☐ multimedia and network ☐ laboratories ☐ mentorship ☐ other

1.6. Comments	

1.7. Student's obligations

Students are required to take part in all forms of the work related to the course, and to write and present a paper (seminar), individually or in groups. (A group can comprise up to four students.) The entire knowledge of the student is examined and evaluated in the final oral examination.

1.8. Evaluation of student's work

Course attendance		Activity/Participation		Seminar paper	2	Experimental work	
Written exam		Oral exam	3	Essay		Research	
Project		Sustained knowledge check		Report		Practice	
Portfolio							

1.9. Assessment and evaluation of student's work during classes and on final exam

1.10. Assigned reading (at the time of the submission of study programme proposal)

Radovan, M.: *Information technology and society*, 2004. (digital course material, 144 pages; it is renewed every year; in Croatian language).
Webster, F. and, Puoskari, E. (eds): *The Information Society Reader*, Routledge, 2004.
Castells, M: *Internet galaksija: Razmišljanja o Internetu, poslovanju i društvu*, Naklada Jesenski i Turk, 2003.
Winston, B.: *Media Technology and Society: From the Telegraph to the Internet*, London: Routledge, 1998.

1.11. Optional / additional reading (at the time of proposing study programme)

May, C. (ed): *Key Thinkers for the Information Society*, Routledge, 2003.
Ong, A., Collier, J. S.: *Global Assemblages: Technology, Politics and Ethics as Anthropological Problems*, Blackwell, 2005.
Rheingold, H.: *The Virtual Community*, The MIT Press, 2000.
Rochlin, I. G.: *Trapped in the Net*, Princeton UP, 1997.

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

Title	*Number of copies*	*Number of students*

1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Periodical evaluation and assessment of students and teachers is foreseen in order to provide continuous improvement of teaching quality. During the last week of classes, a poll will be conducted, where students would evaluate the quality of classes. Students' achievements will be analyzed.

Basic description		
Course coordinator		
Course title	MANAGEMENT	
Study programme	**INFORMATICS**	
Course status	compulsory	
Year	II	
ECTS credits and teaching	ECTS student 's workload coefficient	6
	Number of hours (L+E+S)	**30 0 +30**

1. COURSE DESCRIPTION

1.1. Course objectives

The basics of management, planning, decision making, leading and organizing the business will be presented to students. The students will be introduced with management theory and practice in companies.

1.2. Course enrolment requirements

This course is correspondent with Economics, Information Technology Project Management and all courses in development of ICT systems.

1.3. Expected course learning outcomes

Students are expected to learn the basic elements of the management, leadership, planning, decision making in the ICT Organizations. The students will be familiar with different methodology and tools for managing the processes in ICT business.

1.4. Course content

The theory of organization. Organizational functions. Management, organizing, planning, leadership and decision making. Small and big organizations. Entrepreneurship. The market strategy and competition. Planning. Human resources. Quality. Total quality management. The costs analysis. SWOT Analysis. The measurement of business success factors. Strategic, tactical and operational management. The decision making process. The goal based management. Psycho sociological aspects of management. Motivation and team work. Communications. Conflict solving techniques. Negotiation techniques

1.5. Teaching methods	☒ lectures ☒ seminars and workshops ☐ exercises ☐ long distance education ☐ fieldwork	☐ individual assignment ☐ multimedia and network ☐ laboratories ☒ mentorship ☐ other

1.6. Comments

1.7. Student's obligations

Students must be active and participate in class activities.

1.8. Evaluation of student's work

Course attendance	1	Activity/Participation	1	Seminar paper	2	Experimental work	
Written exam	1	Oral exam		Essay		Research	
Project		Sustained knowledge check	1	Report		Practice	
Portfolio							

1.9. Assessment and evaluation of student's work during classes and on final exam

1.10. Assigned reading (at the time of the submission of study programme proposal)

Pavlić, M.:Menadžment i upravljanje, 2004. (digitalna skripta, 100 stranice; skripta se obnavlja svake godine)
Žugaj, M., R. Brčić: Menadžment, FOI, Varaždin, 2003.

1.11. Optional / additional reading (at the time of proposing study programme)

Žugaj, M., J. Šehanović, M. Cingula: Organizacija, II. izmijenjeno i dopunjeno izdanje, TIVA i FOI, Varaždin, 2004.
Čengić, D.: Vlasnici, menadžeri i kontrola poduzeća, Institut društvenih znanosti Ivo Pilar,Zagreb, 2001.
Vives, X. (editor): Corporate Governance, Theoretical and Empirical Perspectives,Cambridge University Press, 2000.

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

Title	*Number of copies*	*Number of students*

1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Periodical evaluation and assessment of students and teachers is foreseen in order to provide continuous improvement of teaching quality. During the last week of classes, a poll will be conducted, where students would evaluate the quality of classes. Students' achievements will be analyzed.

Basic description		
Course coordinator		
Course title	INFORMATION TECHNOLOGY PROJECT MANAGEMENT	
Study programme	**INFORMATICS**	
Course status	compulsory	
Year	II	
ECTS credits and teaching	ECTS student 's workload coefficient	6
	Number of hours (L+E+S)	**30+0+30**

1. COURSE DESCRIPTION

1.1. Course objectives

Introduce students to planning and management of project in the field of information and communication technology
Master method for network planning of IT projects

1.2. Course enrolment requirements

The course program correlates with courses Information systems, Organization information systems, Strategic IS planning.

1.3. Expected course learning outcomes

After completing course Information technology project management students are expected to be capable of:
- define project managment problems and solutions
- Producing network plan for an IT project
- Calculating project costs
- Managing IT team
.....- Prepare IT project documentation.

1.4. Course content

Project definition. Objectives, time frames, resources and restrictions. Project organization and method of work. Projects types.
Project stages. Project activities planning. Network planning. PERT, CPM, Gantt chart. Critical path time analysis. Cost analysis. Resources analysis. Supervision of project realization.
Project teams. Types of teams. Roles in team. Roles in information technology development project.
Tasks and functions of a project manager. Motivation, communication and solving conflicts. Techniques for fostering creativity in team. Emotional intelligence and teamwork. Proactive management.

1.5. Teaching methods	☒ lectures ☒ seminars and workshops ☒ exercises ☐ long distance education ☐ fieldwork	☒ individual assignment ☐ multimedia and network ☐ laboratories ☐ mentorship ☐ other

1.6. Comments	Real life situations are simulated during exercises.

1.7. Student's obligations

Students should actively participate in all forms of works, produce a seminar paper on IT project plan and pass the written exam.

1.8. Evaluation of student's work

Course attendance	1	Activity/Participation		Seminar paper		Experimental work	
Written exam	2	Oral exam		Essay		Research	
Project	3	Sustained knowledge check		Report		Practice	
Portfolio				Fali 1			

1.9. Assessment and evaluation of student's work during classes and on final exam

1.10. Assigned reading (at the time of the submission of study programme proposal)

Harold Kerzner: Project Management: A System Approach to Planning Schedulling and Controlling, John Wiley & Sons, New Jersey, 2003.
Robert Wysocki, Rudd McGary: Effective Project Management: Traditional, Adaptive, Extreme. 3rd edition, John Wiley & Sons, Chichester, 2003.
Jack. Marchewka, Information Technology Project Management: Providing Measurable Organizational Values,John Wiley & Sons, 2nd edition 2006.
Michael West: Tajne uspješnog upravljanja timom. Školska knjiga Zagreb, 2005.

1.11. Optional / additional reading (at the time of proposing study programme)

Bob Huges, Mike Coterell: Software Project Management. 2nd edition, McGraw Hill, UK, 1999.Tudor, G., Srića, V.: Menedžer i pobjednički timovi, MEP Consult, Zagreb, 1996.
Panadian Ravinranath, Applied Software Risk Management: A Guide for Software Project Managers, Auerbach Publication, Taylor&Francis, USA, 2007.
Burke, Rory: Project Management, 8th edition, John Wiley & Sons, Chichester, 1999

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

Title	*Number of copies*	*Number of students*

1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

During the last week of classes, a poll will be conducted, where students would evaluate the quality of classes. Students' achievements will be analyzed.

Basic description		
Course coordinator		
Course title	ORGANIZATION'S INFORMATION SYSTEMS	
Study programme	**INFORMATICS**	
Course status	compulsory	
Year	II	
ECTS credits and teaching	ECTS student 's workload coefficient	6
	Number of hours (L+E+S)	**30+0+30**

1. COURSE DESCRIPTION

1.1. Course objectives

- to introduce the subject of information system data modelling, process modelling and application modelling to the students and to build the applications on the basis of its data models
- to acquaint the students with information systems in various organizations
- the students have to model and build an appropriate application to cover certain business functions of an organization
- hands-on experience in the fields of modelling, RAD tools, databases and programming languages

1.2. Course enrolment requirements

The course program is in correlation with the following courses: Data modelling, Process modelling, Software Engineering, Information systems

1.3. Expected course learning outcomes

After finishing the course, the students will be able to:
- build an application covering a single function of an organization system on their own
- organize a database structure and fill the database data from external tables
- write the application user manual
- teach the users how to use the application

1.4. Course content

Process modelling and business functions modelling. Documentation analysis and data modelling. Main project. Executive project. Project goal. Semantically rich data modelling. Translating from entity-relationship data model to relational model. Physical database modelling. Modelling the application architecture. Case studies: Study recordkeeping information system, High school IS, Main ledger, Customer and Supplier accounts, Cash-desk business, Production planning and monitoring, IS for planning and monitoring TV channels, Warehouse business, Loans, Staff, Salaries, Insurance, Bookstores, Medical care, etc.
Building a database and an application for a certain system. Writing the necessary documentation and adhering to specified standards.
Testing the final application product. Instructing. Implementation. Maintenance.

1.5. Teaching methods	☒ lectures ☐ seminars and workshops ☐ exercises ☐ long distance education ☐ fieldwork	☒ individual assignment ☐ multimedia and network ☐ laboratories ☒ mentorship ☒ other ---practice
1.6. Comments	The seminars offer an opportunity to the students to learn specific modelling and application building skills based on concrete, everyday examples. They work on their models, database data organization and database operation organization either alone	

	or with their mentor guiding them. **The students build their own project which covers a single business function.**

1.7. Student's obligations

The students are obliged to actively participate in all forms of activities, they have to produce a seminar paper and pass the final written and oral exam.

1.8. Evaluation of student's work

Course attendance	1	Activity/Participation	0,75	Seminar paper	1	Experimental work	
Written exam	1	Oral exam	1	Essay		Research	
Project		Sustained knowledge check		Report		Practice	1
Portfolio				fali			

1.9. Assessment and evaluation of student's work during classes and on final exam

1.10. Assigned reading (at the time of the submission of study programme proposal)

Pavlić, M., Razvoj informacijskih sustava - projektiranje, praktična iskustva, metodologija, Znak, Zagreb, 1996.
Varga, M., Baze podataka - konceptualno, logičko i fizičko modeliranje podataka, DRIP, Zagreb, 1994.

1.11. Optional / additional reading (at the time of proposing study programme)

Prižmić, M., Veček, N., Saldakonti kupaca, HRT, Zagreb, 2001.
Šribar, B., Blagajničko poslovanje, Hrvatska banka za obnovu i razvitak, Zagreb, 2000.
Šarčević, M.Zapošljavanje, "3.maj" Brodogradilište, Rijeka, 2001.
Kučer, F., Krediti građana, Zagrebačka banka – Pomorska banka Split, Split, 1997.
Avar, Z., Davidović, M., Programski podsustav za praćenje emitiranja TV programa, HRT, Zagreb, 2001.

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

Title	*Number of copies*	*Number of students*

1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

During the last week of the course the students will be presented with an anonymous survey which will serve to measure the course quality. Also, there will be an exam success analysis.

Basic description		
Course coordinator		
Course title	NETWORK SYSTEMS MANAGEMENT	
Study programme	**INFORMATICS**	
Course status	compulsory	
Year	II	
ECTS credits and teaching	ECTS student 's workload coefficient	6
	Number of hours (L+E+S)	60 2+0+2)

1. COURSE DESCRIPTION

1.1. Course objectives

The objectives of this course are to teach students the elements of the network systems management. These elements include processes of the network systems protection from various kinds of attacks, creating backups and data storing, performances control and the optimization of functioning of the network system.

1.2. Course enrolment requirements

This course continues with the presentation of the basic knowledge about the computer network systems. Content of this course relays upon the contents presented in the courses "Computer networks 1", "Computer networks 2", "Programming for the Internet 1", and "Programming for the Internet 2".

1.3. Expected course learning outcomes

Students are expected to learn the basic elements of the network systems management. These elements include processes of the network systems protection from various kinds of attacks, creating backups and data storing, performances control and the optimization of functioning of the network system. Students will be competent to manage computer network systems.

1.4. Course content

Basics of the network documentation and planning. The realization of the OSI model in the MS Windows operating systems. Network layer protocols in practice (IP, TCP, DHCP, ARP). Directory services (LDAP, AD, DNS, WINS).

Network firewalls and intermediary servers: firewalls and TCP/IP, packets filtering, proxy servers, network passages at the circuit level, SPI network barriers. Basics of the network security: types of attacks, intrusion detection, procedures of preventing and resolving the security accidents.

Data storing on the network. NAS devices, networks of NAS devices. Backup data copies on the network: data restoring from the network, techniques of producing copies; logs, cyclic use of tapes, applications for the creation of security copies on the network.

Security of services and the protection of network from viruses: types of viruses, server anti-virus software, detection and removal of viruses.

Basics of the web server administration: installing web sites, virtual directories, access authorizations, web server protection. Computer network administration: basic principles of administration and the system SNMP, methods of management and of problem solving.

1.5. Teaching methods	☒ lectures ☒ seminars and workshops ☒ exercises ☐ long distance education ☐ fieldwork	☒ individual assignment ☒ multimedia and network ☐ laboratories ☒ mentorship ☐ other

1.6. Comments	

1.7. Student's obligations

Students are required to attend exercises. A student must pass the written (practical) part of examination which regards the exercises, as the precondition to take the oral part of examination where the complete knowledge of the student is examined and evaluated.

1.8. Evaluation of student's work

Course attendance	1	Activity/Participation	1	Seminar paper		Experimental work	
Written exam	2	Oral exam	1	Essay		Research	
Project		Sustained knowledge check		Report		Practice	1
Portfolio							

1.9. Assessment and evaluation of student's work during classes and on final exam

1.10. Assigned reading (at the time of the submission of study programme proposal)

Bigelow, J.S.: *Troubleshooting, Maintaining & Repairing Networks*, Osborne/McGraw-Hill, 2002.
Peterson, L. L., Davie, B. S.: *Computer Networks: A System Approach*, 4rd Edition, Morgan Kaufmann Publishers, 2007.

1.11. Optional / additional reading (at the time of proposing study programme)

Radovan, M.: *Computer Networks*, 2006 (course material in digital form, 287 pages; the material is renewed every year; in Croatian language).
Tanenbaum, A. S.: *Computer Networks*, 4th Edition, Prentice Hall, 2003.

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

Title	*Number of copies*	*Number of students*

1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Periodical evaluation and assessment of students and teachers is foreseen in order to provide continuous improvement of teaching quality. During the last week of classes, a poll will be conducted, where students would evaluate the quality of classes. Students' achievements will be analyzed.

Basic description		
Course coordinator		
Course title	HUMAN – MACHINE COMMUNICATION	
Study programme	**INFORMATICS**	
Course status	compulsory	
Year	II	
ECTS credits and teaching	ECTS student 's workload coefficient	6
	Number of hours (L+E+S)	**30+0+30**

1. COURSE DESCRIPTION

1.1. Course objectives

Introduce the students to the basic pattern classification algorithms and their applications to image and speech recognition systems.

1.2. Course enrolment requirements

The course corresponds to the courses Intelligent systems I and Intelligent systems II.

1.3. Expected course learning outcomes

The students will get basic knowledge about man-machine interfaces and their design.
After finishing the course, the students will be able to:

- understand basic principles of pattern recognition methods
- apply pattern recognition and artificial methods in multimedia software applications
- apply algorithms for speech recognition and sythesis,
- develop applications for spoken dialog systems.

1.4. Course content

Artificial Intelligence. Expert systems. Pattern analysis. Image analysis systems. Speech analysis systems. Speech recognition. Pattern classification. Numerical classification. Linear decision functions. Bayes classifiers. Neural networks.
Speech signals modelling and recognition algorithms. Robot vision. Image classification and understanding algorithms. Applications in robotics, medicine and industry.
Spoken dialog systems. Semantic analysis. Dialog modelling. Speech synthesis.

1.5. Teaching methods		
	☒ lectures	☐ individual assignment
	☒ seminars and workshops	☐ multimedia and network
	☒ exercises	☐ laboratories
	☐ long distance education	☒ mentorship
	☐ fieldwork	☐ other

1.6. Comments

1.7. Student's obligations

It is compulsory for students to attend exercises. A student has to pass the written (practical) part of the examination which regards the exercises, as the precondition to take the oral part of examination where the complete knowledge of the student is examined and evaluated.

1.8. Evaluation of student's work

Course attendance	1	Activity/Participation		Seminar paper	2	Experimental work	

Written exam	2	Oral exam		Essay		Research	
Project		Sustained knowledge check		Report		Practice	
Portfolio				fali			

1.9. Assessment and evaluation of student's work during classes and on final exam

1.10. Assigned reading (at the time of the submission of study programme proposal)

L. Gyergyek, N. Pavešić, S.Ribarić, *Uvod u raspoznavanje uzoraka*, Tehnička knjiga, Zagreb, 1988.
Duda R. O., P.E. Hart, D. G. Stork: Pattern Classification, John Wiley - Interscience, 2nd edition, 2000.

1.11. Optional / additional reading (at the time of proposing study programme)

X. Huang, A. Acero, H. W. Hon: *Spoken Language Processing:A Guide to theory, Algorithm and System Development*, Pretice Hall, New Jersey, USA, 2000.
R. Jain et al., Machine Vision, McGraw-Hill, New York, 1995.

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

Title	*Number of copies*	*Number of students*

1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Annonimus poll in the end of semester. Statistical reports on results obtained on quizies, partial exams, homeworks and final project. In the end statistical report on passing.

Basic description		
Course coordinator		
Course title	KNOWLEDGE DISCOVERY AND DATA MINING	
Study programme	**INFORMATICS**	
Course status	compulsory	
Year	II	
ECTS credits and teaching	ECTS student 's workload coefficient	6
	Number of hours (L+E+S)	60 2+0+2)

1. COURSE DESCRIPTION

1.1. Course objectives

This course introduces basic concepts, tasks, methods, and techniques in data mining. The emphasis is on various data mining problems and their solutions. Students will develop an understanding of the data mining process and issues, learn various techniques for data mining, and apply the techniques in solving data mining problems using data mining tools and systems. Students will also be exposed to a sample of data mining applications.

1.2. Course enrolment requirements

Course program is in correlation with the program of the courses Inteligentni sustavi 1 i 2 (Intelligent systems 1 and 2) which provide the necessary background for this course.

1.3. Expected course learning outcomes

After completing the course students should be able to:
Explain what data mining is and how data mining can be employed to solve real problems.
Recognize whether a data mining solution is a feasible alternative for a specific problem.
Step through the knowledge discovery process and write a report about the results of a data mining session.
Analyse output from data mining tools and evaluate learned results.
Recognize several data mining strategies and know when each strategy is appropriate.
Explain how several data mining techniques build models to solve problems.
Describe the types of problems that can be solved by combining an expert systems problem-solving approach and a data mining strategy.
Apply the software that accompanies the text to solve real problems.

1.4. Course content

Introduction. Data preprocessing. Classification and prediction. Classification by decision tree induction. Bayesian classification. Classification by backpropagation. Rule-based classification. kNN classifier. Evaluating the accuracy of a classifier or predictor. Methods fusion—increasing the accuracy. Midterm exam. Clustering methods. Partitioning methods. Hierarchical clustering. Conceptual clustering. Density-based methods. Cluster evaluation. Mining frequent patterns, associations, and correlations. The Apriori algorithm. Constraint-based association mining. Project presentation and demonstration. Final exam

1.5. Teaching methods		
	☒ lectures	☐ individual assignment
	☐ seminars and workshops	☐ multimedia and network
	☐ exercises	☒ laboratories
	☐ long distance education	☐ mentorship
	☐ fieldwork	☐ other

1.6. Comments	Laboratory work will be done in a computer laboratory.

1.7. Student's obligations

Students are expected to:
attend classes regularly
make necessary preparations for classes
do practical work
present project
pass one midterm exam and a final exam.

1.8. Evaluation of student's work

Course attendance	1	Activity/Participation	1	Seminar paper	1	Experimental work	
Written exam	1	Oral exam		Essay		Research	
Project		Sustained knowledge check		Report		Practice	1
Portfolio				projekt			

1.9. Assessment and evaluation of student's work during classes and on final exam

1.10. Assigned reading (at the time of the submission of study programme proposal)

Han, J. and Kamber, M., Data Mining: Concepts and Techniques, 2nd Edition, Morgan Kaufmann, 2006 .
P. Tan, M. Steinbach and V. Kumar, Introduction to Data Mining, Addison Wesley, 2006.

1.11. Optional / additional reading (at the time of proposing study programme)

Witten, I. H. and Frank, E., Data Mining: Practical Machine Learning Tools and Techniques, Morgan Kaufmann, 2005.
R.S. Michalski, I. Bratko, and M. Kubat, Machine Learning and Data Mining, John Wiley and Sons Ltd, 1998.
Mitchell, T.M., Machine Learning, McGraw-Hill, 1997

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

Title	*Number of copies*	*Number of students*

1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Quality of the course will be monitored and measured through the success of examinations and through the anonymous inquiry reflecting students opinions regarding the course.

Basic description		
Course coordinator		
Course title	KNOWLEDGE MANAGEMENT	
Study programme	**INFORMATICS**	
Course status	compulsory	
Year	II	
ECTS credits and teaching	ECTS student 's workload coefficient	6
	Number of hours (L+E+S)	**30+0+30**

1. COURSE DESCRIPTION

1.1. Course objectives

The course objective is to present methods and tools for knowledge management. The knowledge management goal is integration of implicit and explicit knowledge, the knowledge structuring, formal knowledge representation, knowledge gathering protocols. Tools and techniques for knowledge management will be studied.

1.2. Course enrolment requirements

Content of this course relays upon the contents presented in the courses: Intelligent systems I and Intelligent systems II.

1.3. Expected course learning outcomes

Students are expected to learn the basic elements of the knowledge management systems. The students will

- be aware of the role of knowledge in professional and private life
- understand the impact of knowledge (or lack of it) for important decisions
- understand the necessity for knowledge management to deal with the large amount of knowledge and information
- discuss the role of computer-based tools and technologies for knowledge management
- use the knowledge management tools.

1.4. Course content

Introduction. The knowledge representation and the knowledge management. Types of Knowledge: Factual Knowledge, Subjective Knowledge and Heuristic Knowledge .
Deep and Shallow Knowledge. The knowledge base.
Knowledge Processing: Knowledge Acquisition, Representation and Manipulation.
Knowledge Representation Formalism: Rules, Frames, Semantic Networks, Blackboard Representations, Object-based Representations, Case-Based Reasoning.
Knowledge Representation Tools. Knowledge organization: anthologies and taxonomies.
Knowledge exchange: Capture, Transfer, and Distribution. Semantic web.
Knowledge discovery, knowledge navigation and exchange of knowledge formalism: blogs, forum, intranets.
Knowledge visualization techniques. The effective use of knowledge in business systems.
User Interaction. Constrained Access: Technological Limits and User Limitations. Ethical and Social Dimensions of Knowledge. Impact of Knowledge Access.
Knowledge assessment methods and intellectual property rights.

1.5. Teaching methods	☒ lectures ☒ seminars and workshops	☒ individual assignment ☐ multimedia and network

	☐ exercises ☐ long distance education ☐ fieldwork	☐ laboratories ☐ mentorship ☒ other ---tutorial

1.6. Comments	

1.7. Student's obligations

Students are required to attend exercises. A student must prepare the seminar paper, homework and pass the written (practical) part of examination.

1.8. Evaluation of student's work

Course attendance	1,5	Activity/Participation		Seminar paper	2	Experimental work	
Written exam	2	Oral exam		Essay		Research	
Project		Sustained knowledge check	0,5	Report		Practice	
Portfolio							

1.9. Assessment and evaluation of student's work during classes and on final exam

1.10. Assigned reading (at the time of the submission of study programme proposal)

E.M. Awad, H.M. Ghaziri: Knowledge Management. Pearson Education International, NJ, SAD. 2004.
T.H. Davenport, L. Prusak: Working Knowledge: How Organizations Manage what they Know. Harvard Business School Press, MA, SAD, 2000.

1.11. Optional / additional reading (at the time of proposing study programme)

T.H. Davenport: Information Ecology. Oxford University Press, NY, SAD.1997.
R. Maier, Knowledge Management Systems, 3rd Edition, Springer. Berlin, 2007.

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

Title	*Number of copies*	*Number of students*

1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Periodical evaluation and assessment of students and teachers is foreseen in order to provide continuous improvement of teaching quality. During the last week of classes, a poll will be conducted, where students would evaluate the quality of classes. Students' achievements will be analyzed.

Basic description		
Course coordinator		
Course title	STRATEGIC PLANNING OF INFORMATION SYSTEMS	
Study programme	**INFORMATICS**	
Course status	compulsory	
Year	II	
ECTS credits and teaching	ECTS student 's workload coefficient	5
	Number of hours (L+E+S)	**30+0+30**

1. COURSE DESCRIPTION

1.1. Course objectives

- Introduce students to basic concepts of information system strategic planning, with particular emphasize to understanding and implementation of IS strategic planning methods
- Train students for independent work in IS strategic planning, particularly in organization documentation analysis, understanding of organizational processes and genetic definition of organization information system

1.2. Course enrolment requirements

The program correlates with coursers Data modeling, Process modeling, Software engineering, and it is necessarily preceded by course Information systems.

1.3. Expected course learning outcomes

After completing the course and meeting requirements in respect to course IS Strategic planning, students are expected to be capable of:
- Assessment of information system complexity in a particular organization on the basis of respective process model, valid organizational documentation and interview with management
- Analyzing existing business technology in a particular organization and proposing optimal strategic structure on the basis of information flows exchange,
- Assessment of organization readiness to introduce information system,
- Proposing database structure on the basis of analysis of the affinities existing among entities.

1.4. Course content

Information system basics. Descriptive and genetic definition of IS. IS genetic taxonomy space. Assessment of IS complexity on the basis of organizational processes. Genetic taxonomic series of particular IS. Basics on organizations. IT organization.
Review of IS development methods. Approaches to IS development. James Martin's information engineering pyramid. Waterfall, evolutionary and spiral model of IS development. Relation between strategic planning and IS strategic planning. Structure of IS strategic planning process. Methods of IS strategic planning. SWOT analysis. Decomposition of targets, structure and functions. Analysis of product/service life cycle. Matrix presentation of processes/data classes - business technology matrix. Optimal structure of business organizational system. Reengineering of business processes. Information system architecture - definition of information subsystems. Affinity calculation. Grouping of processes into organizational sub entities. Grouping of entities into databases. Special methods for information system design. Development of information subsystems.

1.5. Teaching methods	☒ lectures ☒ seminars and workshops ☐ exercises	☐ individual assignment ☐ multimedia and network ☐ laboratories

	☐ long distance education ☐ fieldwork	☐ mentorship ☐ other
1.6. Comments	During exercises, students independently solve some tasks occurring in implementation of IS strategic planning methods thus proving their understanding of issues referring to building information system.	

1.7. Student's obligations

Students should actively participate in all forms of works and should pass the exam consisting of written and oral part.

1.8. Evaluation of student's work

Course attendance	1	Activity/Participation	1	Seminar paper		Experimental work	
Written exam	1	Oral exam	1	Essay		Research	
Project		Sustained knowledge check	1	Report		Practice	
Portfolio							

1.9. Assessment and evaluation of student's work during classes and on final exam

1.10. Assigned reading (at the time of the submission of study programme proposal)

Dobrović, Ž: Strategijsko planiranje IS, elektronička skripta.
Dobrović, Ž., "Strategijsko planiranje, poslovna i informacijska arhitektura, Zbornik radova savjetovanja CASE 12, Opatija 2000.
Martin, J., Leben, J.: Strategic Information Planning Methodologies, Prentice Hall, Englewood Cliffs, N.J., 1989., p.328

1.11. Optional / additional reading (at the time of proposing study programme)

Brumec, J. (1996). A contribution to IS general taxonomy. In Proceedings of the 7th International Conference on Information Systems 96, p. 95-105, Varaždin, Croatia.
Brumec, J. (1998). Strategic Planning of Information Systems. Journal of Information and Organizational Sciences, Vol. 2, p. 11-26, Varaždin, Croatia.
Brumec, J. and V. Dušak (1999). The assessment of IS complexity based on genetic taxonomy. In Evolution and Challenges in System Development (ed. Zupančič, J. et al.), Kluwer Academic / Plenum Publishers, New York, USA.
Brumec, J., Dušak, V. and N. Vrček. (2001). Framework for strategic planning of information systems. In Proceedings of the 7th Americas Conference on Information Systems, pp. 1701-1707, Boston, USA.
Dobrović, Ž., "Metode oblikovanja softvera", Zbornik radova savjetovanja CASE 13, Opatija 2001.
Pavlić, M.: Razvoj informacijskih sustava, Znak, Zagreb, 1996.
Ward, J., Griffiths, P.: Strategic Planning for Information Systems, John Wiley & Sons, New York, 1996.

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

Title	*Number of copies*	*Number of students*

1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences
During the last week of classes, a poll will be conducted, where students would evaluate the quality of classes. Students' achievements will be analyzed.

Basic description		
Course coordinator		
Course title	LOGISTICS	
Study programme	**INFORMATICS**	
Course status	compulsory	
Year	II	
ECTS credits and teaching	ECTS student 's workload coefficient	5
	Number of hours (L+E+S)	**30+0+30**

1. COURSE DESCRIPTION

1.1. Course objectives

This subject is a survey of analytic tools, approaches, and techniques that are useful in the design and operation of logistics systems and integrated supply chains in transportation environment. The four primary objectives of this course are:

1. Introduce students to the analytic model based approach for analyzing logistics problems,
2. Reinforce the importance of using total supply chain costs in all analysis,
3. Provide students with techniques for measuring and managing supply chain uncertainty, and
4. Introduce the idea of using a portfolio of solutions, rather than a single approach, for real-world logistics problems.

1.2. Course enrolment requirements

This course is correspondent with Management.

1.3. Expected course learning outcomes

System synthesis in integrated logistic approach. International environment adaptability. Team work.
A student completing this course unit should be able to:

1. create analytic model based approach to logistic problems
2. analyze cost structures in logistic and CRM systems

1.4. Course content

Logistics. Logistic planning. Logistic strategies. Quality and sustainability in logistics. Distribution systems. Distribution channels. Transport modes analyses. Multimodal transport from Logistic view. Road transport. Railroad transport. Maritime transport. Air transport. Transport in manufacturing. Transport costs. Logistics of maritime transport. Logistic networks modeling.. Document flow models. Cargo flow models. Logistic cost concept Origin inventory costs. In transit inventory costs. Safety stock costs. Perishable costs. Costs of transportation. Origin warehouse costs. Logistic cost model for maritime transport. BPD technologies in logistics. Business process reengineering. Case studies

1.5. Teaching methods	☒ lectures ☐ seminars and workshops ☒ exercises ☐ long distance education ☐ fieldwork	☒ individual assignment ☐ multimedia and network ☒ laboratories ☒ mentorship ☐ other

1.6. Comments

1.7. Student's obligations

Students must be active and participate in class activities

1.8. Evaluation of student's work

Course attendance	0,5	Activity/Participation	0,5	Seminar paper	1	Experimental work	
Written exam	1	Oral exam		Essay		Research	2
Project		Sustained knowledge check		Report		Practice	
Portfolio							

1.9. Assessment and evaluation of student's work during classes and on final exam

1.10. Assigned reading (at the time of the submission of study programme proposal)

"The internationalization processes of freight transport companies" Susanne Hertz EFI, The economic research institute, Stockholm school of economics, 1993.
"The logistic handbook" – Robersiopn, Capacino, The Free press, Maxwell Macmillan International,1994.
TRILOG – EU and report – Study Contract Nr. R 98/98/SIN001257 – B6 – 792013, TNO Inro (NL),1999.
Intermodality And Intermodal Freight Transport In The European Union – Communication From The Commission To The European Parliament And The Council

1.11. Optional / additional reading (at the time of proposing study programme)

Trade and Transport Logistics Facilitation Guidelines Carlos T. de Castro – The World Bank SSATP Working Paper No 4.
Virtual logistics An introduction and overview of the concepts, Mike P. Clarke, International Journal of Physical Distribution & Logistics Management, Vol. 28 No. 7., 1998, pp. 486 – 507.

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

Title	*Number of copies*	*Number of students*

1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Periodical evaluation and assessment of students and teachers is foreseen in order to provide continuous improvement of teaching quality. During the last week of classes, a poll will be conducted, where students would evaluate the quality of classes. Students' achievements will be analyzed.

Basic description		
Course coordinator		
Course title	DECISION SUPPORT SYSTEMS	
Study programme	**INFORMATICS**	
Course status	compulsory	
Year	II	
ECTS credits and teaching	ECTS student 's workload coefficient	5
	Number of hours (L+E+S)	**30+0+30**

1. COURSE DESCRIPTION

1.1. Course objectives

The main course objectives are to learn how to build a decision support system, analitical processing system (OLAP), data warehose and business inteligence system.

1.2. Course enrolment requirements

The couse corresponds to the topics covered in Inteligent Systems and Data Base couses.

1.3. Expected course learning outcomes

The students will be able to use the knowledge of decission support systems, data warehousing, analitical processing and business intelignece in real business case situation.
The students will be qualified in the field of dimensional data modelling and in metodology of development business inteligence systems. Students will be capable of describing basic iideas in analiticall procesing and use of data mining for businnes inteligence.

1.4. Course content

Decision making process. Individual and group decision making.
Elements of decision support systems arhitecture. Developing decision support systems. Methods and tools for DSS development.
Analitical information system. Difference betwen analitical and transactional information systems. A reason for development of analitical IS.
Data warehouse. The spiral metodology of data warehouse development. Dimensional modeling.
Multidimensional analitical processing. Data visualisation
Knowledge discovery. Output knowledge representation. Connection with knowledge management systems.

1.5. Teaching methods	☒ lectures ☒ seminars and workshops ☒ exercises ☐ long distance education ☐ fieldwork	☐ individual assignment ☐ multimedia and network ☐ laboratories ☐ mentorship ☒ other ---tutorial

1.6. Comments

1.7. Student's obligations

Students should actively participate in all forms of works, produce a seminar paper on business inteligence system and pass the written exam.

1.8. Evaluation of student's work

Course attendance	1	Activity/Participation		Seminar paper		Experimental work	

Written exam	2	Oral exam		Essay		Research	2
Project		Sustained knowledge check		Report		Practice	
Portfolio							

1.9. Assessment and evaluation of student's work during classes and on final exam

1.10. Assigned reading (at the time of the submission of study programme proposal)

Larissa Moos, Shaku Atre, Business Intelligence Roadmap: The Complete project Lifecycle for Decision Support Applications, Addison Wesley, 2003.
Turban, E., Aronson, J., *Decision Support Systems And Intelligent Systems*, Prentice Hall, Englewood Cliffs, N.J., 1998.
E. Thomsen: OLAP Solutions, Building Multidimensional Information Systems; John Wiley & Sons; Canada, 1997.

1.11. Optional / additional reading (at the time of proposing study programme)

W. H. Inmon: Building the Data Warehuse; 4th edition, John Wiley & Sons; Canada, 2005.
R. Kimball et al.: The Data Warehouse Lifecycle Toolkit, Expert Methods for Designing, Developing and Deploying Data Warehouses; John Wiley & Sons; Canada, 1998.
Ian W. Witten Data Mining, 2nd edition, Practical machine lerning tools and techniques,Morgan Kaufmann, 2005.

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

Title	*Number of copies*	*Number of students*

1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

During the last week of classes, a poll will be conducted, where students would evaluate the quality of classes. Students' achievements will be analyzed.

Basic description		
Course coordinator		
Course title	NATURAL LANGUAGE PROCESSING	
Study programme	**INFORMATICS**	
Course status	compulsory	
Year	II	
ECTS credits and teaching	ECTS student 's workload coefficient	6
	Number of hours (L+E+S)	**30+0+30**

1. COURSE DESCRIPTION

1.1. COURSE OBJECTIVES

The main course objective is an introduction to natural language processing and computational linguistics.

1.2. Course enrolment requirements

The course program is in correlation with the program of the courses: Formal languages and Compilers and Intelligent systems.

1.3. Expected course learning outcomes

Students are expected to acquire the basic knowledge of the principles and possibilities of

- Development of: language resources, corpora, statistical lenguage models, syntax and semantic model of language, morphological analysis, part-of-speech tagging, automatic indexing, machine aided translation and information retrieval.
- to define and explain procedures in natural language processing and computational linguistics,

and use procedures and algorithms for processing of natural languge.

1.4. Course content

Introduction. What is NLP? Computational linguistics and language technologies. Language resources, corpora, lexicons and dictionaries.
Probabistic models of prunounciation and spelling. N-grams. Perplexity.
Syntax models. Morfolology analyzer. Part of speech tagging. Parsing with Context-free grammars. Semantic analysis. Representing meaning. Lexical semantics. Pragmatics. Discourse. Dialogue and conversational agents. Natural language generation.
Language identification. Computer aided translation. Machine translation. Information Retrieval.

1.5. Teaching methods	☒ lectures ☒ seminars and workshops ☒ exercises ☐ long distance education ☐ fieldwork	☐ individual assignment ☐ multimedia and network ☐ laboratories ☒ mentorship ☐ other --- tutorials

1.6. Comments

1.7. Student's obligations

It is compulsory for students to attend exercises. A student has to pass the written (practical) part of the examination which regards the exercises and after a research work to prepare a seminar paper and a project.

1.8. Evaluation of student's work

Course attendance	1	Activity/Participation		Seminar paper	1	Experimental work	
Written exam	1	Oral exam		Essay		Research	

Project		Sustained knowledge check	1	Report		Practice	
Portfolio				Fale 2			

1.9. Assessment and evaluation of student's work during classes and on final exam

1.10. Assigned reading (at the time of the submission of study programme proposal)

D. Jurafsky, J. H. Martin: Speech and Language Processing, An Intoduction to Natural Language Processing, Computational Linguistics and Speech Recognition, Prentice Hall, 2000.
C. Manning, H.Schütze: Foundations of Statistical NLP, MIT Press, Cambridge, Massachusetts, 1999.

1.11. Optional / additional reading (at the time of proposing study programme)

Srbljić Siniša: Uvod u teoriju računarstva. Element, Zagreb 2007.

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

Title	*Number of copies*	*Number of students*

1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Annonimus poll in the end of semester. Statistical reports on results obtained on quizies, partial exams, homeworks and final project. In the end statistical report on passing.

Basic description		
Course coordinator		
Course title	E-LEARNING	
Study programme	**INFORMATICS**	
Course status	compulsory	
Year	II	
ECTS credits and teaching	ECTS student 's workload coefficient	6
	Number of hours (L+E+S)	30 0 + 30

1. COURSE DESCRIPTION

1.1. Course objectives

In the context of this course the students acquire basic theoretical knowledge about e-learning. The students are trained to implement information and communication technologies (ICT) in education and to use other e-learning approaches including distance learning.

1.2. Course enrolment requirements

Multimedia and hypermedia systems.

1.3. Expected course learning outcomes

Upon completion of course, students will be able to do the following:

1. identify various types of ICT and approaches of ICT use for teaching and learning
2. define e-learning and classify different types of e-learning
3. analyze different approaches to e-learning in order to decide which is the most appropriate for the course

distinguish the types of online communication and implement them in education

1.4. Course content

E-learning and distance learning and education: definition, advantages, disadvantages, types, technologies, methodologies. Mix-mode approach to e-learning. Recommendations for organizing teaching and communication in online courses. Synchronous and asynchronous communication: tools and their usage in education.

Using ICT as aids for traditional f2f teaching, and for distance education. The role of information science expert in enhancing informatics courses and using ICT in education in general. Modern ICT and their role for e-learning.

1.5. Teaching methods	☐ lectures ☐ seminars and workshops ☐ exercises ☒ long distance education ☐ fieldwork	☐ individual assignment ☒ multimedia and network ☐ laboratories ☐ mentorship ☐ other
1.6. Comments	During exercises the students analyze e-learning courses and programmes on WWW. A part of the course is implemented online in order to give the students an example of such learning approach.	

1.7. Student's obligations

In order to acquire required number of ECTS credits, students should attend the classes, actively participate in all forms of works (including e-learning by using LMS), perform practical exercises, produce seminar papers,

and pass the final exam consisting of written and oral part.

1.8. Evaluation of student's work

Course attendance	0,5	Activity/Participation	1	Seminar paper	1	Experimental work	
Written exam	1	Oral exam	1	Essay		Research	
Project		Sustained knowledge check	0,5	Report		Practice	
Portfolio				Fali 1			

1.9. Assessment and evaluation of student's work during classes and on final exam

1.10. Assigned reading (at the time of the submission of study programme proposal)

Online textbook
Horton, W. (2000). Designing Web-Based Training. New York: John Wiley & Sons, Inc.

1.11. Optional / additional reading (at the time of proposing study programme)

Porter, L. (1997). *Creating the Virtual Classroom.* New York: John Wiley & Sons, Inc.
Alessi, S., Trollip, S. (2000). Multimedia for Learning: Methods and Development (3rd Edition), Allyn & Bacon

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

Title	*Number of copies*	*Number of students*

1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

During the last week of classes, a poll will be conducted, where students would evaluate the quality of classes. Students' achievements will be analyzed.

GOTOVO

4.3 STRUCTURE OF STUDY, RHYTHM OF STUDY , STUDENT'S OBLIGATIONS

IV. YEAR								
	VII. term hours/week			VIII term hours/week			Total hours per term	ECTS credit
COURSE	P	S	V	P	S	V		
Intelligent Systems 1	2	-	2				60	6
Operations Research 1	2	-	2				60	6
Modul BI								
Software Engineering	2	-	2				60	6
Business Economics	2	-	2				60	6
Elective Course (ICS program)	2	-	2				60	6
Modul ICS								
Distributed Systems	2	-	2				60	6
Object-Oriented Programming Languages	2	-	2				60	6
Elective Course (BI program)	2	-	2				60	6
Total VII. term	**10**		**10**				**300**	**30**
Intelligent Systems 2				2	-	2	60	6
Operations Research 2				2	-	2	60	6
Modul BI								
Selected Topics in Databases				2	-	2	60	6
Electronic Commerce				2	-	2	60	6
Elective Course (ICS program)				2	-	2	60	6
Modul ICS								
Multimedia and Hypermedia Systems				2	-	2	60	6
Intoduction to Digital Speech and Image Processing				2	-	2	60	6
Elective Course (BI program)				2	-	2	60	6
Total VIII. term				**10**		**10**	**300**	**30**
TOTAL 4. YEAR:	**10**		**10**	**10**		**10**	**600**	**60**

V. YEAR								
	IX. term hours/week			**X term hours/week**			**Total hours per term**	**ECTS credit**
COURSE	**P**	**S**	**V**	**P**	**S**	**V**		
Communication Skills	1	-	1				30	2
Master's Thesis Seminar	-	2	-				30	4
Modul BI								
Management	2	-	2				60	6
Information Technology Project Management OR * Organization's Information System	2	-	2				60	6
Elective Course (ICS program)	2	-	2				60	6
Elective Course	2	-	2				60	6
Modul ICS								
Network Systems Management	2	-	2				60	6
Human-Machine Communication	2	-	2				60	6
Knowledge Discovery and Data Mining OR Knowledge Management	2	-	2				60	6
Elective Course	2	-	2				60	6
Total IX. term:	**9**	**2**	**9**				**300**	**30**
Information Technology and Society				2	-	2	60	5
Thesis								10
Modul BI								
Strategic Planning of Information Systems				2	-	2	60	5
Logistics				2	-	2	60	5
Elective Course (ICS program) OR * Elective Course (EF, TF, MF)				2	-	2	60	5
Modul ICS								
Natural Language Processing				2	-	2	60	5
Decision Support Systems or * e-learning				2	-	2	60	5
Elective Course (BI program) OR Elective Course (EF, TF, PF))				2	-	2	60	5
Total X. term:				8		**8**	**240**	**30**
TOTAL 5. YEAR:	**9**	**2**	**9**	**8**		**8**	**540**	**60**

* Students choose one of two electives.

4.4 THE PROFESSORS AND ASSOCIATES

No	Course	Professor
1.	Operation Research 1	dr. sc. Marija Marinović
2.	Intelligent Systems 1	dr. sc. Velimir Topolovec, dr. sc. Maja Matetić
3.	Software Engineering	dr.sc. Mile Pavlić
4.	Business Economics	dr.sc. Ante Bistričić
5.	Network Systems Management	dr. sc. Mario Radovan
6.	Object-Oriented Programming Languages	dr. sc. Mario Radovan
7.	Intelligent Systems 2	dr. sc. Maja Matetić
8.	Operation Research 1	dr. sc. Marija Marinović
9.	Selected Topics in Databases	dr.sc. Mile Pavlić
10.	Electronic Commerce	dr.sc. Dragan Čišić
11.	Multimedia and Hypermedia Systems	dr. sc. Nataša Hoić-Božić
12.	Intoduction to Digital Speech and Image Processing	dr.sc Ivo Ipšić
13.	Communication Skills	dr.sc. Ingrid Brdar
14.	Management	dr.sc. Ante Bistričić
15.	Information Technology Project Management	dr. sc. Božidar Kovačić
16.	Organization's Information System	dr. sc. Mile Pavlić
17.	Distributed Systems	dr. sc. Božidar Kovačić
18.	Human-Machine Communication	dr.sc. Ivo Ipšić
19.	Knowledge Discovery and Data Mining	dr. sc. Maja Matetić
20.	Knowledge Management	dr.sc. Ljupčo Todorovski
21.	Information Technology and Society	dr. sc. Mario Radovan
22.	Strategic Planning of Information Systems	dr. sc. Željko Dobrović
23.	Logistics	dr.sc. Dragan Čišić
24.	Decision Support Systems	dr. sc. Velimir Topolovec
25.	Natural Language Processing	dr.sc. Ivo Ipšić
26.	e-learning	dr. sc. Nataša Hoić-Božić

Employees of the Department of Informatics.
dr. sc. Mario Radovan, red. prof.
dr. sc. Velimir Topolovec, red. prof.
dr. sc. Marija Marinović, red. prof.
dr. sc. Ivo Ipšić, red. prof.

dr.sc. Mile Pavlić, izv. prof.
dr.sc. Nataša Hoić-Božić, doc.
dr. sc. Maja Matetić, doc.
dr. sc. Božidar Kovačić, doc.
dr.sc. Patrizia Poščić, viši asistent
dr.sc. Sanda Martinčić-Ipšić viši asistent
mr.sc. Marina Ivašić-Kos, asistent
mr.sc Ana Kaić, asistent
mr.sc Sanja Čandrlić, asistent
Igor Jugo, prof.
Marija Brkić, prof.
Martina Holenko, prof.
Miran Pobar, dipl.ing.
Vedran Strčić, prof.

Guest profesors:
dr.sc. Nikola Pavešić, red. prof.
dr.sc. Ingrid Brdar, izv. prof
dr.sc. Dragan Čišić, izv. prof.
dr.sc. Ante Bistričić, doc.
dr.sc. Željko Dobrović, doc.
dr.sc. Ljupčo Todorovski, doc.

4.5 CURRICULUM VITAE

First and last name:	Mario Radovan
E-mail:	mradovan@inf.uniri.hr
Personal web page address:	http://www.inf.uniri.hr/~mradovan/
Institution of employment:	University of Rijeka, Department of Informatics, Omladinska 14, 51000 Rijeka, Croatia
Present teaching position:	Full professor with permanent appointment
Last date of election:	23.09.2004

Curriculum vitae

Mario Radovan graduated in computer science, received master degree in operational research, and doctoral degree in information sciences. He published 58 scientific works in Croatia and abroad, among which also three books: *Programming in Prolog*, *Information systems design*, *Data bases: relational approach and SQL*. He was appointed as a full professor in information sciences in 1999 ("Data bases", "Communication systems and society") and he became a full professor with permanent appointment in 2004 ("Computer networks", "Communication systems and society"). He taught or teaches several courses: "Information systems design", "Data bases and communication systems", "Communication systems and society", "Computer networks", "Programming for the Internet", "Information technology and society". In the academic year 1985/86 he was a visiting scholar at the New University of Lisbon (Portugal), and he spent the academic year 1997/98 at the University of California at Berkeley as a visiting scholar and a receiver of the Fulbright Senior scholarship.

List of relevant publications

Radovan, M.: *Computer Networks*, 2007. (digital course material, 287 pages; the material is renewed every year; in Croatian language).

Radovan, M.: *Programming for the Internet*, 2008. (digital course material, 272 pages; the material is renewed every year; in Croatian language).

Radovan, M.: *Information technology and society*, 2007. (digital course material, 148 pages; the material is renewed every year; in Croatian language).

Jugo, I.; Radovan, M.: "New Technologies for Web Applications", in the Proceedings of the *18th International Conference on Information and Intelligent Systems*, Varaždin, Croatia, September 12-14, 2007, pp. 193-198.

Radovan, M.: "Towards a surveillance society", *Ekonomska istrazivanja*, Vol. 19 (2006), No. 2, pp. 40-51.

Radovan, M., Jugo, I: "On data gathering and surveillance", in the Proceedings of the *17th International Conference on Information and Intelligent Systems*, Varaždin, Croatia, September 20-22, 2006, pp. 435-440.

Jugo, I., Radovan, M.: 'Developing Dynamic Web Applications', in Proceedings of the *15th International Conference on Information and Intelligent Systems*, Varaždin, Croatia, September

22-24, 2004, pp. 101-110. (English)

Radovan, M.: 'The Information Society: A Sketch for Portrait', in Proceedings of the International Conference *Information Technology Interfaces*, Cavtat, Croatia, June 16-19, 2003, pp. 359-365. (English)

Radovan, M.: 'Homo Cybernetes: In Search of an Aim', *Synthesis Philosophica*, Vol. 17 (2002), No 2, pp. 381-391 (English)

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Radovan, M.: 'Integrity in the Relational Data Model', *Informatica; An International Journal of Computing and Informatics*, Vol. 16 (3), 1992., pp. 17-25. (English)

Radovan, M.: *Information Systems Design*, Informator, Zagreb, 1989., 1991; book, 169 pp. (Croatian)

Radovan, M.: *Programming in Prolog*, Informator, Zagreb, 1987., 1988., 1990; book, 159 pp. (Croatian)

Other qualifications for course performing

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Present teaching position:	Full professor with permanent appointment
Last date of election:	23.09.1990

Curriculum vitae

.

List of relevant publications

Topolovec, V.: Planiranje, uvođenje i korištenje CASE-a, Zbornik radova savjetovanja CASE-3, Opatija, 1991, str. 17.1-17.7.
KATEGORIJA RADA = A.1.7.
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KATEGORIJA RADA = A.1.2.
Topolovec, V.: Strateško planiranje, uvođenje i korištenje informacijske tehnologije u organizaciji, Informatologija, Vol.24, Br. 2, Zagreb, 1992, 47-67.
KATEGORIJA RADA = A.1.5.
Gradečki, M., Poštenjak, K., Topolovec, V.:Some phenotypic characterictics of English oak in registered seed stands in Croatia,Proceedings of the Centernial Meeting Union of Forestry Research Org.,Eberswalde/Berlin,September 1992,272-273.
KATEGORIJA RADA = A.1.6.
Gradečki, M., Poštenjak, K., Topolovec, V.:Analiza nekih kvalitativnih osobina sjemena hrasta lužnjaka iz sjemenskih sastojina u Hrvatskoj,"Radovi" Šumarskog instituta,Vol. 28,Br. 1-2,Jastrebarsko,1993,37-54.
KATEGORIJA RADA = A.1.3.
Topolovec, V., Varga, M., Kermek, D.:Inteligentni integrirani informacijski sustavi uredskog poslovanja-IIISUP, IV. međunarodni simpozij "Informacijske i komunikacijske tehnologije u uredskom poslovanju" '93., Zbornik sažetaka,Varaždin,28-29. listopad 1993.,str. C: 25-27.
KATEGORIJA RADA = A.1.6.
Topolovec, V., Brumec, J.:Faktori uspješnosti informacijske tehnologije u uredskom poslovanju, IV. međunarodni simpozij "Informacijske i komunikacijske tehnologije u uredskom poslovanju" '93.,Zbornik sažetaka,Varaždin,28-29. listopad 1993., str. D: 25-27.
KATEGORIJA RADA = A.1.6.
Zver, B., Topolovec, V., Kozina, M.:Strateško planiranje automatizacije uredskog poslovanja, IV. međunarodni simpozij "Informacijske i komunikacijske tehnologije u uredskom poslovanju" '93., Zbornik sažetaka, Varaždin, 28-29. listopad 1993., str. C: 33-35.
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Kozina, M., Topolovec, V.:Taksonomija informacijskih sustava: analiza i interpretacija, V. međunarodni simpozij Informacijski sustavi '94, Zbornik radova, Varaždin 12-13. prosinac 1994., sekcija 1, str.II:1-11.
KATEGORIJA RADA = A.1.6.
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KATEGORIJA RADA = A.2.1.
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KATEGORIJA RADA = A.1.5.
Topolovec,V.: Informacijski sustavi za podršku rukovođenju, I. Međunarodni znanstveni simpozij KOMUNIKACIJSKI SUSTAVI `96, Zagreb, 24. svibnja 1996., Informatologija Vol. 28, br.3-4 . U štampi
KATEGORIJA RADA = A.1.5.
Topolovec,V.,Rosić, V.,: Integracija informacijske tehnologije i obrazovanja, II. Međunarodni znanstveni simpozij KOMUNIKACIJSKI SUSTAVI`97, Zagreb, 30. svibnja 1997., Informatologija Vol. 29, br1-2 . U štampi.
KATEGORIJA RADA = A.1.5.
Topolovec,V., Rosić,V.,: Kvaliteta učenja i informacijska tehnologija, III. Međunarodni znanstveni simpozij KOMUNIKACIJSKI SUSTAVI `98, Zagreb, 4. lipnja 1998., Informatologija Vol. 29, br.3-4 . U štampi.
KATEGORIJA RADA = A.1.5.
Topolovec,V.: Objektno-orijentirana, klijent-server Internet okolina i obrazovanje, III. Međunarodni znanstveni simpozij KOMUNIKACIJSKI SUSTAVI `98, Zagreb, 4. lipnja 1998., Informatologija Vol 29, br.3-4 . U štampi.
KATEGORIJA RADA = A.1.5.
Topolovec,V., Rosić,V., Pavlić,M.,: Informacijska tehnologija i njen utjecaj na obrazovanje, Međunarodni znanstveni skup DRUŠTVO I TEHNOLOGIJA 98, Opatija 27.-28. lipnja 1998., Zbornik radova, str.100-111.
KATEGORIJA RADA = A.1.6.
Topolovec,V., Rosić,V.,: Informacijska tehnologija i kvaliteta obrazovanja, Međunarodni znanstveni skup KVALITETA U ODGOJU I OBRAZOVANJU, Rijeka 19.-20. veljače1998., Zbornik radova, str.459-468.

KATEGORIJA RADA = A.1.6. Gradečki,M., Poštenjak,K., Topolovec,V.:Natural reforestation of peduncled oak forests in Croatia "yesterday-today-tomorrow", Proceedings "Advances in research in intermediate oak stands" IUFRO - Group P1.06, Freiburg 1997., pp.98-107. KATEGORIJA RADA = A.1.6
Other qualifications for course performing

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Present teaching position:	Full professor
Last date of election:	23.09.2004

Curriculum vitae

Education:

Ph.D. degree

- November, 1988. Title of the thesis: " Invariants in Relation Petri Nets"
- 1985-1988, the Ph.D. study in Operational Research at the Faculty of Economics, University of Ljubljana, Slovenia

Master degree

- May 1985. Title of the thesis: "Simulation of bysness systems by Petri Nets"
- 1982-1985; the master study in Operational Research at the Faculty of Economics, University of Ljubljana, Slovenia

Bachelor degree

- Mart, 1973 at the Faculty of High Industry-Pedagogic School, Rijeka, Croatia, section of mathematics and physics.

Professional Experience:

- 1973-1975-professor of Math and Physic at Health and Pedagogic School, Rijeka
- 1975-1985-assistant of Mathematics at Faculty of Industrial Pedagogic,Rijeka, University of Rijeka
- 1985-1990-assistant of Information Science at the Faculty of Philosophy, Department of Informatic, Rijeka, University of Rijeka
- 1990-1996- assistant professor of Operational Research and Information Science at the Faculty of Philosophy, Department of Informatic, Rijeka, University of Rijeka
- 1997- associate professor of Operational Research and Information Science, at the Faculty of Philosophy, Department of Informatic, Rijeka, University of Rijeka
- 2004- full professor of Operational Research and Information Science, at the Faculty of Philosophy, Department of Informatic, Rijeka, University of Rijeka

Fields of interest:

(1) Operational Research: Quantitative methods for decision making. The scope of operational research is to model mathematically the real situations and processes in order to undertake a optimal decision for obtaining the objective that interests us.

(2) Introduction information technology in theory and practice of pedagogical education"

Other Activities:

- Member of the Mathematical Society-Rijeka
- Member of the Croatian Operational Research Society
- Member of the Slovenian Operational Research Society

- Member of Croatian Cybernetic Society

List of relevant publications

Marinović, M.: *Costs Optimization of an Economic Subject*, Proceedings of Symposium on Operational Research '99, Preddvor, Slovenia, 1999., ISBN 961-6165-08-9, pp. 191-197.

Marinović, M., Baćac, N.: *High education trend in the use of information literacy and Internet*, Proceeeding of 11th International Conference on Information and Intelligent Systems (CD), september 20th – 22nd, 2000., Varaždin, Croatia, 2000.

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Marinović, M., Katić, V.: *Computers in preschool education*, Proceedings of the conference, MIPRO 2001, Computers in education, CE, Opatija, Croatia, May, 2001., ISBN 953-6104-32-6 pp. 16-19.

Marinović, M.: *Operational Research at the Faculty of Philosophy in Rijeka*, Proceedings of Symposium on Operational Research '01, Preddvor, Slovenia, 2001., ISBN 961-6165-12-7, pp. 349-353.

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Lustig-Korin, A., Čičin-Šain, M.,Marinović, M.: *Introducing GIS and hypermedia applications to business students*, Informatologia, 36, 2003., 2, 83 -165, ISSN 1330-0067, pp. 105-112.

Čičin-Šain, M., Marinović, M.: *Using Solver to determine maximum profitability*, Proceedings of Symposium on Operational Research '03, Podčetrtek, Slovenia., 2003., ISBN 961-6165-15-1, pp. 349-353.

Čičin-Šain, M, Marinović M.: *A methodical approach to linear programming problems*, Proceeeding of 14th International Conference on Information and Intelligent Systems (Editors: Boris Aurer and Dragutin Kermek), september 24 – 26, 2003. Varaždin, ISBN 953-6071-22-3, Croatia, pp. 49-55.

Pavlić, M., Dobrović, Ž., Marinović M.: *Modelling the data collection process in the strategic IS/IT planning phase*, Informatologia, 36, 2003., 4, 242-332, ISSN 1330-0067, pp. 302-309.

Milena Sošić, Marija Marinović: *Repetitorij s riješenim zadacima iz matematike*, Sveučilište u Rijeci, Filozofski fakultet, 2004., str. 370, ISBN 953-6104-42-3.

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Curriculum vitae

Ivo Ipšić was born in 1963. He received the B.Sc., M.Sc. and Ph.D. degrees in electrical engineering from the Faculty of Electrical Engineering, University of Ljubljana, Slovenia in 1988, 1991 and 1996, respectively. From 1988 to 1998 he was a staff member of the Laboratory for Artificial Perception, at the Faculty of Electrical Engineering, University of Ljubljana. In the academic year 93/94 Ivo Ipšić was a guest researcher at the Friedrich Alexander University of Erlangen-Nuernberg, Germany, at the Department of Computer Science. His work concerned acoustic modelling for continuous speech recognition. Since 1998 Ivo Ipšić is a professor of computer science at the University of Rijeka, Croatia. His current research interests belong to the field of pattern recognition, digital signal processing and artificial intelligence. Ivo Ipšić is author of more than 50 papers presented at international conferences or published in international journals.

List of course relevant publications:

1. F. Mihelič , I. Ipšić, S. Dobrišek i N. Pavešić. *Feature Representations in Classification Procedures for Slovenian Phone Recognition*. Pattern Recognition Letters, 12(12):879--891, 1992.
2. Ipšić, F. Mihelič i N. Pavešić. *Analysis of different dialog strategies in the Slovenian spoken dialog system*. Text, speech and dialogue : second international workshop, TSD'99, Plzen, Czech Republic, September 13-17, 1999 : Lecture notes in computer science, Lecture notes in artificial intelligence, vol. 1692, Vaclav Matoušek, ur., Pavel Mautner, ur., Jana Ocelikova, ur., Petr Sojka, ur., Berlin [etc.], Springer, cop. 1999, str.315-320.
3. I. Ipšić. Matematičko modeliranje govora i jezika. Modeliranje u znanosti, tehnici i društvu (četvrti dio) Kreativno rješavanje zadataka. Božičević, Juraj; Caharija, Alojz (ur.). Zagreb : Akademija tehničkih znanosti Hrvatske, 2000, str. 17-23.
4. I. Ipšić, N. Pavešić. Uporaba prikritih Markovih modelov pri segmentaciji govornega signala. Elektrotehniški vestnik, 56(2):315--319, 1989.
5. E. Nőth, S. Harbeck, H. Niemann, V. Warnke i I. Ipšić. Language Identification in the Context of Automatic Speech Understanding. Journal of Computing and Information Technology CIT, Vol. 4, No. 1, str. 1--8, 1996.
6. Ipšić i N. Pavešić. An Overview of the Slovenian Spoken Dialog System. Journal of Computing and Information Technology CIT, Vol. 10, No. 4, str.295-301, 2002.
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8. Martinčić-Ipšić, Sanda, Žibert, Janez, Ipšić, Ivo, Mihelič, France, Pavešić,Nikola. Bilingual Speech Recognition for Weather Information Retrieval Dialog System. Matoušek, Vaclav, (ed.), Mautner, Pavel, (ed.). 6th International Conference on Text, Speech and Dialogue, TSD 2003, Česke Budejovice, Czech Republic, September 8-12, 2003: proceedings, Lecture notes in computer science, Lecture notes in artificial intelligence, vol. 2807. Berlin [etc.]: Springer, cop. 2003, p. 380-387.
9. Maja Matetić, Slobodan Ribarić, Ivo Ipšić**.** *Qualitative Modelling and Analysis of Animal Behaviour*. Applied Intelligence, Volume 21., No.1., str.25-44, 2004.

10. Martinčić-Ipšić, Sanda; Matešić, Mihaela; Ipšić, Ivo. Korpus hrvatskog govora. Govor : časopis za fonetiku. I (2004) , 2; 135-150.
11. Martinčić-Ipšić, Sanda, Ipšić, Ivo *Croatian HMM Based Speech Synthesis*. Journal of Computing and Information Technology, CIT, Vol. 14(4). pp. 299-305. 2006.
12. Martinčić–Ipšić, Sanda, Ribarić, Slobodan, Ipšić, Ivo, Acoustic Modelling for Croatian Speech Recognition and Synthesis, Informatica. Vol. 19(2), pp.227-254. 2008.

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Short biography:

MILE PAVLIĆ was born on April 10, 1956 in Lovas, Vukovar, Croatia. He got his B.A. in Physics / Mathematics at the Faculty of Arts and Sciences in Rijeka in 1980.
He has more than 23 years of work experience, and in that period he worked on the following:

- Assistant in Physics at the Institute "Ruđer Bošković" from 1980 to 1982.
- Analysist / Programmer in the Programming Department at the Shipyard "3. Maj" in Rijeka from 1982 to 1989.
- System Designer and Director of the Computer department at the "RiAdria" bank in Rijeka from 1989 to 1993.
- Professor in the Computer Sciences department at the Faculty of Arts and Sciences in Rijeka from 1993.

He published 6 books and 4 scripts.
Received a gold medal for his prominent contributions to the development and popularization of the Computer Sciences in Croatia in 1987.
The Croatian Informatics Community rewarded him with the "Informatics Plaquette '93" for the development and popularization of the Information Technology professions in Croatia.

A list of books used for teaching:

BOOKS:

Pavlić, M., " Uvod u FORTRAN 77 za velika i PC računala" (interno za potrebe poduzeća 3. «maj» 1986. godine),
Pavlić, M., "Sistem analiza i modeliranje podataka", Naučna knjiga, Beograd, 1990. 5 chapters, 256 pages, 68 images, 16 tables.
Strahonja, V., Varga, M., Pavlić, M., "Projektiranje informacijskih sustava (metodološki priručnik)", ZID i INA - INFO, Zagreb, 1992. 13 chapters, XI+340 pages, 166 images.
Srića, V., Pavlić, M., Treven, S., "Menedžer i informacijski sustavi - sve što bi menedžeri trebali znati o informatici", Poslovna knjiga, Zagreb, 1994. 3rd chapter + appendix, 90 pages.
Srića, V., Treven, S., Pavlić, M., "Informacijski sistemi", Gospodarski vestnik, Ljubljana, Slovenija, 1995. 3rd chapter in the book (from page 180 to page 268), 13 images.
Pavlić, M., "Razvoj informacijskih sustava - projektiranje, praktična iskustva, metodologija", Znak" Zagreb, 1996., 4 chapter and appendix, 361 pages, 205 images, 93 tables.

Other teaching qualifications

Mile Pavlić, Ph.D. has been working as a teacher at the Faculty of Arts and Sciences in Rijeka from 1989 to 1993. He held the following courses for the Mathematics and Computer Sciences study group: "Signal analysis and modeling", "Data structure and

organization" and "Information Systems Design".
From 1993 to the present day he teaches the following courses: "Information Systems", "Data modeling", "Process Modeling" and "Databases". He managed to increase the total percentage of CS-related lecturing hours from 28% to 50% in the combined study groups (a study group in which there are two major subjects, for example Computer Sciences + English Language and Literature). He initiated the forming of a single-major Computer Science Study Group, the goal of which is to produce professionals capable of developing complex business software, not only future teachers.
He designed the lectures for the following subjects: "Information systems", "Data and process modeling", "Databases and CASE tools", "The information system of an organization", "Information system modeling and analysis".
He wrote a book for the course "Data and process modeling". His monograph "The Development of Information Systems" is widely used in a large number of undergraduate and post-graduate studies, and also as a handbook in many software companies.
He was principal of the Computer Sciences Department at the Faculty of Arts and Sciences in Rijeka from 1995 to 1998, and founded the "Information Systems Department" at the same faculty.
He has been holding seminars for adult professional in the field of information systems engineering and design from 1986 to the present. More than 1000 people completed his seminars, many of them coming from some of the Croatian largest companies, such as: HRT (the Croatian National Television), PLIVA (a Croatian pharmaceutical company), HOO (Croatian Olympic Board), HIZ (the Croatian IT Community), MORH (the Croatian Ministry of Defense), HPT (a Croatian telecommunications company), the shipyard «3.Maj», the Employment Agency of Croatia, the Croatian banks "Varaždinska banka", "Privredna banka" and "Hrvatska banka za obnovu i razvitak", the Faculty of Arts and Sciences, and for Croatian companies such as "Bilokalnik", "PULSAR – Split", "INTEGRA – GROUP – Zagreb", "TEMPO – Zagreb", "Poslovni software – Split", "AD Plastik – Split", "SYS", "Petrokemija Kutina" etc.

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Curriculum vitae

Nataša Hoić-Božić was born in 1967 in Rijeka. She studied at the Faculty of Education, University of Rijeka and she received the B.Sc. degree in Mathematics and Information Science in 1990.

She received M.Sc. degree in Computer Science at the Faculty of Computer and Information Science, University of Ljubljana, Slovenia in 1997 and Ph.D. degree in Computer Science in 2002 at the Faculty of Electrical Engineering and Computing, University of Zagreb, Croatia (Ph.D. theses: "Adaptive Hypermedia Courseware.")

She worked as an information system planner from 1990-1992. She is working as assistant professor at the Department of Information Science, Faculty of Philosophy, University of Rijeka on the following courses: "Multimedia Systems", "Seminar on Hypermedia", and "Teaching Methods in Information Science." As a teaching assistant she conducted the practical part of the course "Computer Networks". At the Faculty of Engineering, University of Rijeka she is teaching the course "Computer Networks". For these courses she has developed WWW learning materials.

As a research assistant she worked on the projects "Innovations in Computer Assisted Education (1993-1997)", "The Quality of Teaching in Higher Education (1997-2000)", and "Adaptive Hypermedia Courseware (2002-2003)", supported by Croatian Ministry of Science and Technology.

Currently she is researcher on the project "Computing Support to Education (2003-)".

She was the head of the project "Teaching Methods in Information Science Online (2004-2006.)".

She received research grants for the projects "Developing the Educative WWW Hypermedia Applications" (project of the OSI Croatia, 1996-97) and "Transforming Information into Knowledge: Online Courses in Education (Research Support Scheme of the Open Society Support Foundation, 1998-2000).

She has been participated in several research projects conducted by Croatian Academic and Research Network – CARNet as a member of project teams. She is a member of project team of the TEMPUS UM_JEP-19105-2004 project "EQIBELT - Education Quality Improvement by eLearning Technology", Coordinating Institution: University of Zagreb University Computing Centre (SRCE), (2005-)

Her main research interests include e-learning or information and communication technology in education, especially hypermedia and Internet in education.

She actively uses English in reading, writing and conversation.

She attended a number of scientific conferences and has authored or co-authored a number of scientific papers.

List of relevant publications

N. Hoić-Božić, WWW learning materials for the courses *Teaching Methods in Information Science*, *Multimedia systems*, and *Hypermedia systems* (prepared for LMS AHyCo, http://ahyco.ffri.hr/ahyco/), and *Computer networks* (http://ahyco.ffri.hr/ritehMreze/)

E-learning portal on AHyCo.ffri.hr

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N. Hoić-Božić, V. Mornar, *Navigation Support in a Web-Based Adaptive Educational Hypermedia System*, Proceedings of AMCIS 2001 - Seventh Americas Conference on Information Systems, Boston, Massachusetts, August 3-5, 2001, pp. 124-126

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N. Hoić-Božić, J. Ledić, J. Mezak, *Evaluating the Use of World Wide Web Courseware in Student Teachers' Education: a Case from Croatia,* Proceedings of Society for Information Technology and Teacher Education, SITE 2000, San Diego, Califonia, February 8-12, 2000, pp. 1894-1899

Other qualifications for course performing

Developing courseware and WWW learning materials, authoring the scientific and professional papers, attending a number of scientific conferences, participating in research projects – all in the filed of the courses performing.

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Curriculum vitae

Maja Matetić received her B.S. in mathematics and physics from the Faculty of Philosophy, University of Rijeka, Croatia, M.S. in computer and information science from the Faculty of Computer and Information Science, University of Ljubljana, Slovenia, and Ph.D. in computer science from the Faculty of Electrical Engineering and Computing, University of Zagreb, Croatia, in 1988, 1995, and 2002, respectively. Since 2004 Maja Matetić is an assistant professor at the Department of informatics at the Faculty of Philosophy, University of Rijeka, Croatia. Her current research interests include knowledge representation and discovery, qualitative representation and reasoning, machine learning, and their applications. Maja Matetić is author of 19 papers presented at international conferences or published in international journals. She worked as researcher on the projects Temporal and Fuzzy Temporal Knowledge Representation (036023), Interactive Teachware– INIS (2000-012), Man-machine communication (0009012), and at the moment on the project Speech technologies (009-0361935-0852).
Her past and present courses are Programming 1 and 2, Algorithms and Data Structures, Expert Systems, Computing practicum 1 i 2, and Informatics practicum 1 i 2.

List of course relevant publications:

Maja Matetić, Slobodan Ribarić, Ivo Ipšić: Qualitative Modelling and Analysis of Animal Behaviour, Applied Intelligence Journal 21, pp. 25-44, Kluwer Academic Publishers 2004.

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Maja Matetić, Slobodan Ribarić: "Qualitative Modelling and Reasoning About Object Beaviour in the Dynamic Vision System", Proceedings of the tenth Electrotechnical and Computer Science Conference ERK 2001, 24-26 September 2001, Portorož, Slovenia, Volume B, pp. 293-296

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Brkić, M., Matetić, M.: "Modeling Natural Language Dialogue for Croatian Weather Forecast System", *Proceedings of the 18th International Conference on Information and Intelligent Systems*, Varaždin, 2007, pp. 391-396

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Curriculum vitae	
List of relevant publications	
Kovačić, B., Z. Skočir: "Development of the Distance Learning System Based on Dialogue", *Proceedings of the IEEE Region 8 Conference EUROCON 2003 – Computer as a tool*, Volume 1, pp. 224-228, Ljubljana, Slovenia, 2003. (ISBN 0-7803-7763-x) **Kovačić, B.**: "Application of Dialogue Realized by Distance Learning System Based On Dialogue", *Proceedings of the Conference MIPRO 2003, section Computers in Education*, pp. 46 – 49, Opatija, 2003. (ISBN 953-6042-97-5) **Kovačić, B.**, Z. Skočir: "Formal Model for Distance Learning Based on Dialogue", *Proceedings of International Conference on Telecommunications IEEE ICT2001*, Vol. 1, pp. 231-236, Bucharest, Romania, 2001. (ISBN 973-99995-1-4) **Kovačić, B.**, Z. Skočir: "Application System for Learning", *Proceedings of the Sixth Electrotechnical and Computer Science Conference ERK 97*, Volume B, pp. 429-432, Portorož, Slovenija, 1997. (ISBN 961-6062-12-3) **Kovačić, B.**, ***Z. Skočir***: "Programski sustav za vrednovanje učenja", *Zbornik radova savjetovanja Računala u telekomunikacijama (CTE) MIPRO 97*, pp. 2.163-2.168., Opatija, 1997. (ISBN 953-6042-41-X)	
Other qualifications for course performing	

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Curriculum vitae

Patrizia Poščić was born in Rijeka on January 25th 1972. In 1995 she recieved her B.Sc. in Computer and Mathematical Sciences from the Faculty of Philosophy, University of Rijeka. At the same year she got a job as an assistant instructor at the Department of Informatics at the Faculty of Philosophy in Rijeka. In 2001 she received her M.Sc. from the Faculty of Organization and Informatics Varaždin, University of Zagreb. The title of her Master Theses was «Applicability analysis of methodologies for designing information systems».

Six years later, in 2007 she obtained her PhD in the field of information science at the same Faculty in Varaždin. The title of Doctoral theses was «A method for estimating the complexity of business information systems».

Since 1995. she has been working as assistant instructor at the Department of Informatics at the Faculty of Philosophy, University of Rijeka and also she participated as researcher at research projects supported by the Croatian Ministry of Science and Technology: «Methodology of Designing Information Systems» and «Methodology of Information Systems Analysis and Modeling».

She participated at numerous domestic and foreign conferences and published many scientific and professional papers in the field of Information science. Currently she is working as a senior instructor at the Department of Informatics at the University of Rijeka.

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1. Čandrlić S., Pavlić M., **Poščić P.**: **'A comparison and the desireable features of version control tools'**, 29th International Conference on Information Technology Interfaces, Cavtat, 2007.
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6. **Poščić P**., Pavlić M., Ivašić-Kos M.: **'Metoda rane i brze analize funkcijskih točaka**', CASE 17, Opatija, 2005.
7. Pavlić M., Sok A., **Poščić P.**: '**Metode pregovaranja u prodaji usluga i razvoja softvera**', CASE 17, Opatija, 2005.
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10. Poščić P., Pavlić M., Ivašić-Kos M.: **' Usporedba objektnih modela u metodikama IDEA i IDEF 4'**, CASE 14, Opatija, 2002
11. Poščić P., Pavlić M., Ivašić-Kos M.: **' Object Models in IDEA and IDEF 4 Methodologies'**, 12 th International Conference on Information and Intelligent Systems IIS 2001, Varaždin, 2001.

12. Poščić P., Pavlić M., Ivašić-Kos M.: **' IDEF 4 – metoda objektno orijentiranog dizajna**', CASE 13, Opatija, 2001.
13. Ivašić-Kos M., Pavlić M., Poščić P.: **' Dijagrami UML-a '**, CASE 13, Opatija, 2001.
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20. Ivašić-Kos M., Pavlić M., Poščić P.: **' Objektni jezik za modeliranje - OML '**, CASE 12, Opatija, 2000.
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22. Pavlić M., Poščić P., Ivašić M.: **'Objektno orijentirana analiza u metodici IDEA'**, CASE 10, Opatija, 1998.
23. Pavlić M., Poščić P.: **'Kvalitetno obrazovanje projektanata informacijskih sustava'**, Međunarodni znanstveni kolokvij: Kvaliteta u odgoju i obrazovanju, Zbornik radova, Rijeka, 1998.

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Curriculum Vitae

Sanda Martinčić Ipšić was born in 1970 in Rijeka, Croatia. She received B.Sc. degree in Computer science from the Faculty of Computer Science and Informatics, University of Ljubljana in 1994. She received M. Sc. degree in Informatics from the Faculty of Economy, University of Ljubljana in 1999. In 2007 she received the PhD degree from the Faculty of Electrical Engineering and Computing, University of Zagreb.

Since 2002 she has been working at the Department of Informatics, University of Rijeka as an assistant. Her current research interests are in the field of speech recognition, speech synthesis, speech corpora development and spoken dialog systems.

Sanda Martinčić Ipšić is author of more than 20 papers presented at international conferences or published in international journals.

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Martinčić-Ipšić, Sanda, Žibert, Janez, Ipšić, Ivo, Mihelič, France. A Bilingual Spoken Dialog System for Slovenian and Croatian Weather Forecasts. Zajc, Baldomir, (ed.), Tkalčič, Marko, (ed.). EUROCON 2003 Conference: Computer as a tool, Ljubljana, Slovenia, September 22-24, 2003: proceedings, IEEE Region 8, Slovenian section IEEE, proceedings. Vol. B, p. 140-143.

Martinčić-Ipšić, Sanda, Žibert, Janez, Ipšić, Ivo, Mihelič, France, Nikola, Pavešić. Bilingual Speech Recognition for Weather Information Retrieval Dialog System. Matoušek, Vaclav, (ed.), Mautner, Pavel, (ed.). 6th International Conference on Text, Speech and Dialogue, TSD 2003, Česke Budejovice, Czech Republic, September 8-12, 2003: proceedings, Lecture notes in computer science, Lecture notes in artificial intelligence, vol. 2807. Berlin [etc.]: Springer, cop. 2003, p. 380-387.

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Martinčić-Ipšić, Sanda, Ipšić, Ivo. VEPRAD: A Croatian Speech Database of Weather Forecasts. Budin, Leo (ed.), Lužar-Stiffler, Vesna., (ed.), Bekić, Zoran, (ed.). Hljuz-Dobrić, Vesna., (ed.). 25th International Conference on Information Technology Interfaces, June 16-19, 2003, Cavtat, Croatia. ITI 2003. proceedings. SRCE University Computing Centre, University of Zagreb, vol. 1, p. 321-326.

Martinčić – Ipšić, Sanda, Žibert, Janez, Ipšić, Ivo, Mihelič, France. Speech Recognition of Slovenian and Croatian Weather Forecasts, Gros, Jerneja, (ed.), Erjavec, Tomaž, (ed.). 5th International Conference on Information Society IS´2002: Language Technologies, October 14-15. 2002, Ljubljana. Slovenija, proceedings. Vol. B. p. 106-110.

Other qualifications for course performing

She worked as the collaborator for the Business Cybernetics and Management Information Systems at the Faculty of Economics in the year 2000./2001.

In years 2003/2004 i 2004/2005 she has been teaching The basic informatics for linguists at the Department for Croatian Language at the Faculty of Philosophy in Rijeka.

She conducted the exercise classes for the Basic Digital Technique, Computer Architecture and Organization and Digital Signal Processing.

Currently she is teaching for Formal languages and Compilers I and II at the Department for Informatics, University of Rijeka.

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Curriculum vitae

Borne on 22nd January 1973 in Rijeka, where nowadays lives. After mathematical gymnasium, in 1997 has graduated at the Faculty of Philosophy in Rijeka, earning the degree of professor of mathematics and computer science. Four years later, in 2001 received master degree in information science at the Faculty of Philosophy in Zagreb, Department of Information Science. At 2002 she has been enrolled in scientific study of the Computer science at the Faculty of Electrical Engineering and Computing in Zagreb studding for PhD degree.

Since 1998 she is working at the Faculty of Philosophy in Rijeka, at the Department of informatics, as teaching assistant for several programming or mathematical courses like OO modeling, OO programming (C++, Java), then Operational research, Expert systems, Intelligent systems and so.

She is participating at scientific research projects supported by Ministry of science and technology: Methodology of information system development (leading researcher prof. assistant. PhD Mile Pavlić) and Communication man and machine (leading researcher prof. PhD Ivo Ipšić).

From 1997 to1999, before she has been employed at the Faculty for the full time, she worked in "RIS" company as programmer and software designer, programming and developing applications for big (bank, insurance) systems, and working in all IS life cycle phases, from analyses and design to software production and introduction.

During last ten years she participates in computer skills and software reviews on town and county's level, as mentor or as member of organization committee.

From 2001 till 2005 she was president of supervise committee of civil organization «Centar tehničke kulture» Rijeka, and from 2005 she is a member of conduct committee for the same organization.

List of relevant publications

1. Ivašić-Kos M., Pavlić M., Poščić P.: 'Implementation of UML diagrams in IS design', 15th International Conference on Information and Intelligent Systems IIS, Varaždin, 2004.
2. Poščić P., Pavlić M., Ivašić-Kos M.: Object Models in IDEA and IDEF 4 Methodologies, 12th International Conference on Information and Intelligent Systems IIS, Varaždin, 2001.
3. Ivašić-Kos M., Pavlić M., Poščić P.: Whole-part relationship in UML and OML, 11th DAAAM INTERNATIONAL SYMPOSIUM, "Intelligent Manufacturing & Automation: Man-Machine-Nature", Opatija 2000, pp.199-200.
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5. Ivašić-Kos M., Pavlić M., Poščić P.: Whole-part relationship, 9th Electrotechnical and Computer Science Conference - ERK'2000, IEEE Slovenian Section, Portorož 2000, Slovenija, Volume B, pp. 27-30.
6. Ivašić-Kos M., Pavlić M., Poščić P.: Relationships in OO languages: UML and OML, 11th International Conference on Information and Intelligent Systems IIS, Varaždin 2000, pp. 65
7. Poščić P., Pavlić M., Ivašić-Kos M.: Method of Comparing Methodologies', 11th International Conference on Information and Intelligent Systems IIS, Varaždin 2000, pp.15.
8. Ivašić M.: Object oriented principals applied to an agent, "Zbornik MIPRO 2000- CIS/CTS", MIPRO Rijeka, IEEE Croatia Section, Opatija 2000, pp. 21-24.
9. Ivašić M., Pavlić M.: Approaches for building interface agents, 8th Electrotechnical and Computer Science Conference - ERK'99, IEEE Slovenian Section, Portorož 1999, Slovenija, Volume B, pp.

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Curriculum vitae

Ana Meštrović was born on July 25th 1978 in Rijeka, Croatia.. She studied at the Faculty of Education, University of Rijeka and she received the B.Sc. degree in Mathematics and Information Science in 2001.She is currently enrolled in a postgraduate PhD. study at the Faculty of Organization and Informatics in Varaždin . She is involved in the research project "Speech Technologies" (009-0361935-0852).

List of relevant publications:

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Curriculum vitae

She began her education in the primary school *Juraj Klović* in Tribalj in the Vinodolska county, and then finished the *Prva riječka hrvatska gimnazija* high school in Rijeka, Croatia. In 2001. she received her B.A. in Computer and Mathematical Sciences from the Faculty of Arts and Sciences in Rijeka, and four years later her M.A. from the Faculty of Arts and Sciences in Zagreb.
She is teaching several courses at the Department of Computer Sciences at the Faculty of Arts and Sciences in Rijeka. From the year 2001 to 2006 she was working as a junior researcher on the project called *A methodology for Information System development*, and shortly after on a project called *A methodology for Information System analysis and design*.

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Curriculum vitae:

Igor Jugo graduated in 2003. at the Faculty of Philosophy, University of Rijeka gaining the title of teacher of pedagogy and informatics. From 2004. works as an assistant at the Department of Informatics, Faculty of Philosophy, working on courses: "Computer Networks", "Web application development" and "Communication systems and society". In 2004. he started his doctoral study at the Faculty of Organization and Informatics in Varaždin. During his study as well as after graduation he worked as a lecturer in various computer centers (teaching Microsoft and Macromedia software) and as a web developer. He also has experience with computer networks. He worked as a developer on several ASP, ASP.NET and MSSQL Server based applications. He is the owner of the professional certificate: Macromedia Certified professional.

List of relevant publications:

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Curriculum vitae

Marija Brkić graduated from the University of Rijeka, Faculty of Philosophy with a B.A. in Computer Science and English Language and Literature in 2006. She started her PhD studies at the Department of Information Sciences, Faculty of Philosophy in Zagreb in 2008. She has been working at the Computer Science Department in Rijeka since February 2007 as a teaching assistant in Programming I, Programming II, Operating Systems I, Operating Systems II, and System Theory. She also works on the project "Speech Technologies" (009-0361935-0852).

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Curriculum vitae

Martina Holenko was born in 1982 in Rijeka. She lives in Delnice where she finished elementary and secondary school. She graduated in July 2006 on Faculty of Arts and Sciences in Rijeka with diploma thesis "Moderated Online Course *The Geometer's Sketchpad*" and gained a title of Professor of mathematics and informatics.

She worked for one year in secondary school teaching mathematics and informatics, and in elementary school teaching informatics.

Currently she works as an assistant at Department of informatics at University of Rijeka, in modules "Methods of teaching information science", "Multimedia systems", "Implementation of hypermedia in education", and "Operational researches".

She is enrolled in postgraduate studies at Faculty of Electrical Engineering and Computing in Zagreb. Her main interests are e-learning technologies and development of program support for that kind of learning, especially adaptive hypermedia applications.

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Curriculum vitae

I was born on April 24th 1983 in Rijeka, Croatia. After finishing high school in Rijeka I continued my education at Faculty of Engineering in Rijeka. I graduated in 2007 in the field of Electrical engineering - Automation. I am currently enrolled in a postgraduate PhD. study at the Faculty of Electrical Engineering and Computing in Zagreb, in the Computing study programme. Since September 2008 I am working as a teaching assistant at the University of Rijeka, Department of Informatics. I am involved in research on the project "Govorne tehnologije" ("Speech Technologies") (009-0361935-0852)

List of relevant publications:

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Curriculum vitae

Vedran Strčić was born on May 19th, 1980. in Rijeka, where he graduated high school in October 1998. He received his university diploma, after completing the study of Pedagogy and Informatics in Rijeka in September 2004. becoming a professor of Pedagogy and Informatics.

After getting his university diploma he enrolled "Scientific postgraduate study of Informatics Science" in Varaždin. From January 2005. till July 2005. he worked as lecturer at Carnets Edupoint educational center, and from September 2005. as assistant at Department of Informatics in Rijeka.

From September 2007. he also works as lecturer at a center for adult education "Ekspert", where he holds courses in various area of Informatics. He is currently employed at University of Rijeka, Department of Informatics where he works as assistant, currently enlisted on subjects "Basics of Informatics 1", "Object oriented programming" and "Object programming languages".

List of relevant publications