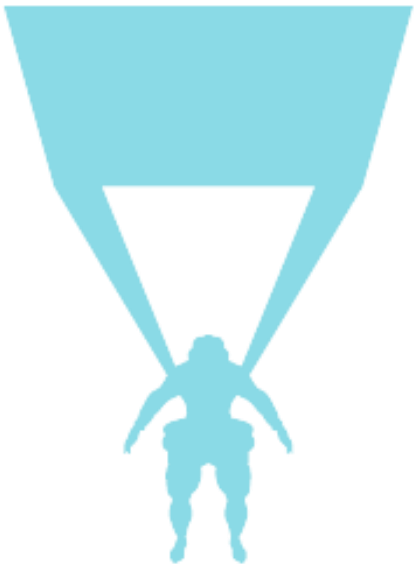
ŠIBENIK UNIVERSITY OF APPLIED SCIENCES
DEPARTMENT OF BUSINESS INFORMATICS
PROFESSIONAL UNDERGRADUATE STUDY OF BUSINESS INFORMATICS

Trg Andrije Hebranga 11
22000 Sibenik



Šibenik, July 2026.

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CURRICULUM

Academic year 2026/2027

Dean	PhD. Ljubo Runjić, college prof.
Head of department	PhD. Ivan Livaja, college prof.

Šibenik, July 2026.

1. REQUIREMENTS AND RESULTS OF THE STUDY PROGRAM

Professional undergraduate study of Business Informatics program is intended for the education of students for professional work in management in middle and higher management positions in IT business systems. The study consists of six semesters through which students are offered a high degree of mobility through the choice of program content of studies according to student affinities while maintaining the range of professional knowledge provided by the program core of the study.

Upon completion of the study program the holder of this qualification is entitled to use the legally protected professional title "Professional Bachelor (baccalaureus) of Business Informatics" (bacc. inf.) and perform professional tasks within their professions.

The general competences that the student acquires by completing the studies is the ability to solve problems, analyze, synthesize and evaluate, develop self-learning and literature research, teamwork, planning and organizing, improve numeracy and digital skills, oral and written business communication, the ability to negotiate in the mother tongue and at least two foreign languages, the ability of creative and critical thinking, generating new ideas, the ability to manage time and fulfill tasks and plans within the deadline.

During the studies, students acquire specific knowledge, skills and competences related to management of departments, processes and jobs at the lower and middle level of management in the company and related to activities like management of IT projects, implementation of business information systems, database design, documenting and application integration, modeling, transformation and improvement of business processes, adaptation and implementation of information system, development of computer programs, cooperation and communication using information technology, IT services management, project development management and application of application solutions, while taking into account the human and financial resources of enterprises, the economic, legal and technological environment.

2. EXPECTED LEARNING OUTCOMES

1. To analyze the situation, identify opportunities and anticipate problems faced by organizations and individuals in the application of information technologies
2. Define and evaluate the processes of thinking, planning, decision-making and management in terms of electronically supported business and production
3. Evaluate database design according to business requirements
4. Evaluate different digital channels in marketing campaigns and create and implement a digital marketing plan
5. Interpret mechanisms of data flow control, error control and fragmentation, ways of multiplexing data transmission using routing methods in computer networks
6. Correctly write and interpret basic concepts in the field of economics and economics of enterprises, entrepreneurs and entrepreneurship and correctly interpret their interdependencies
7. Select and apply mathematical methods, models and techniques appropriate for solving problems in the field of Business Information Systems
8. Select and apply basic principles of planning and career development in the profession and their own entrepreneurial ventures
9. Select appropriate professional literature in Croatian and foreign language, prepare and independently present presentations in Croatian and foreign language to expert and general audiences, and critically evaluate the presented professional topics
10. To support and apply ethical and environmental principles as well as legislation and standards that are applicable in information technologies
11. To relate the activities of building and maintaining the information system with the needs of the client and the user
12. Apply key aspects of information technology (programming, algorithms, data structures, databases and project management in the field of IT)
13. Rank security threats and select appropriate countermeasures to protect the information system
14. Communicate successfully with clients, users and colleagues in a verbal and written manner using appropriate terminology including the ability to communicate about the profession in a foreign language
15. Compare and select appropriate development tools at expert level
16. Valorize the important factors that affect the business of the organization and individuals, and apply the basic methods and concepts of planning, management and accounting of business
17. Conclude what are the basic principles and methods of quality project management and work successfully in a team

3. PROGRESSION THROUGH THE STUDY PROGRAM

Before the beginning of academic year, the student is required to enroll according to enrollment deadlines. A person who does not enter the academic year loses status and rights of a student. The deadlines are published on Polytechnic web sites and newsletters and, if necessary, in Polytechnic publications (brochures, promotional materials, etc.).

When enrolling in the study year for the first time, the student enrolls compulsory and elective cources in value of minimum 27 to a maximum of 35 ECTS per semester, i.e. a minimum of 60 ECTS per year, in accordance with the Study Regulations.
When enrolling students according to their academic achievments do satisfy conditions for enrollment in higher study year or a repetition of study year.

I. Students are allowed to enroll in a higher study year if they have obtained at least 50 ECTS by passing courses from the currently enrolled study year and (if applicable) have passed all courses from peceeding study year, in which case they are enrolling to following courses: all currently enrolled non-passed courses and courses from enrolling study year in the value of maximum 60 ECTS.

II. Students who didn't satisfy condition for enrollment in higher study year have the right to enroll in a repetition of the study year with or without partial enrollment of subjects from higher year of study according to following rules:

- Students enrolling in the repetition of the study year must enroll in all not passed courses from currently enrolled year and
- are eligible for partial entry of courses from the second (2.) study year if they have passed courses from the first (1.) study year in value at least 30 ECTS or are eligible for partial entry of courses from the third (3.) year of study if they have at least 30 ECTS in the second (2.) study year
- If a student has completed courses from currently enrolled study year valued in sum of 29 or fewer ECTS credits, he or she does not qualify for partial enrollment of courses

III. Students are not allowed to repeat study year more then once or to enrolle in any course more then twice

Lecturing at undergraduate professional study of Business Informatics consists of lectures, seminars, exercises, laboratory exercises, field work, practical training, projects, consultations, mentoring, colloquia, examinations and other forms of assessment and professional practice.

Prerequisites for enrollment in a higher study year are attended courses from the lower academic year (confirmed by the signature of the course lecturer). The student is obliged to attend all forms of teaching in the scope determined by the performance plan of the teaching of a particular subject.

Figure 1. Number of enrolled students in the academic year 2021./2022.

Year of study	**Full-time student**		**Part-time students**	
	First entry	Repeat	First entry	Repeat
1.	13	3	7	1
2.	15	2	6	2
3.	15	0	2	2

For economics and rationality, classes for full-time and part-time students are carried out jointly whenever possible given spatial and other conditions.

Students are obliged to complete all the commitments undertaken in the course (seminar papers, exercise protocols, project work, case studies) **which the lecturer certifies by signing the index** at the end of the semester (usually the last teaching week of the semester). **The lecturer has the right to refuse signing the index to a full-time student who is absent from more than 30% of contact hours.**

Part-time student's obligations are created according to the possibilities of their attendance in courses, which must be in accordance with the approved performance plan of the lecturing of a particular subject.

Required workload of the full-time students can be 48 hours a week at most, and not less than 40 hours, of which contact hours should not exceed 24 hours a week. Exceptionally, students' workload/contact hours may be greater in the case of intensive professional praxis or project/laboratory work, but not more than two weeks in a row during the semester.

Professional Undergraduate Study of Business Informatics is evaluated with 180 ECTS credits, which are realized through passing of enrolled of the courses, performing professionall praxis and writing bachelor thesis.
Before completing the bachelor thesis, the student **must pass all enrolled courses**. The total number of credits placed including courses, professional praxis and the bachelor thesis should be **at least 180 ECTS points.**

4. LIST OF FACULTY MEMBERS WHO LECTURE ON PROFFESIONAL UNDERGRADUATE STUDY OF BUSINESS INFORMATICS

NAME AND SURNAME OF THE LECTURER	COURSE	CONTACT E-MAIL	CONSULTATION
Ivana BELJO, Master in eng.mat. ing., s. lec.	Financial Mathematics Mathematics	ibeljo@vus.hr	Room 24/II
Goran CRNICA, prof., lec.	English for Information Technology I English for Information Technology II	gcrnica@vus.hr	Room 22/II
Divna GOLEŠ, Master in econ., s.lec.	Principles of microeconomics Quality management	divna@vus.hr	Room 4
Anita GRUBIŠIĆ, Master in econ., s.lec.	Principles of accounting	anita@vus.hr	Room 8
Milan HRGA, Master in eng., lec.	Introduction to Computer Science Programming Fundamentals Introduction to Web Technologies Introduction to Computer Science	mhrga@vus.hr	Room 12
Zvonimir KLARIN, asistent.	Introduction to Databases Introduction to Computer Networks Databases Information Systems Analysis and Design Protection and Security of Information Systems Computer Networks Professional Praxis	zklarin@vus.hr	Room 12
PhD Ivan LIVAJA, college prof.	Introduction to Databases Databases Management of Information Services Protection and Security of Information Systems Professional Praxis	ilivaja@vus.hr	Room 18/II
PhD Dijana MEČEV, college prof.	Principles of Economics	dijana@vus.hr	Room 3
PhD.Ana PERIŠIĆ, Master in eng., s.lec.	Mathematics Business Statistics	sisak@vus.hr	Room 24/II
MSc Tanja RADIĆ LAKOŠ, s.lec.	Information Technologies and Environmental Protection	tanja@vus.hr	Room 11
Jasmina SLADOLJEV, Master in econ., s.lec.	Management	jasmina@vus.hr	Room 5
PhD. Ana VUKIČEVIĆ, college prof.	Entrepreneurship	ana_u@vus.hr	Room 15
PhD Frane UREM, college prof.	Business Information Systems Information Systems Analysis and Design Development of Mobile Applications	frane.urem@vus.hr	Room 6
Jelena ŽAJA, Master in econ., lec.	Financial Management	jzaja@vus.hr	Room 3
PhD Dragan Zlatović, college prof.	Commercial and Copyright Law	zlatovic@vus.hr	Room 20

NAME AND SURNAME OF THE LECTURER	COURSE	CONTACT E-MAIL	CONSULTATION
MSc Danijel Mileta, s. lec.	E-business	danijel.mileta@gmail.com	Room 1
Msc. Darko JUREKOVIĆ, v.pred.	Project Management Cloud Computing	darko.jurekovic@hotmail.com	Room 1
Luca OLIVARI mag.math., asistent	Financial Mathematics Business Statistics	lolivaril@vus.hr	Room 1
PhD. Ivica POLJIČAK, college prof.	Business Communication	poljicak@vus.hr	Room 20

5. PLACE OF TEACHING OF THE UNDERGRADUATE PROFESSIONAL STUDY OF BUSINESS INFORMATICS

Conducting classes at the undergraduate professional study of Business Informatics is performed in the Polytechnic of Šibenik main building, at the address: Šibenik, Trg Andrije Hebranga 11. In the mentioned location, apart from the service offices, there are 16 lecture halls with a total area of 757 m^2.

The premises in which the teaching process takes place provide optimal conditions with regard to the number of enrolled students. The aforementioned space contains spatial capacities that, in keeping with the standards of higher education, enable students to have good quality monitoring and participation in educational activities.

Classes at the Polytechnic take place from Monday to Friday (in exceptional cases on Saturdays in the morning) according to the fix schedule of the lessons published on the notice boards and on the official website of the Polytechnic. In accordance with the requirements of the *Regulation on the content of license and conditions for issuing license to perform activities of higher education, carrying out study programs and re-accreditation of higher education institutions* (Official Gazette No. 24/10) Article 5 (2), the Polytechnic has a ratio of students and the space available for the teaching (1.25 m^2 / student.

6. LIST OF COURSES, LECTURER AND ASSOCIATES, TIMETABLE OF THE SUBJECT, STUDENT WORKLOAD OF THE PROFFESIONAL UNDERGRADUATE STUDY OF BUSINESS INFORMATICS

M / E	SUBJECT HOLDER	COURSE	LECTURER - LECTURES	LECTURER - EXERCISES / SEMINARS	Lectures hours/week	Seminars hours/week	Exercises hours/week	ECTS
		III. SEMESTER						
M	Grubišić A.	Principles of Accounting	Grubišić A.	Grubišić A	2		2	**5**
M	Udovičić A.	Management with entrepreneurship	Udovičić A.	Udovičić A.	2	1		**4**
M	Pavelic M.	Object Oriented Programming	Pavelic M.	Pavelic M.	2		2	**6**
M	Klarin Z.	Introduction to Operating systems	Klarin Z.	Klarin Z.	2		2	**4**
M	Livaja, I.	Introduction to Databases	Livaja, I.	Livaja, I.	2		2	**4**
M	Zlatović, D.	Commercial and Copyright Law	Zlatović, D.	Zlatović, D.	2	1		**3**
M	Šišara J.	Principles of Marketing	Šišara J.	Šišara J.	2	1		**3**

M / E	SUBJECT HOLDER	COURSE	LECTURER - LECTURES	LECTURER - EXERCISES / SEMINARS	Lectures hours/week	Seminars hours/week	Exercises hours/week	ECTS
		IV. SEMESTER						
M	Perišić, A.	Business Statistics	Perišić, A	Perišić, A.,	2		2	**6**
M	Klarin Z.	Introduction to Computer Networks	Klarin Z.	Klarin Z.	2		2	**4**
M	Urem, F.	Business Information Systems	Urem, F.	Urem, F.	2		2	**4**
M	Klarin Z./Markić I.	Operating Systems	Markić I.	Markić I.	2		2	**6**
M	Pavelic M.	Object Oriented Programming	Pavelic M.	Pavelic M.	2		2	**6**
M	Livaja, I.	Databases	Livaja, I.	Livaja, I.	2		3	**6**
M	Pavelic M.	Development of web applications	Pavelic M.	Pavelic M.	2		2	**4**

***M - mandatory course**
E - elective course

M / N	SUBJECT HOLDER	COURSE	LECTURER - LECTURES	LECTURER - EXERCISES / SEMINARS	Lectures hours/week	Seminars hours/week	Exercises hours/week	ECTS
		V. SEMESTER						
M	Urem, F.	Information systems analysis and design	Urem, F.	Urem, F.	2		4	**6**
M	Livaja, I.	Management of information services	Livaja, I.	Livaja, I.	2		2	**4**
M	Klarin Z.	Protection and security of information Systems	Klarin Z.	Klarin Z.	2		2	**4**
M	Klarin Z.	Computer networks	Klarin Z.	Klarin Z.	2		2	**4**
E	Pavelic M.	Development of mobile applications	Pavelic M.	Pavelic M.	2		2	**4**
E	Šišara J.	Digital marketing and marketing analytics	Šišara J.	Šišara J.	2	1		**4**
E	Beljo I.	Operation research	Beljo I.	Beljo I.	2		2	**4**
E	Goleš D.	Quality management	Goleš D.	Goleš D.	2	1		**4**
E	Livaja, I.	Internet of Things	Livaja, I.	Livaja, I.	2	1		**4**

M / N	SUBJECT HOLDER	COURSE	LECTURER - LECTURES	LECTURER - EXERCISES / SEMINARS	Lectures hours/week	Seminars hours/week	Exercises hours/week	ECTS
		VI. SEMESTAR						
O	Livaja I./Jureković D.	Project management	Livaja I./Jureković D.	Livaja I./Jureković D.	2		2	**4**
I	Urem, F./Jureković D.	Cloud computing	Urem, F./Jureković D.	Urem, F./Jureković D.	2		2	**4**
O	Klarin Z.	Professional praxis	Livaja, I.	Klarin Z./ Hrga M.				**12**
		Bachelor thesis						**10**

***M - mandatory course**
E - elective course

7. CALENDAR FOR THE ACADEMIC YEAR 2026/2027.

The academic calendar for the academic year 2026/27 is available on the web

8. CALENDAR OF FINAL EXAMINATIONS FOR ACADEMIC YEAR 2026./2027.

The regular winter exam period lasts from January 26, 2026 to February 20, 2026.
The regular summer exam period lasts from June 8, 2026 to July 3, 2026.
The regular autumn exam period lasts from August 24, 2026 to September 18, 2026.

9. SYLLABUSES OF ALL COURSES INCLUDED IN STUDY PROGRAM

1. GENERAL INFORMATION ABOUT THE SUBJECT			
1.1. Title	**Information Systems Analysis and Design**	1.8. ISVU course code	146379
1.2. Lecturer	Frane Urem PhD prof	1.9. MOZVAG course code	
1.3. Assistants and/or associates		1.10. Forms of teaching (number of hours Lecturing +Practical exercises + Seminars + e learning)	(30+30+0+0)
1.4. Study programme (specialist, undergraduate, graduate)	undergraduate	1.11. Level of e- learning application (1st, 2nd, 3rd level), percentage of on line course performance (max. 20%)	3rd – materials available On-line, 0%
1.5. Course status (mandatory, elective)	mandatory	1.12. Number of course revisions	1.
1.6. Study year	3rd	1.13. Modernization	■ yes ☐ no
1.7. Credit score (ECTS)	6	1.14. Percentage estimate of course changes and/or supplements	Less than 20% ■ More than 20 % ☐
2. COURSE DESCRIPTION			
2.1. Course objectives	Acquiring knowledge in logical design and analysis of information systems (IS). To equip students for independent and team work in the application, methodology, methods and techniques of designing information systems for business organizational systems. By acquiring and using course knowledge, students will understand that there is no realization of a real and complex information system without a detailed analysis and preparation of a documented project of the information system on the basis of which the development (physical realization) of the IS is carried out.		

2.2. Terms of course entry and required competences	Four-year high school education completed; having a qualification at level 4.2	
2.3. Learning outcomes on the study programme level	IU9 Select appropriate professional literature in Croatian and foreign languages, prepare and independently deliver presentations in Croatian and foreign languages to expert and general audiences, and critically evaluate the presented professional topics	
	IU12. Apply key aspects of information technology (programming, algorithms, data structures, databases and project management in the field of information technology)	
	IU15. Compare and select appropriate development tools at expert level	
	IU17. Conclude what are the basic principles and methods of quality project management and work successfully in a team	
2.4. Expected learning outcomes on the course level	**Learning outcomes** towards Bloom's taxonomy: (up to two verbs per LO)	**LO Level:** *37. Recapture,* *38. Understanding,* *39. Application,* *40. Analysis,* *41. Evaluation,* *42. Synthesis*
	1. Conduct business analysis in a real system in order to obtain the necessary information about the current state of IS	3, 4, 5, 6
	2. Break down business functions into elemental processes - perform functional decomposition of a real system	2, 3, 4, 6
	3. Demonstrate business processes	2, 3, 4, 6
	4. Describe data flows and data repositories	2, 3, 4, 6
	5. Create a conceptual data model	2, 3, 4, 6
	6. Translate the conceptual data model into a relational data model.	2, 3, 4, 6
	7. Develop algorithms for obtaining the most important information from the set relational data model	2, 3, 4, 6
	8. Select IT technology resources according to the IS project created	2, 3, 4, 6
	9. Estimate the cost of a new (engineered) IS	2, 3, 4, 6

2.5. Course content according to detailed curriculum schedule

Constructive alignment

No:	Thematic ensemble / Lecture Topic	Course LO	Content / Teaching Method	Evaluation	Time needed
1.	Introduction to the course and detailed curriculum.	-			2 hours
	Basic terms	1,2,3	Listening to lectures, working on a computer, reading literature.	Basic terms	8 hours
2.	Information system	1,2,3	Listening to lectures, working on a computer, reading literature.	Describe key stakeholders in building and using an information system Analyze business needs in building and using an information system Identify the impact of technological development on the construction and use of information systems	10 hours

	3.	Information system	1,2,3	Listening to lectures, working on a computer, reading literature.	Interpret a simplified description of information system development Expose different views of stakeholders on parts of the information system	10 hours
	4.	Basics of information systems development methodologies	1,2,3,4	Listening to lectures, working on a computer, reading literature.	Explain Capability Maturity Model for evaluating development quality Identify basic principles in the development of information systems Interpret more important methodologies for developing information systems	10 hours
	5.	Basics of information systems development methodologies	1,2,3,4	Listening to lectures, working on a computer, reading literature.	Explain the methodology of waterfall development Explain the methodology of rapid application development Explain the methodology of information engineering Explain the methodology of the unified development process Expose the most famous agile methodologies and explain their features	10 hours
	6.	Project management	1,2,3,4,5,9	Listening to lectures, working on a computer, reading literature.	Analyze project success Identify competencies of project managers	10 hours
	7.	Project management	1,2,3,4,5,9	Listening to lectures, working on a computer, reading literature.	Identify core project management functions Apply project management methods	10 hours
	8.	System Analysis	1,2,3,4,5,6,9	Listening to lectures, working on a computer, reading literature.	Collect information from stakeholders of the information system and identify project requirements Apply requirements determination processes to the system and fact-finding techniques Review existing documentation, forms and database Perform a work environment observation Design questionnaires Interviewing Analyze and model data Identify entities, attributes, keys, connections, foreign keys Apply ERD tagging Use logical matrices in modeling the connections between entities	15 hours
	9.	System Analysis	1,2,3,4,5,6,9	Listening to lectures, working on a computer, reading literature.	Identify special forms of connections: non-specific links, redundant links, recursive links Perform data normalization Use CASE tools in data modeling Model processes Perform system decomposition Develop a data flow model	15 hours

	10.	System Analysis	1,2,3,4,5,6,9	Listening to lectures, working on a computer, reading literature.	Interpret the basic settings of object-oriented analysis Design classes and objects Design methods and messages between objects Apply encapsulation and hide information Analyze inheritance Apply polymorphism Develop class and object diagrams Develop component and layout diagrams Make use cases Develop activity diagrams Develop interaction diagrams Develop state diagrams Analyze the feasibility and cost-benefits of system enhancements (operational feasibility, technical and technological feasibility, time feasibility, economic feasibility)	15 hours
	11.	System Design	5,6,7,8,9	Listening to lectures, working on a computer, reading literature.	Develop your own simple information system solution Analyze procurement of ready-made solutions Identify business management systems To substantiate the decision to procure the finished solution Select the appropriate system architecture	15 hours
	12.	System Design	5,6,7,8,9,10	Listening to lectures, working on a computer, reading literature.	Describe distributed systems Explain architectures with clients and servers Explain network architectures Explain web architecture	15 hours
	13.	System Design	5,6,7,8,9,10	Listening to lectures, working on a computer, reading literature.	Explain service oriented architectures Design information system security architecture Design a database Design a user interface	15 hours
	14.	System design, implementation and maintenance	5,6,7,8,9,10	Listening to lectures, working on a computer, reading literature.	Apply standards and recommendations in programming Generate part of the code according to the default specification	15 hours
	15.	System design, implementation and maintenance	5,6,7,8,9,10	Listening to lectures, working on a computer, reading literature.	Check the correctness of the created program code Provide user documentation and documentation for system maintenance	15 hours

3. EVALUATION OF STUDENT WORK	
3.1. Students` obligations	In accordance with the Book of Rules and the Rulebook on Student Assessment and Evaluation: for all regular students attend at least 70% attendance. Part-time students have the obligation to attend at least 50% of lectures. All students must create, present and positively colloquy seminar paper. Students who have during the course achieved: • From 0 – 24,9% ECTS credits- is rated F (unsuccessful) and cannot get ECTS credits and must re-enrol the subject in the next academic year; • From 25 – 49,9% ECTS credits - is rated FX (inadequate) and has to come out and pass the test (exam). A written exam can be held in a regular or extraordinary exam period;

	• More than 50% ECTS credits - students have the right to access the final exam of the subject. Students can take the final exam in the course in two ways: a) during the course of teaching through continuous monitoring of students (active participation in classes and exercises and two exams); b) during class (active participation in classes and exercises) and passing exams (written and oral examinations).

3.2. Monitoring student work (enter the share of ECTS credits for each activity so that the total number of ECTS points corresponds to the credit score of the course)

Attendance	2	Written exam	2 (by submitting both colloquiums the student is relieved of an written examination)	Project	
Experimental work		Research		Practical work	1
Essay		Report		Continuous examination	
Colloquium	3 (by submitting both colloquiums the student is relieved of a written and oral examination)	Seminar paper		Other (inscribe)	
Class activities		Oral exam	1 (by submitting both colloquiums the student is relieved of an oral examination)	Other (inscribe)	

3.3. Student workload

The student's workload on all bases amounts to 1 ECTS point for 30 hours of work per semester and is estimated as:

Commitment	***Hours (estimate)***
24. Attending classes	60
25. Practical work	30
26. Preparation for the Colloquium / exam through self-study	90

4. GRADING

4.1. Seminar paper grading

Valuation Element	**Poor**	**Satisfying**	**Above average**

4.2. Colloquium / exam grading

Poor	**Satisfying**	**Above average**
Give answer by memory, no deeper understanding. Does not know and does not apply the basic terms	Reproduces basic terms, without difficulty transfers new knowledge, understands subject matter, explains	Knowledge is at the level of analysis, synthesis and evaluation. It observes legitimacy, accurately and thoroughly explains the content of the subject, and

	and concepts. Cannot apply or explain the contents of the course.	the terms and the notions that substantiate by examples.	logically links and explains the terms and concepts that it encapsulates. Find solutions that are not originally given. There is a correlation with correlative subjects.	

4.3. Creating a final grade according to evaluation elements

Active participation in the lessons	70-75% of attendance	76-86% of attendance	87-100% of attendance	Created mental map. Solved case study.
	4 points	7 points	10 points	3 points
Seminar paper	2	3	4	5
	5 points	7 points	8 points	10 points
Colloquium / written exam	2	3	4	5
	50-64,9%	65-79,9%	80-89,9%	90-100%
	25 points	30 points	35 points	40 points
Oral exam	2	3	5	5
	25 points	30 points	35 points	40 points

4.4. Creating a final grade according to absolute allocation

Percentage of adopted knowledge, skills and competences (teaching + final exam)	Numerous grade	ECTS grade
90 – 100%	5 (excellent)	A
80 – 89,9%	4 (very good)	B
65 – 79,9%	3 (good)	C
60 – 64,9%	2 (sufficient)	D
50 – 59,9%	2 (sufficient)	E

5. ADDITIONAL INFORMATION ABOUT THE COURSE

	Title	**Number of copies in the library**	**Availability via other media**
5.1. Compulsory literature (available in the library and through other media)	F. Urem, Projektiranje i analiza IS-a, Veleučilište u Šibeniku, 2016., ISBN: 978-953-7566-30-2		Available online at e-learning system
5.2. Additional literature (at the moment of changes and/or amended of study programme)	J. A. Hoffer, J. F. George, J. S. Valacich: Modern Systems Analysis and Design, 3/e, Prentice Hall College Div, 2001. Eeles, P.; O. Sims, Building Business Objects. John Wiley & Sons, 1998.	3	Available online at e-learning system

5.3. Quality assurance methods that ensure the acquisition of knowledge, skills and competences	The control of students' work quality and the acquisition of necessary knowledge and skills will be ensured through interactive work. By keeping track of attendance and student activity during classes and provided information on students` progress through short colloquiums and homework, information for further guidance to students will be provided in order to increase the efficiency of their work. Students will be informed about their rights and obligations as well as the methods of work and the required literature. Indicators of quality assurance system: Student survey, monitoring of annual data from the Croatian employment service on the annual state of student employment, surveys from employers and Alumni association.
5.4. information on the course and contact with the teacher	It is obligatory for every student to regularly inform about the course, teaching and teaching activities. All information about teaching or any delay in teaching will be published on the e-learning pages of the course and on the web pages of the Polytechnic. Students can contact the teachers during the consultation term (at least one hour per week), while brief questions and explanations can be addressed during classes. It is possible to ask questions by e-mail (from the official e-mail address from the domain @ vus.hr) that will be answered in a short time (no later than five working days from the receipt of e-mail).

· GENERAL INFORMATION			
1.1. Course lecturer	Ivan Livaja	1.8. Course code in ISVU	146372
1.2. Course title	**Management of Information Services**	1.9. Course code in MOZVAG	
1.3. Assistants and/or associates	Zvonimir Klarin	1.10. Forms of teaching (number of hours Lecturing +Practical exercises + Seminars + e learning)	(30+30+0+0)
1.4. Study programme (specialist, undergraduate, graduate)	**Undergraduate Professional Study of Business Informatics**	1.11. Level of e- learning application (1st, 2nd, 3rd level), percentage of on line course performance (max. 20%)	1st, course materials are on-line, 0%
1.5. Course status (mandatory, elective)	Mandatory	1.12. Number of course revisions	2
1.6. Year of study	3st	1.18.Modernization	Yes
1.7. Credit score (ECTS)	4	1.14. Percentage estimate of course changes and/or supplements	Less than 20% X□ More than 20 % □
2. COURSE DESCRIPTION			
2.1. Course objectives	- Getting to know the area of information services and trends - Adopting and expanding knowledge for the area through: Professional Provision of Services Development of service development strategy Forming a service Management of services Supervising delivery and quality of service - The aim of the course is to introduce students to the information services strategy in order to shape and deliver new services so they can independently participate in the development and implementation of new services.		
2.2. Terms of course entry and required competences	4 year secondary education completed; qualification level 4.2 according to the CROQF.		
2.3. Learning outcomes on the study programme level	LO1: To analyze the situation, identify opportunities and anticipate the problems encountered by organizations and individuals in the application of information technologies LO3: Evaluate database design according to business requirements LO8: Select and apply basic principles of planning and career development in the profession and their own entrepreneurial ventures LO9: Select appropriate professional literature in Croatian and foreign language, prepare and independently present presentations in Croatian and foreign language to expert and general audiences, and critically evaluate the presented professional topics		

	LO16: Valorize the important factors that affect the business of the organization and individuals, and apply the basic methods and concepts of planning, management and accounting of business LO17: Conclude what are the basic principles and methods of quality project management and work successfully in a team

2.4. Expected learning outcomes on the course level

Learning outcomes accroding to the Bloom`s taxonomy: (up to two verbs per LO)	**Level of LO:** *1- remembering, 2- understanding, 3- application, 4-analysis, 5-evaluation, 6-synthesis*
1. Apply standards / methods / recommendations for managing information services.	3, 1
2. Explain the basic concepts used in managing information services.	1
3. Describe both the state and trends of the development of modern information and communication technologies	4
4. To propose to the users the implementation of appropriate world recommendations and standards.	5
5. Present the acquired knowledge, ideas, problems and solutions independently and in a team.	6
6. Apply ethical principles, regulations and standards applicable to the profession	3

2.5. Course content according to detailed curriculum schedule

Constructive allignement

no	**Thematic unit**	**LO of the course**	**Content/teaching methods**	**Evaluation**	**Time**
1	Definition of a service; Role of services in the society	-	Listen to lectures. Work independently on computer, get to know course content and elearning documents.	-	10 h
2.	Areas of providing services and service customers	1, 2, 3	Listen to lectures and read literature. The exercises demonstrate how to solve tasks. Solve exercises.	At the midterm or the written / oral exam, they define the basic concepts of services.	6 h
3.	Market of informatics services history, trends	1, 13	Listen to lectures and read literature. The exercises demonstrate how to solve tasks. Solve exercises.	At the midterm or the written / oral exam, they define the basic concepts of service delivery	7 h
4.	Growth and globalization of services; Service strategies, price markets	1, 3, 13	Listen to lectures and read literature. The exercises demonstrate how to solve tasks. Solve exercises.	In the midterm or the written / oral exam, they define the markets for IT services	7 h
5.	Services Provided by Technology, E-Services	1, 2, 3, 13, 14	Listen to lectures and read literature. The exercises demonstrate how to solve tasks. Solve exercises.	At the colloquium or the written / oral exam they can define professional ethics and standards. Practical work created and presented (using computer programs and sources of information and communication technologies independently).	7 h
6.	Development of new service. Quality service planning	1, 2, 3, 13, 14	Write the colloquium.	-	8 h
7.	Planning and management of projects and	1, 2, 3, 13, 14	Listen to lectures and read literature. The exercises demonstrate how to solve tasks. Solve exercises.	At the colloquium or the written / oral exam they can define professional ethics and standards. Practical work created and presented (using	8 h

				computer programs and sources of information and communication technologies independently).		
8.	Professional ethics; Licensing, certifying and accrediting; Norms;	1, 2, 3, 13, 14	Listen to lectures and read literature. The exercises demonstrate how to solve tasks. Solve exercises.	At the colloquium or the written / oral exam they can define professional ethics and standards. Practical work created and presented (using computer programs and sources of information and communication technologies independently).	8 h	
9.	Investment proposal and feasibility study	1, 2, 3, 13, 14	Listen to lectures and read literature. The exercises demonstrate how to solve tasks. Solve exercises.	At the midterm or the written / oral exam, they can define the investment eleaborate and the feasibility study. Practical work created and presented (using computer programs and sources of information and communication technologies independently).	8 h	
10.	Service management; Market management supply and demand	1, 2, 3, 13, 14	Listen to lectures and read literature. The exercises demonstrate how to solve tasks. Solve exercises.	At the midterm or the written / oral exam, they can define the investment eleaborate and the feasibility study. Practical work created and presented (using computer programs and sources of information and communication technologies independently).	8 h	
11.	Service quality supervision and control; Support functions	1, 2, 3, 13, 14	Listen to lectures and read literature. The exercises demonstrate how to solve tasks. Solve exercises.	At the midterm or the written / oral exam, they can define the investment eleaborate and the feasibility study. Practical work created and presented (using computer programs and sources of information and communication technologies independently).	9 h	
12.	Offer requirement and competition documentation; Calculation and service offering; Forms of contract relationship; Service contract s and fulfilment of service obligations; Supervision, reporting and communication	1, 2, 3, 13, 14	Listen to lectures and read literature. The exercises demonstrate how to solve tasks. Solve exercises.	At the midterm or the written / oral exam, they can define the investment eleaborate and the feasibility study. Practical work created and presented (using computer programs and sources of information and communication technologies independently).	9 h	
13.	IT finance management	1, 2, 3, 13, 14	Listen to lectures and read literature. The exercises demonstrate how to solve tasks. Solve exercises.	At the midterm or the written / oral exam, they can define the investment eleaborate and the feasibility study. Practical work created and presented (using computer programs and sources of information and communication technologies independently)..	9 h	
14.	Defense and presentation of the seminar	1, 2, 3, 13, 14	Write the colloquium.	-	9 h	
15.	Defense and presentation of the seminar, recurrence of colloquia		Listen to lectures and read literature.	-	9 h	

3. EVALUATION OF STUDENTS` WORK

3.1. Students` obligations	In accordance with the Regulations on Studying and the Regulations on StudentAssessment and Evaluation: for all full-time students attendance of at least 70%. Part-time students are required to attend classes at least50%.All students are required to carry calculator and formulae list. Students who have during the course achieved: • from 0 - 24,9% ECTS credits- are rated F (unsuccessful) and cannot obtain ECTS credits, and must re-enroll in the next academic year; • from 25 - 49,9% - are assessed by FX (insufficient) and must pass the written exam (test). Written exam (test) can be held in a regular or extraordinary exam period; • more than 50% - students have the right to take the final exam. Students cantake the final exam from the course in two ways: a) during the course ofteaching through continuous monitoring of students (active participationin classes and through two colloquia); b) by passing the exam (writtenand oralpart of the exam).

3.2. Monitoring student work (enter the share of ECTS credits for each activity so that the total number of ECTS points corresponds to the credit score of the course)						
	Attendance	1,0	Written exam	1,5 (without colloquia)	Project	
	Experimental work		Research		Practical work	
	Essay		Report		Continuous examination	
	Colloquium	1,5 (without written exam)	Seminar paper	1,0	Other	
	Class activity		Oral exam	0,5	Other	

3.3. Student workload	Student workload on all bases for 1 ECTS credit is 30 hours in a semester and is estimated as: 1. Attending classes and exercises 60 hours 2. Preparing colloquia or exams through individual work 60 hours

4. GRADING SYSTEM

4.1. Grading seminar papers	

4.2. Grading colloquia/ written and oral exam

Unsatisfactory	Satisfactory	Above average
Responds by memory, without a deeper understanding. Does not know or apply basic terms and concepts. Does not know how to apply or explain the contents of the course with examples.	Reproduces the basic concepts and without difficulty imparts new knowledge, understands the material, explains the terms and concepts supported with examples.	Knowledge is at the level of analysis, synthesis and evaluation. Observes the principles, accurately and thoroughly explains the content of the material, and logically connects and explains the terms and concepts supported with examples. Finds solutions that were not originally given. Notes correlations with related material.

4.3. Final grade according to evaluation elements	Active course attendance	70-74,9% of attendance	75-79,9% of attendance	80-89,9% of attendance	90-100% of attendance
		2 points	5 points	10 points	20 points
	Colloquia/ Written exam	2	3	4	5
		50-64,9%	65-79,9%	80-89,9%	90-100%
		25 points	30 points	35 points	40 points
	Oral exam	2	3	5	5
		25 points	30 points	35 points	40 points

4.3. Final grade according to absolute division

Percentage of acquired knowledge, skills and competences (teaching + final exam)	Numerical grade	ECTS grade
90 – 100%	5 (excellent)	A
80 – 89,9%	4 (very good)	B
65 – 79,9%	3 (good)	C
60 – 64,9%	2 (satisfactory)	D
50 – 59,9%	2 (satisfactory)	E

5. ADDITIONAL COURSE INFORMATION

	Title	Number of copies in the library	Availability via other media
5.1. Compulsory literature (available in the library and via other media)	Fitzsimmons, J.A.; Fitzsimmons, M.J. Service Management: Operations, Strategy, and Information Technology. 5th Ed., Irwin/McGraw-Hill, Homewood, IL, 2006.		
5.2. Additional literature (at the moment of changes and/or amended of study programme)	Teaching material and exercises .IT Infrastructure Library, Office of Government Commerce and IT Service Management Forum http://www.itil.co.uk 2. SFIA – The Skills Framework for the Information Age, http://www.sfia.org.uk/		
5.3. Quality assurance methods that ensure the acquisition of knowledge, skills and competences	The control of students' work quality and the acquisition of necessary knowledge and skills will be ensured through interactive work. By keeping track of attendance and student activity during classes and provided information on students` progress through short colloquiums and homework, information for further guidance to students will be provided in order to increase the efficiency of their work. Students will be informed about their rights and obligations as well as the methods of work and the required literature. Indicators of quality assurance system: Student survey, monitoring of annual data from the Croatian employment service on the annual state of student employment, surveys from employers and Alumni association.		
5.4. Informing about the course and contacting the teacher	It is the responsibility of each student to be regularly informed about the course, the coursework, and the classroom activities. All notices of classes or possible adjournment will be published in a timely manner on the e-learning site of the course and on the website of the Polytechnic. Students can contact teachers during the consultation period (at least one hour per week), while for short questions and explanations they can be contacted during class. It is also possible to ask questions by e-mail (from the official e-mail address at @ vus.hr), which will be answered as soon as possible (no later than five working days after receiving the e-mail).		

1. GENERAL INFORMATION			
1.1. Course lecturer	Ivan Livaja	1.8. Course code in ISVU	187581
1.2. Course title	**Protection and Security of Information Systems**	1.9. Course code in MOZVAG	
1.3. Assistants and/or associates		1.10. Forms of teaching (number of hours Lecturing +Practical exercises + Seminars + e learning)	(30+30+0+0)
1.4. Study programme (specialist, undergraduate, graduate)	Undergraduate Professional Study Business informatics	1.11. Level of e- learning application (1st, 2nd, 3rd level), percentage of on line course performance (max. 20%)	1st, course materials are on-line, 0%
1.5. Course status (mandatory, elective)	Elective	1.12. Number of course revisions	2
1.6. Year of study	3rd	1.19.Modernization	Yes
1.7. Credit score (ECTS)	4	1.14. Percentage estimate of course changes and/or supplements	Less than 20% X□ More than 20 % □

2. COURSE DESCRIPTION		
2.1. Course objectives	To individually and responsibly search relevant literature for reaching solutions and conclusions in Croatian and foreign languages To recognize and rank security threats, as well as to select and apply appropriate countermeasures to protect the information system To interpret mechanisms for the control of: data flow, errors and fragmentation, data transfer multiplexing methods using routing methods in computer networks; as well as to configure and maintain active network devices	
2.2. Terms of course entry and required competences	4 year secondary education completed; qualification level 4.2 according to the CROQF.	
2.3. Learning outcomes on the study programme level	LO2: to define and evaluate process of thinking, planning, decision making and management in terms of electronically supported business and product	ion
	LO3: to define and evaluate process of thinking, planning, decision making and management in terms of electronically supported business and product	io
	LO16: to valorize elevant factors that affect organization`s and individual`s business and apply basic methods and concepts of planning, management	and ac
	LO17: to conclude what the basic principles and methods of good project management are and work successfully in a team	
2.4. Expected learning outcomes on the course level	**Learning outcomes** accroding to the Bloom`s taxonomy: (up to two verbs per LO)	**Level of LO:** *1- remembering,* *2- understanding,* *3- application,*

		4- analysis, 5- evaluation, 6-synthesis
	1. Assess information security risks	2, 4
	2. Apply information system security procedures	3
	3. Describe the proposed security system solution	1, 4
	4. Propose and argue proposals for the protection of the information system	5, 6
	5. Present the acquired knowledge, ideas, problems and solutions independently and in a team.	6
	6. Use materials and tools to search scientific and professional literature in native and English languages	3
	7. Identify and rank security threats and select and apply appropriate countermeasures to protect the information system	3

2.5. Course content according to detailed curriculum schedule

Constructive allignement

no	Thematic unit	LO of the course	Content/teaching methods	Evaluation	Time
1.	Defining security issues, objectives, principles and security policy	1, 2, 5	Listen to lectures. Work independently on computer, get to know course content and elearning documents.	-	18 h
2.	Defining security issues, objectives, principles and security policy	1, 2, 3, 5	Listen to lectures and read literature. The exercises demonstrate how to solve tasks. Solve exercises.	At the midterm or written / oral exam, they define the foundations of analysis and risk	10 h
3.	Access control and flow control; Mathematical models of security	2, 3	Listen to lectures and read literature. The exercises demonstrate how to solve tasks. Solve exercises.	At the midterm or the written / oral exam, they define the basic concepts of access controls and flows.	10 h
4.	Basics of cryptography; The protocols, techniques and algorithms	7	Listen to lectures and read literature. The exercises demonstrate how to solve tasks. Solve exercises.	At the midterm or the written / oral exam, they define the basic concepts of cryptography.	10 h
5.	The architecture of the security system – basic modules	3, 4, 5, 6, 7	Listen to lectures and read literature. The exercises demonstrate how to solve tasks. Solve exercises.	At the midterm or the written / oral exam, they define the basic concepts of security architectures	10 h
6.	Methods of digital identification and authentification	3, 4, 5, 6, 7	Write the colloquium.	-	10 h
7.	Security and protection of programs and operating systems	3, 4, 5, 6, 7	Listen to lectures and read literature. The exercises demonstrate how to solve tasks. Solve exercises.	At the colloquium or the written / oral exam define security and protection of programs and operating systems	10 h
8.	Standards and criteria for evaluation of security and thrustworthiness of systems	3, 4, 5, 6, 7	Listen to lectures and read literature. The exercises demonstrate how to solve tasks. Solve exercises.	At the colloquium or the written / oral exam define Standards and criteria for evaluation of security and thrustworthiness of systems	10 h
9.	Investment proposal and feasibility study	3, 4, 5, 6, 7	Listen to lectures and read literature. The exercises demonstrate how to solve tasks. Solve exercises.	At the colloquium or the written / oral exam define Investment proposal and feasibility study	10 h

	10.	Security of computer networks and distributed systems	3, 4, 5, 6, 7	Listen to lectures and read literature. The exercises demonstrate how to solve tasks. Solve exercises.	At the colloquium or the written / oral exam define Security of computer networks and distributed systems	10 h	
	11.	Systems for the detection of security breach (IDS)	3, 4, 5, 6, 7	Listen to lectures and read literature. The exercises demonstrate how to solve tasks. Solve exercises.	At the colloquium or the written / oral exam define Systems for the detection of security breach (IDS)	11 h	
	12.	Managing and monitoring the security system (ISMS); Legal and Ethical Aspects of Security	3, 4, 5, 6, 7	Listen to lectures and read literature. The exercises demonstrate how to solve tasks. Solve exercises.	At the colloquium or the written / oral exam define anaging and monitoring the security system (ISMS); Legal and Ethical Aspects of Security	11 h	
	13.	Managing security incidents and business continuity	3, 4, 5, 6, 7	Listen to lectures and read literature. The exercises demonstrate how to solve tasks. Solve exercises.	At the colloquium or the written / oral exam define anaging security incidents and business continuity	10 h	
	14.	Defense and presentation of the seminar, recurrence of colloquia	1, 2, 3, 4, 5, 6, 7	Write the colloquium.	-	10 h	
	15.	Defense and presentation of the seminar, recurrence of colloquia		Listen to lectures and read literature.	-	10 h	

3. EVALUATION OF STUDENTS` WORK

3.1. Students` obligations	In accordance with the Regulations on Studying and the Regulations onStudentAssessment and Evaluation: for all full-time students attendance of at least 70%. Part-time students are required to attend classes at least50%.All students are required to carry calculator and formulae list. Students who have during the course achieved: • from 0 - 24,9% ECTS credits- are rated F (unsuccessful) and cannot obtain ECTS credits, and must re-enroll in the next academic year; • from 25 - 49,9% - are assessed by FX (insufficient) and must pass the written exam (test). Written exam (test) can be held in a regular or extraordinary exam period; • more than 50% - students have the right to take the final exam. Students cantake the final exam from the course in two ways: a) during the course ofteaching through continuous monitoring of students (active participationin classes and through two colloquia); b) by passing the exam (writtenand oralpart of the exam).					
3.2. Monitoring student work (enter the share of ECTS credits for each activity so that the total number of ECTS points corresponds to the credit score of the course)	Attendance	0,5	Written exam	2,0 (without colloquia)	Project	
	Experimental work		Research		Practical work	
	Essay		Report		Continuous examination	
	Colloquium	2,0 (without written exam)	Seminar paper	0,5	Other	
	Class activity		Oral exam	1,0	Other	
3.3. Student workload	Student workload on all bases for 1 ECTS credit is 30 hours in a semester and is estimated as: Attending classes and exercises 60 hours Preparing colloquia or exams through individual work 60 hours					

4. GRADING SYSTEM

4.1. Grading seminar papers	

4.2. Grading colloquia/ written and oral exam	**Unsatisfactory**	**Satisfactory**	**Above average**
	Responds by memory, without a deeper understanding. Does not know or apply basic terms and concepts. Does not know how to apply or explain the contents of the course with examples.	Reproduces the basic concepts and without difficulty imparts new knowledge, understands the material, explains the terms and concepts supported with examples.	Knowledge is at the level of analysis, synthesis and evaluation. Observes the principles, accurately and thoroughly explains the content of the material, and logically connects and explains the terms and concepts supported with examples. Finds solutions that were not originally given. Notes correlations with related material.

4.3. Final grade according to evaluation elements					
	Active course attendance	70-74,9% of attendance	75-79,9% of attendance	80-89,9% of attendance	90-100% of attendance
		2 points	5 points	10 points	20 points
	Colloquia/ Written exam	2	3	4	5
		50-64,9%	65-79,9%	80-89,9%	90-100%
		25 points	30 points	35 points	40 points
	Oral exam	2	3	5	5
		25 points	30 points	35 points	40 points

4.3. Final grade according to absolute division	Percentage of acquired knowledge, skills and competences (teaching + final exam)	Numerical grade	ECTS grade
	90 – 100%	5 (excellent)	A
	80 – 89,9%	4 (very good)	B
	65 – 79,9%	3 (good)	C
	60 – 64,9%	2 (satisfactory)	D
	50 – 59,9%	2 (satisfactory)	E

5. ADDITIONAL COURSE INFORMATION

5.1. Compulsory literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	Bruce Schneier (1996.), Applied Cryptography B. Schneier John Wiley & Sons 1996, John Wiley & Sons, Inc		

	BS ISO/IEC 17799:2005, BS 7799-1:2005 norma: information technology, security techniques, code of practice for information security management. BSI, UK. Charles P. Pfleger (1997.), Security in Computing, Prentice Hall			
5.2. Additional literature (at the moment of changes and/or amended of study programme)	Teaching material and exercises Harold F. Tipton, Micki Krause (2000.), Information Security Management Handbook, CRC Press LLC			
5.3. Quality assurance methods that ensure the acquisition of knowledge, skills and competences	The control of students' work quality and the acquisition of necessary knowledge and skills will be ensured through interactive work. By keeping track of attendance and student activity during classes and provided information on students` progress through short colloquiums and homework, information for further guidance to students will be provided in order to increase the efficiency of their work. Students will be informed about their rights and obligations as well as the methods of work and the required literature. Indicators of quality assurance system: Student survey, monitoring of annual data from the Croatian employment service on the annual state of student employment, surveys from employers and Alumni association.			
5.4. Informing about the course and contacting the teacher	It is the responsibility of each student to be regularly informed about the course, the coursework, and the classroom activities. All notices of classes or possible adjournment will be published in a timely manner on the e-learning site of the course and on the website of the Polytechnic. Students can contact teachers during the consultation period (at least one hour per week), while for short questions and explanations they can be contacted during class. It is also possible to ask questions by e-mail (from the official e-mail address at @ vus.hr), which will be answered as soon as possible (no later than five working days after receiving the e-mail).			

4. GENERAL COURSE INFORMATION			
1.1. Course title	**Computer Networks**	1.8. Course code in ISVU	
1.2. Course lecturer	Zvonimir Klarin	1.9. Course code in MOZVAG	
1.3. Assistants and/or associates	Zvonimir Klarin, mag.ing.comp, teaching assistant	1.10. Forms of teaching (number of hours Lecturing +Practical exercises + Seminars + e learning)	(30+30+0+0)
1.4. Study program (specialist, undergraduate, graduate)	**Undergraduate Professional Study Business Informatics**	1.11. Level of e- learning application (1st, 2nd, 3rd level), percentage of on line course performance (max. 20%)	1st, course materials are on-line, 0%
1.5. Course status (mandatory, elective)	Mandatory	1.12. Number of course revisions	2.
1.6. Year of study	2nd	1.20. Modernization	Yes
1.7. Credit score (ECTS)	4	1.14. Percentage estimate of course changes and/or supplements	Less than 20% X□ More than 20 % □

2. COURSE DESCRIPTION	
2.1. Course objectives	Gain higher level knowledge of networking technologies, transmission media, network devices and standards. Students will apply the acquired knowledge in a simulated network environment.
2.2. Terms of course entry and required competences	Completed a four-year high school education; possession of a qualification at level 4.2 according to the CROQF. The condition for access to the exam is passing the course Introduction to Computer Networks.

2.3. . Learning outcomes on the study program level	LO1: Analyze the situation, identify opportunities and anticipate the problems encountered by organizations and individuals in the application of information technologies LO5: Interpret mechanisms of data flow control, error control and fragmentation, ways of multiplexing data transmission using routing methods in computer networks LO11: Link the activities of building and maintaining information system with the needs of clients and users LO13: Rank security threats and select appropriate countermeasures to protect the information system

2.4. Expected learning outcomes on the course level	**Learning outcomes** according to the Bloom`s taxonomy: (up to two verbs per LO)	**Level of LO:** *1- remembering, 2- understanding, 3- application, 4-analysis, 5-evaluation, 6-synthesis*
	20. Define and distinguish the basic concepts of networking technologies.	1,4
	21. Describe and distinguish data transmission standards.	2
	22. Evaluate and distinguish different network devices when configuring a network.	4, 5
	23. Configure network access.	4
	24. Define virtual networks.	1
	25. Assess the security of computer network elements.	4,5

2.5. Course content according to detailed curriculum schedule

Constructive allignament

no	Thematic unit	LO of the course	Content/teaching methods	Evaluation	Time
106.	Introduction to the course and detailed curriculum	1	Listen to lectures. During the exercises, get acquainted with the content of the course and documents on the e-learning platform of the course.	-	4 h
107.	Internet, WAN and routers	1	Listen to lectures. During the exercises, through independent work get acquainted with the thematic unit.	Explain the Internet globally.	4 hi
108.	Router configuration	1,2	Listen to lectures. During the exercises, through independent work get acquainted with the thematic unit.	Configure a simple router.	4 h
109.	Discovering and connecting new network devices	3	Listen to lectures. During the exercises, through independent work get acquainted with the thematic unit.	Connect different network devices	4 h
110.	Router operating system	2	Listen to lectures. During the exercises, through independent work get acquainted with the thematic unit.	Know the basics of router operating system.	4 h
111.	Routed and routing protocols	1, 2, 3	Listen to lectures. During the exercises, through independent work get acquainted with the thematic unit.	Distinguish and explain various communication protocols.	4 h

	112.	TCP/IP control messages	2	Listen to lectures. During the exercises, through independent work get acquainted with the thematic unit.	Explain the purpose of acknowledgement messages.	4 h
	113.	TCP and UDP operations	2	Listen to lectures. During the exercises, through independent work get acquainted with the thematic unit.	Distinguish different data traffic.	4 h
	114.	Access to network resources – Access-control lists	4	Listen to lectures. During the exercises, through independent work get acquainted with the thematic unit.	Define access-control lists.	4 h
	115.	OSPF and EIGRP protocols	2	Listen to lectures. During the exercises, through independent work get acquainted with the thematic unit.	Explain routing protocols.	4 h
	116.	Managed network switch	4, 5	Listen to lectures. During the exercises, through independent work get acquainted with the thematic unit.	Configure a managed network switch.	8 h
	117.	Virtual LAN	4, 5	Listen to lectures. During the exercises, through independent work get acquainted with the thematic unit.	Configure a virtual network.	4 h
	118.	WAN technologies	2	Listen to lectures. During the exercises, through independent work get acquainted with the thematic unit.	Distinguish technologies for transferring large amounts of data.	4 h
	119.	Network management	1,2	Listen to lectures, read literature, and prepare individually for the colloquium.	Manage and monitor network elements.	4 h
	120.	Concluding remarks and preparation for the exam	6	Listen to lectures and prepare for the exam individually.	-	60 h

3. EVALUATION OF STUDENTS` WORK

3.1. Students` obligations	In accordance with the Regulations on Studying and the Regulations on Student Assessment and Evaluation: for all full-time students attendance of at least 70%. Part-time students are required to attend classes at least 50%. Students who have during the course achieved: • from 0 - 24,9% ECTS credits- are rated F (unsuccessful) and cannot obtain ECTS credits, and must re-enroll in the next academic year; • from 25 - 49,9% - are assessed by FX (insufficient) and must pass the written exam (test). Written exam (test) can be held in a regular or extraordinary exam period; • more than 50% - students have the right to take the final exam. Students can take the final exam from the course in two ways: a) during the course of teaching through continuous monitoring of students (active participation in classes); b) by passing the exam (written and oral part of the exam).

3.2. Monitoring student work (enter the share of ECTS credits for each activity so that the total number of ECTS points corresponds to the credit score of the course))						
	Attendance	0,5	Written exam	2	Project	
	Experimental work		Research		Practical work	
	Essay		Report		Continuous examination	1
	Colloquium		Seminar paper		Other	
	Class activity	0,5	Oral exam	1	Other	

3.3. . Student workload	Student workload on all bases for 1 ECTS credit is 30 hours in a semester and is estimated as: 1. Attending classes and exercises 60 hours 2. Preparing colloquia or exams through individual work 60 hours

4. FORMIRANJE OCJENE

4.1. Grading seminar papers	-

4.2. Grading colloquia/ written and oral exam

Unsatisfactory	Satisfactory	Above average
Responds by memory, without a deeper understanding. Does not know or apply basic terms and concepts. Does not know how to apply or explain the contents of the course with examples.	Reproduces the basic concepts and without difficulty imparts new knowledge, understands the material, explains the terms and concepts supported with examples.	Knowledge is at the level of analysis, synthesis and evaluation. Observes the principles, accurately and thoroughly explains the content of the material, and logically connects and explains the terms and concepts supported with examples. Finds solutions that were not originally given. Notes correlations with related material.

4.3. Final grade according to evaluation elements

Active course attendance	70-74,9% of attendance	75-79,9% of attendance	80-89,9% of attendance	90-100% of attendance
	2 points	5 points	10 points	20 points
Colloquia/ Written exam	2	3	4	5
	50-64,9%	65-79,9%	80-89,9%	90-100%
	25 points	30 points	35 points	40 points
Oral exam	2	3	5	5
	25 points	30 points	35 points	40 points

4.4. Final grade according to absolute division

Percentage of acquired knowledge, skills and competences (teaching + final exam)	Numerical grade	ECTS grade
90 – 100%	5 (excellent)	A
80 – 89,9%	4 (very good)	B
65 – 79,9%	3 (good)	C
60 – 64,9%	2 (satisfactory)	D
50 – 59,9%	2 (satisfactory)	E

5. ADDITIONAL COURSE INFORMATION			
5.1. Compulsory literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	8. Cisco Certified Network Associate (CCNA), CISCO, 2012. 9. Computer Networks (5th edition),Tanenbaum,Wetherall,2011		Available on the e-learning page of the course
5.2. Additional literature (at the moment of changes and/or amended of study program)			
5.3. Quality assurance methods that ensure the acquisition of knowledge, skills and competences	The control of students' work quality and the acquisition of necessary knowledge and skills will be ensured through interactive work. By keeping track of attendance and student activity during classes and provided information on students` progress through short colloquiums and homework, information for further guidance to students will be provided in order to increase the efficiency of their work. Students will be informed about their rights and obligations as well as the methods of work and the required literature. Indicators of quality assurance system: Student survey, monitoring of annual data from the Croatian employment service on the annual state of student employment, surveys from employers and Alumni association.		
5.4. Informing about the course and contacting the teacher	It is the responsibility of each student to be regularly informed about the course, the coursework, and the classroom activities. All notices of classes or possible adjournment will be published in a timely manner on the e-learning site of the course and on the website of the Polytechnic. Students can contact teachers during the consultation period (at least one hour per week), while for short questions and explanations they can be contacted during class. It is also possible to ask questions by e-mail (from the official e-mail address at @ vus.hr), which will be answered as soon as possible (no later than five working days after receiving the e-mail).		

1. GENERAL INFORMATION ABOUT THE SUBJECT			
1.1. Title	**Digital Marketing and Marketing Analytics**	1.8. ISVU course code	
1.2. Lecturer	Jelena Šišara	1.9. MOZVAG course code	
1.3. Assistants and/or associates		1.10. Forms of teaching (number of hours Lecturing +Practical exercises + Seminars + e learning)	(30+0+15+0)
1.4. Study programme (specialist, undergraduate, graduate)	**Undergraduate professional study of Business Informatics**	1.11. Level of e- learning application (1st, 2nd, 3rd level), percentage of on line course performance (max. 20%)	3rd level - materials available on-line, taking a colloquium and a written exam on a computer
1.5. Course status (mandatory, elective)	Elective	1.12. Number of course revisions	2.
1.6. Study year	3rd	1.13. Modernization	■ yes no
1.7. Credit score (ECTS)	4	1.14. Percentage estimate of course changes and/or supplements	Less than 20% ■ More than 20 % □

2. COURSE DESCRIPTION	
2.1. Course objectives	Master the basics of marketing and the specifics of digital marketing, get acquainted with digital marketing activities, learn about the role of data in digital marketing, learn to analyze data, learn to choose the right tactics of digital marketing, evaluate different channels used in campaigns and to create and implement digital marketing plan.
2.2. Terms of course entry and required competences	Completed four-year high school education; possession of a qualification at level 4.2 according to the CROQF.
	IU4 Evaluate various digital channels in marketing campaigns and create and implement a digital marketing plan

2.3. Learning outcomes on the study programme level	IU9 Select appropriate professional literature in Croatian and foreign languages, prepare and independently hold presentations in Croatian and foreign language to professional and general audiences, and critically evaluate presented professional topics
	IU15. Compare and select appropriate development tools at the professional level

2.4. Expected learning outcomes on the course level	**Learning outcomes** towards Bloom's taxonomy: (up to two verbs per LO)	**LO Level:** *43. Recapture,* *44. Understanding,* *45. Application,* *46. Analysis,* *47. Evaluation,* 48. *Synthesis*
	1. Master the basics and specifics of digital marketing	1,2,3,4,5,6
	2. Get acquainted with digital marketing activities	2,3,4,5,6
	3. Get to know the role of data in digital marketing	2,3,4,5,6
	4. Learn to analyze data	2,3,4,5,6
	5. Learn to choose the right digital marketing tactics	2,3,4,5,6
	6. Evaluate the different channels used in the campaigns	2,3,4,5,6
	7. Create and implement a digital marketing plan	2,3,4,5,6

2.5. Course content according to detailed curriculum schedule

Constructive alignment

No:	Thematic ensemble / Lecture Topic	Course LO	Content / Teaching Method	Evaluation	Time needed
121.	Introduction to the course and detailed performance plan of teaching.	-	Listen to lectures.	-	2 hours
	Marketing yesterday, today and tomorrow	1	Listen to lectures, work on computers, read literature.	Describe essential digital marketing standards in the context of historical development Interpret the basics of digital marketing	8 hours
122.	Overview of basic marketing activities	1,2,3,4	Listen to lectures, work on computers, read literature.	Explain basic marketing activities	5 hours
123.	Digital marketing specifics	1,2,3	Listen to lectures, work on computers, read literature.	Evaluate the specifics of digital marketing	5 hours
124.	Digital marketing activities management	1,2,3,4	Listen to lectures, work on computers, read literature.	Manage digital marketing activities	5 hours
125.	Digital marketing activities management	1,2,3,4,5,6	Listen to lectures, work on computers, read literature.	Manage digital marketing activities	5 hours
126.	Data as the basis of digital marketing	1,2,3,4,5,6	Listen to lectures, work on computers, read literature.	Analyze a data set on a computer for application purposes in digital marketing activities	5 hours
127.	Data as the basis of digital marketing	3,4,5,6	Listen to lectures, work on computers, read literature.	Analyze a data set on a computer for application purposes in digital marketing activities	5 hours
128.	Segmentation and targeting of customers	3,4,5,6	Listen to lectures, work on computers, read literature.	Create customer segmentation. Specify target groups of customers	10 hours

	129.	Segmentation and targeting of customers	1,2,3,4,5,6,7	Listen to lectures, work on computers, read literature.	Create customer segmentation. Specify target groups of customers	10 hours
	130.	Creating and evaluating a digital sales funnel	1,2,3,4,5,6,7	Listen to lectures, work on computers, read literature.	Create a digital sales funnel.	10 hours
	131.	Creating and evaluating a digital sales funnel	1,2,3,4,5,6,7	Listen to lectures, work on computers, read literature.	Rate the digital sales funnel.	10 hours
	132.	Omnichannel and its measurement	1,2,3,4,5,6,7	Listen to lectures, work on computers, read literature.	Explain Omnichannel approach to the customer	10 hours
	133.	Omnichannel and its measurement	1,2,3,4,5,6,7	Listen to lectures, work on computers, read literature.	Measure Omnichannel activities	10 hours
	134.	Differences between digital sales and digital marketing	1,2,3,4,5,6,7	Listen to lectures, work on computers, read literature.	Identify key differences between digital sales and digital marketing	10 hours
	135.	Project Presentation	1,2,3,4,5,6,7	Listen to lectures, work on computers, read literature, individual preparing for exam.	Presentation of the project	10 hours

3. EVALUATION OF STUDENT WORK

3.1. Students` obligations

In accordance with the Book of Rules and the Rulebook on Student Assessment and Evaluation: for all regular students attend at least 70% attendance. Part-time students have the obligation to attend at least 50% of lectures. All students must create, present and positively colloquy seminar paper.

Students who have during the course achieved:

- From 0 – 24,9% ECTS credits- is rated F (unsuccessful) and cannot get ECTS credits and must re-enrol the subject in the next academic year;
- From 25 – 49,9% ECTS credits - is rated FX (inadequate) and has to come out and pass the test (exam). A written exam can be held in a regular or extraordinary exam period;
- More than 50% ECTS credits - students have the right to access the final exam of the subject.

Students can take the final exam in the course in two ways: a) during teaching through continuous monitoring of students (active participation in classes and exercises and two exams); b) during class (active participation in classes and exercises) and passing exams (written and oral examinations).

3.2. Monitoring student work (enter the share of ECTS credits for each activity so that the total number of ECTS points corresponds to the credit score of the course)

Attendance	1	Written exam	1 (no colloquiums)	Project	
Experimental work		Research		Practical work	
Essay		Report		Continuous examination	
Colloquium	2 (no written and oral exam)	Seminar paper	1	Other (inscribe)	
Class activities		Oral exam	1 (no colloquiums)	Other (inscribe)	

3.3. Student workload

The student's workload on all bases amounts to 1 ECTS point for 30 hours of work per semester and is estimated as:

Commitment	***Hours (estimate)***
27. Attending classes	40

	28. Practical work	40
	29. Preparation for the Colloquium / exam through self-study	40

4. GRADING

4.1. Seminar paper grading

4.2. Colloquium / exam grading

Poor	Satisfying	Above average
Give answer by memory, no deeper understanding. Does not know and does not apply the basic terms and concepts. Cannot apply or explain the contents of the course.	Reproduces basic terms, without difficulty transfers new knowledge, understands subject matter, explains the terms and the notions that substantiate by examples.	Knowledge is at the level of analysis, synthesis and evaluation. It observes legitimacy, accurately and thoroughly explains the content of the subject, and logically links and explains the terms and concepts that it encapsulates. Find solutions that are not originally given. There is a correlation with correlative subjects.

4.3. Creating a final grade according to evaluation elements

Active participation in the lessons	70-75% of attendance	76-86% of attendance	87-100% of attendance	Created mental map. Solved case study.
	4 points	7 points	10 points	
Seminar paper	2	3	4	5
	5 points	7 points	8 points	10 points
Colloquium / written exam	2	3	4	5
	50-64,9%	65-79,9%	80-89,9%	90-100%
	25 points	30 points	35 points	40 points
Oral exam	2	3	5	5
	25 points	30 points	35 points	40 points

4.4. Creating a final grade according to absolute allocation

Percentage of adopted knowledge, skills and competences (teaching + final exam)	Numerous grade	ECTS grade
90 – 100%	5 (excellent)	A
80 – 89,9%	4 (very good)	B
65 – 79,9%	3 (good)	C
60 – 64,9%	2 (sufficient)	D
50 – 59,9%	2 (sufficient)	E

5. ADDITIONAL INFORMATION ABOUT THE COURSE

5.1. Compulsory literature (available in the library and through other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	1. Peer-reviewed teaching materials in the subject, available on the e-learning system		Available online
	2. J.Pavičić , N. Drašković , V. Gnjidić, Osnove strateškog marketinga, Školska knjiga, 2014.	5	
5.2. Additional literature (at the moment of changes and/or amended of study programme)	3. Penović, A., Cetinić, M., Rašeta, I., Ličina, B., Pobijedite internet ili će internet pobijediti vas, Jasno & Glasno, 2014	5	
5.3. Quality assurance methods that ensure the acquisition of knowledge, skills and competences	The control of students' work quality and the acquisition of necessary knowledge and skills will be ensured through interactive work. By keeping track of attendance and student activity during classes and provided information on students` progress through short colloquiums and homework, information for further guidance to students will be provided in order to increase the efficiency of their work. Students will be informed about their rights and obligations as well as the methods of work and the required literature. Indicators of quality assurance system: Student survey, monitoring of annual data from the Croatian employment service on the annual state of student employment, surveys from employers and Alumni association.		
5.4. information on the course and contact with the teacher	It is obligatory for every student to regularly inform about the course, teaching and teaching activities. All information about teaching or any delay in teaching will be published on the e-learning pages of the course and on the web pages of the Polytechnic. Students can contact the teachers during the consultation term (at least one hour per week), while brief questions and explanations can be addressed during classes. It is possible to ask questions by e-mail (from the official e-mail address from the domain @ vus.hr) that will be answered in a short time (no later than five working days from the receipt of e-mail).		

1. GENERAL INFORMATION ABOUT THE SUBJECT			
1.1. Title	**Operations Research**	1.8. ISVU course code	214382
1.2. Lecturer	Ivana Beljo	1.9. MOZVAG course code	
1.3. Assistants and/or associates		1.10. Forms of teaching (number of hours Lecturing +Practical exercises + Seminars + e learning)	(30+30+0+0)
1.4. Study programme (specialist, undergraduate, graduate)	**Professional Undergraduate Study of Business Informatics**	1.11. Level of e- learning application (1st, 2nd, 3rd level), percentage of on line course performance (max. 20%)	1st – materials available On-line, (lectures recorded) 20%
1.5. Course status (mandatory, elective)	Mandatory	1.12. Number of course revisions	0.
1.6. Study year	3	1.13. Modernization	□ yes ■ no
1.7. Credit score (ECTS)	4	1.14. Percentage estimate of course changes and/or supplements	Less than 20% □ More than 20 % □

2. COURSE DESCRIPTION	
2.1. Course objectives	.The aim of this course is to train students in use of quantitative methods for decision making: • Creating mathematical models of various business problems; • Finding best method for getting optimal solution based on model; • Evaluate solution and perform sensitivity analysis; • Apply the learned content of this course in business practice.
2.2. Terms of course entry and required competences	Four-year high school education completed; having a qualification at level 4.2 Finished courses: Mathematics, Business Statistics

2.3. Learning outcomes on the study programme level	LO2. Evaluate and define steps in planning, decision making, operations and control then applying computer aided business and manufacturing LO7. Select and use quantitative/mathematical methods, models and techniques appropriate for solving problems from informatics and business domain. LO9. To individually and responsibly search and select relevant literature in Croatian and foreign languages, prepare papers and presentations for general and professional audience and critically evaluate presented professional topics. LO14. Successfully communicates with clients, users and colleagues, both verbal and in writing, using suitable terminology, what also includes ability to communicate in foreign language about professional topics. LO15. Compare and select suitable development tools from professional viewpoint. LO16. Evaluate deciding factors that have impact on businesses and individual and apply basic methods and concepts of planning, managing and auditing business.	
2.4. Expected learning outcomes on the course level	**Learning outcomes** towards Bloom's taxonomy: (up to two verbs per LO)	**LO Level:** *49. Recapture,* *50. Understanding,* *51. Application,* *52. Analysis,* *53. Evaluation,* 54. *Synthesis*
	1. Recognize and analyze problems from the business domain which can be solved by linear programming.	2,3
	2. Design linear programming model for recognized problems.	3,4
	3. Apply Simplex method for solving common problems in business.	3,4
	4. Present advantages and limitations of methods and techniques for linear programming on given problem.	4,5
	5. Apply streamlined Simplex method on specific business problems (transport, assignment, stock control, scheduling, network etc.	3,4
	6. Understand and apply different approach in decision making based on problem characteristics.	2,3
	7. Use software tools (Excel add-ins) for creating and solving linear, non-linear and integer problems.	3
	8. Recognize biases and fallacies that impact rationality of decision maker and avoid them.	2,3
	9. Evaluate and interpret results of model solving and perform sensitivity analysis for common problems met in the business.	4,5

2.5. Course content according to detailed curriculum schedule	**Constructive alignment**					
	No:	**Thematic ensemble / Lecture Topic**	**Course LO**	**Content / Teaching Method**	**Evaluation**	**Time needed**
	136.	Introduction to Operations Research.	1,2	Listen to the lecture and read the literature.	Checked by written test and oral exam: student can estimate influence of technology development on capabilities and performance of computers.	2 hours
	137.	Linear problems, mathematical model and geometric visualization.	1,2,3	Listen to the lecture, read the literature and solving exercises.	-"- : student can create mathematical model of common linear problem	6 hours

	138.	Simplex method	1,2,3	Listen to the lecture + solving exercises using computer tools.	-"- : student designs and solves model of the given problem	8 hours
	139.	Solving linear problems in Excel	2,3,4,7	Listen to the lecture + solving exercises using computer tools.	-"- : student designs and solves model of the given problem	10 hours
	140.	Post-optimal analysis, sensitivity and shadow price	2,3,4,7,9	Listen to the lecture + solving exercises using computer tools.	-"- : student evaluate results of model solution	8 hours
	141.	Special cases of linear problems, transport problems	1,2,4,5,6,7	Listen to the lecture + solving exercises using computer tools.	-"- : student designs and solves model of the given problem	10 hours
	142.	Problem of assignation, modelling in Excel	1,2,4,5,6,7	Listen to the lecture + solving exercises using computer tools.	-"- : student designs and solves model of the given problem	8 hours
	143.	Network models: Minimum Price Maximal Flow Problem	1,2,4,5,6,7	Listen to the lecture + solving exercises using computer tools.	-"- : student designs and solves model of the given problem	10 hours
	144.	Network models for project management.	1,2,4,5,6,7	Listen to the lecture + solving exercises using computer tools.	-"- : student designs and solves model of the given problem	8 hours
	145.	Dynamic programming	4,5,6	Listen to the lecture + solving exercises using computer tools.	-"- : student designs and solves model of the given problem	8 hours
	146.	Integer programming in Excel	4,5,6,7,8	Listen to the lecture + solving exercises using computer tools.	-"- : student designs and solves model of the given problem	8 hours
	147.	Decision-making theory: Decisions tree.	4,5,6,7,8	Listen to the lecture + solving exercises using computer tools.	-"- : student designs and solves model of the given problem	10 hours
	148.	Methods for solving nonlinear problems in Excel	6,7,8,9	Listen to the lecture + solving exercises using computer tools.	-"- : student designs and solves model of the given problem	8 hours
	149.	Selecting best methods for solving common business problems	4,5,6,7,9	Listen to the lecture + solving exercises using computer tools.	Checked by oral exam: Student can select optimal method for modelling given business problem and understand it's advantages and limitations	8 hours
	150.	Common fallacies in decision making	8,9	Listen to the lecture and individual preparation for the exam.	Checked by oral exam: Student recognises common fallacies and biases in decision making	8 hours

3.1. Students` obligations	In accordance with the Book of Rules and the Rulebook on Student Assessment and Evaluation: for all regular students attend at least 70% attendance. Part-time students have the obligation to attend at least 50% of lectures through physical presence or via on-line attendance. Students who have during the course: • satisfied minimal attendance condition, may approach colloquium or written exam. • past 50% score from all colloquium or from written exam (exam can be held in a regular or extraordinary exam period) may approach final oral exam • past both written and oral exams receive grade and all ECTS credits for that course

	Attendance	0.4	Written exam	1.6 (by submitting both colloquiums the student is	Project	

<table>
<tr><td rowspan="5">3.2. Monitoring student work (enter the share of ECTS credits for each activity so that the total number of ECTS points corresponds to the credit score of the course)</td><td></td><td></td><td></td><td>relieved of an written examination)</td><td></td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Research</td><td></td><td>Practical work</td><td></td></tr>
<tr><td>Essay</td><td></td><td>Report</td><td></td><td>Continuous examination</td><td></td></tr>
<tr><td>Colloquium</td><td>3 (by submitting both colloquiums the student is relieved of a written and oral examination)</td><td>Seminar paper</td><td></td><td>Other (inscribe)</td><td></td></tr>
<tr><td>Class activities</td><td>0.4</td><td>Oral exam</td><td>1.6 (by submitting both colloquiums the student is relieved of an oral examination)</td><td>Other (inscribe)</td><td></td></tr>
<tr><td>3.3. Student workload</td><td colspan="6">The student's workload on all bases amounts to 1 ECTS point for 30 hours of work per semester and is estimated as:
<table>
<tr><th>Commitment</th><th>Hours (estimate)</th></tr>
<tr><td>30. Attending classes</td><td>45</td></tr>
<tr><td>31. Creating and Presenting seminar paper</td><td>10</td></tr>
<tr><td>32. Preparation for the Colloquium / exam through self-study</td><td>65</td></tr>
<tr><td></td><td></td></tr>
</table></td></tr>
<tr><td colspan="7">4. GRADING</td></tr>
<tr><td>4.1. Seminar paper grading</td><td colspan="6"></td></tr>
<tr><td>4.2. Colloquium / exam grading</td><td colspan="6"><table>
<tr><th>Poor</th><th>Satisfying</th><th>Above average</th></tr>
<tr><td>Give answer by memory, no deeper understanding. Does not know and does not apply the basic terms and concepts. Cannot apply or explain the contents of the course.</td><td>Reproduces basic terms, without difficulty transfers new knowledge, understands subject matter, explains the terms and the notions that substantiate by examples.</td><td>Knowledge is at the level of analysis, synthesis and evaluation. It observes legitimacy, accurately and thoroughly explains the content of the subject, and logically links and explains the terms and concepts that it encapsulates. Find solutions that are not originally given. There is a correlation with correlative subjects.</td></tr>
</table></td></tr>
</table>

4.3. Creating a final grade according to evaluation elements	Active participation in the lessons	70-75% of attendance	76-86% of attendance	87-100% of attendance	Activity in class
		2 points	5 points	10 points	+10 points
	Colloquium / written exam	2	3	4	5
		50-64,9%	65-79,9%	80-89,9%	90-100%
		25 points	30 points	35 points	40 points
	Oral exam	2	3	5	5
		25 points	30 points	35 points	40 points

4.4. Creating a final grade according to absolute allocation

Percentage of adopted knowledge, skills and competences (teaching + final exam)	Numerous grade	ECTS grade
88 – 100%	5 (excellent)	A
78 – 87.9%	4 (very good)	B
62 – 77.9%	3 (good)	C
50 – 61,9%	2 (sufficient)	D
0 – 49.9%	1 (unsufficient)	F

5. ADDITIONAL INFORMATION ABOUT THE COURSE

	Title	Number of copies in the library	Availability via other media
5.1. Compulsory literature (available in the library and through other media)	1. Kalpić D., Mornar V., Operacijska istraživanja, DRIP, Zagreb 1996. 2. Hillier F., Lieberman G. : Introduction to operations Research, McGraw Hill 8th ed. 2005, 3. Ragsdale C., Spreadsheet Modeling & Decision Making, Thompson South-Western, 5th ed., 2008	5 1 1	- On-line, pdf On-line, pdf
5.2. Additional literature (at the moment of changes and/or amended of study programme)	10. Swift L., Piff S.: Quantitative Methods for Business, Menagement and Finance, Palgrave, 3rd Ed. 11. Bradley, Hax, and Magnanti : Applied Mathematical Programming, Addisson-Wesley, 1977	1 1	- On-line, pdf
5.3. Quality assurance methods that ensure the acquisition of knowledge, skills and competences	The control of students' work quality and the acquisition of necessary knowledge and skills will be ensured through interactive work. By keeping track of attendance and student activity during classes and provided information on students` progress through short colloquiums and homework, information for further guidance to students will be provided in order to increase the efficiency of their work. Students will be informed about their rights and obligations as well as the methods of work and the required literature. Indicators of quality assurance system: Student survey, monitoring of annual data from the Croatian employment service on the annual state of student employment, surveys from employers and Alumni association.		

1. GENERAL INFORMATION ABOUT THE SUBJECT			
1.1. Title	**Quality Management**	1.8. ISVU course code	142639
1.2. Lecturer	Divna Goleš, Master of Economics, Senior lecturer	1.9. MOZVAG course code	
1.3. Assistants and/or associates	None	1.10. Forms of teaching (number of hours Lecturing +Practical exercises + Seminars + e learning)	(30+0+15+0)
1.4. Study programme (specialist, undergraduate, graduate)	Professional Undergraduate Studies of Management, Department of IT Management	1.11. Level of e- learning application (1st, 2nd, 3rd level), percentage of on line course performance (max. 20%)	1st – materials available On-line, 0%
1.5. Course status (mandatory, elective)	Elective	1.12. Number of course revisions	2.
1.6. Study year	3rd	1.13. Modernization	▪ yes □ no
1.7. Credit score (ECTS)	4	1.14. Percentage estimate of course changes and/or supplements	Less than 20% ▮ More than 20 % □

2. COURSE DESCRIPTION	
2.1. Course objectives	The aim of the collegium is to familiarize students with important terms in the area of Quality Management System and understanding the systems applied to quality management. Furthermore, collegium aims to familiarize, analyse and apply methods and tools that can be used to identify and eliminate non-conformities in the Quality Management System.
2.2. Terms of course entry and required competences	Admission requirements for the 3nd year of study

2.3. Learning outcomes on the study programme level	LO9: Select appropriate professional literature in Croatian and foreign language, prepare and independently present presentations in Croatian and foreign language to expert and general audiences, and critically evaluate the presented professional topics LO16: Valorize the important factors that affect the business of the organization and individuals, and apply the basic methods and concepts of planning, management and accounting of business LO17: Conclude what are the basic principles and methods of quality project management and work successfully in a team	
2.4. Expected learning outcomes on the course level	**Learning outcomes** towards Bloom's taxonomy: (up to two verbs per LO)	**LO Level:** *1. Recapture,* *2. Understanding,* *3. Application,* *4. Analysis,* *5. Evaluation,* 6. *Synthesis*
	1. Explain and critically evaluate key concepts and processes that are important in the Quality Management System	2,5
	2. Analyze the role and importance of quality policy and give a concrete example.	4,6
	3. To analyze the importance of the Quality Management System in modern market conditions	4
	4. To connect the reasons for improving the quality domain, the role of quality cost and quality-based system development.	6
	5. Choose and critically evaluate the appropriateness of selected methods and tools to solve problems in the Quality Management Systems	3,5
	6. Present seminar paper and critically judge the topic covered	6,5

2.5. Course content according to detailed curriculum schedule

Constructive alignment

No:	Thematic ensemble / Lecture Topic	Course LO	Content / Teaching Method	Evaluation	Time needed
1.	Introduction to the course and a detailed performance plan.	-	Listen to the lecture. On seminary teaching, by independent work on the computer students get acquainted with course content and documents on the e-learning course page.	-	4 hours
2.	The basis of the theory of quality.	1,2,6	They listen to a lecture. They read the literature.	At the colloquium or the written and oral exam, they define fundamental insights into quality theory.	6 hours
3.	Interested partners and their integration into the Quality Management System.	1,2,3,6	They listen to a lecture. They read the literature.	At the colloquium or the written and oral exam they define and explain the concepts that occur in this thematic unit.	8 hours
4.	Application of quality management principles.	1,2,3,6	They listen to a lecture, they read the literature, present a seminar paper, followed by a discussion.	At the colloquium or the written and oral exam they define and explain the concepts that occur in this thematic unit.	8 hours

	5.	Strategy, policy, mission, vision and quality goals. Business Systems and Quality Management Systems.	1,2,3,6	They listen to a lecture, work in a team on case work, present a seminar paper, followed by a discussion.	At the colloquium or the written and oral exam they define and explain the concepts that occur in this thematic unit, then they should present and analyze the same on a concrete example.	12 hours
	6.	Business Systems and Quality Management Systems.	1,2,3,6	They listen to a lecture, they read the literature, present a seminar paper, followed by a discussion.	At the colloquium or the written and oral exam they define and explain the concepts that occur in this thematic unit, then they should present and analyze the same on a concrete example.	12 hours
	7.	Documentation in the Quality Management System.	1,2,3,4,6	They listen to a lecture, work in a team on case work, present a seminar paper, followed by a discussion.	At the colloquium or the written and oral exam they define and explain the concepts that occur in this thematic unit, then they should present and analyze the same on a concrete example..	12 hours
	8.	Construction and modelling of business processes.	1,2,3,4,6	They listen to a lecture, work in a team on case work, present a seminar paper, followed by a discussion.	At the colloquium or the written and oral exam they define and explain the concepts that occur in this thematic unit, then they should present and analyze the same on a concrete example.	12 hours
	9.	Standards, guidelines and laws in the Quality Management System, I. colloquium.	2,3,4,6	They listen to a lecture, they read the literature, present a seminar paper, followed by a discussion.	At the colloquium or the written and oral exam they define and explain the concepts that occur in this thematic unit, then they should present and analyze the same on a concrete example.	16 hours
	10.	Concept of continuous improvement of quality.	3,4,5,6	They listen to a lecture, they read the literature, present a seminar paper, followed by a discussion.	At the colloquium or the written and oral exam they define and explain the concepts that occur in this thematic unit, then they should present and analyze the same on a concrete example.	12 hours
	11.	Implementation of auditing and certification process.	3,4,5,6	They listen to a lecture, work in a team on case work, present a seminar paper, followed by a discussion	At the colloquium or the written and oral exam they define and explain the concepts that occur in this thematic unit, then they should present and analyze the same on a concrete example-	12 hours
	12.	Troubleshooting Techniques in the Quality Management System.	3,4,5,6	They listen to a lecture, work in a team on case work, present a seminar paper, followed by a discussion	At the colloquium or the written and oral exam they define and explain the concepts that occur in this thematic unit, then they should present and analyze the same on a concrete example.	12 hours
	13.	Norm 9000 ff. TQM Models (Business Excellence Awards).	3,4,5,6	They listen to a lecture, work in a team on case work, present a seminar paper, followed by a discussion	At the colloquium or the written and oral exam they define and explain the concepts that occur in this thematic unit, then they should present and analyze the same on a concrete example.	12 hours
	14.	Quality Costs.	4,5,6	They listen to a lecture, they read the literature, present a seminar paper, followed by a discussion	At the colloquium or the written and oral exam they define and explain the concepts that occur in this thematic unit, then they should present and analyze the same on a concrete example.	12 hours
	15.	Final lecture, course signatures, II. colloquium	1,2,3,4,5,6	They listen to a lecture and prepare independently for the exam.	At the colloquium or the written and oral exam they define and explain the concepts that occur in this thematic unit.	30 hours

3. EVALUATION OF STUDENT WORK

3.1. Students` obligations

In accordance with the Book of Rules and the Rulebook on Student Assessment and Evaluation: for all regular students attend at least 70% attendance. Part-time students have the obligation to attend at least 50% of lectures. All students must create, present and positively colloquy seminar paper.

Students who have during the course achieved:

- From 0 – 24,9% ECTS credits- is rated F (unsuccessful) and cannot get ECTS credits and must re-enrol the subject in the next academic year;
- From 25 – 49,9% ECTS credits - is rated FX (inadequate) and has to come out and pass the test (exam). A written exam can be held in a regular or extraordinary exam period;
- More than 50% ECTS credits - students have the right to access the final exam of the subject.

Students can pass the final exam in two ways: a) during the course through continuous student attendance (active participation in the lessons, making and presenting the seminar paper, passing two colloquia); b) during the course (active participation in the lessons, creating and presenting the seminar) and passing the exam (written and oral exam).

3.2. Monitoring student work (enter the share of ECTS credits for each activity so that the total number of ECTS points corresponds to the credit score of the course)

Attendance	1	Written exam	2 (by submitting both colloquiums the student is relieved of an written examination)	Project	
Experimental work		Research		Practical work	
Essay		Report		Continuous examination	
Colloquium	3,5 (by submitting both colloquiums the student is relieved of a written and oral examination)	Seminar paper	1	Other (inscribe)	
Class activities	0,5	Oral exam	1,5 (by submitting both colloquiums the student is relieved of an oral examination)	Other (inscribe)	

3.3. Student workload

The student's workload on all bases amounts to 1 ECTS point for 30 hours of work per semester and is estimated as:

Commitment	***Hours (estimate)***
33. Attending classes	60
34. Creating and Presenting seminar paper	15
35. Preparation for the Colloquium / exam through self-study	105

4. GRADING

4.1. Seminar paper grading

Valuation Element	Poor	Satisfying	Above average
Organization	The paper is not organized in a logical order and its structure is lacking.	The paper is well structured with a clear distinction between the introduction, the main part of the text and the conclusion.	The paper is well-structured with a clear distinction between the introduction, the main part of the text and the conclusions that are perfectly logically linked to one another
Terminology, writing style	Words and phrases are low harmonized with official terminology. Writing style is not appropriate, sentences are too long, modest vocabulary, and frequent and repeated grammatical mistakes.	Words and phrases are aligned with official terminology. The writing style is appropriate, the sentence structure is clear, the vocabulary is appropriate and has little grammatical errors.	Words and phrases are aligned with official terminology and show an understanding of their meaning. The writing style is excellent, the sentences are clear and concise, the vocabulary is rich and there are no grammatical errors.
Quoting and referencing	Sources are not specified at all. The references do not match the topic and show a superficial approach to the research topic.	Sources are listed, but incomplete and with errors. The references are appropriate for the subject and show a satisfactory research attitude.	Sources are accurate, complete and consistent. The references are appropriate, their list is "rich" and comprehensive and shows a robust research approach.

4.2. Colloquium / exam grading

Poor	Satisfying	Above average
Give answer by memory, no deeper understanding. Does not know and does not apply the basic terms and concepts. Cannot apply or explain the contents of the course.	Reproduces basic terms, without difficulty transfers new knowledge, understands subject matter, explains the terms and the notions that substantiate by examples.	Knowledge is at the level of analysis, synthesis and evaluation. It observes legitimacy, accurately and thoroughly explains the content of the subject, and logically links and explains the terms and concepts that it encapsulates. Find solutions that are not originally given. There is a correlation with correlative subjects.

4.3. Creating a final grade according to evaluation elements

Active participation in the lessons	70-75% of attendance	76-86% of attendance	87-100% of attendance	Solved case study and project
	2 points	4 points	7 points	3 points
Seminar paper	2	3	4	5
	5 points	7 points	8 points	10 points
Colloquium / written exam	2	3	4	5
	50-64,9%	65-79,9%	80-89,9%	90-100%
	25 points	30 points	35 points	40 points
Oral exam	2	3	5	5
	25 points	30 points	35 points	40 points

4.4. Creating a final grade according to absolute allocation		Percentage of adopted knowledge, skills and competences (teaching + final exam)	Numerous grade	ECTS grade
		90 – 100%	5 (excellent)	A
		80 – 89,9%	4 (very good)	B
		65 – 79,9%	3 (good)	C
		60 – 64,9%	2 (sufficient)	D
		50 – 59,9%	2 (sufficient)	E

5. ADDITIONAL INFORMATION ABOUT THE COURSE

	Title	Number of copies in the library	Availability via other media
5.1. Compulsory literature (available in the library and through other media)	3. Goleš D.(2011). *Upravljanje kvalitetom* script, Veleučilište u Šibeniku, Šibenik		e- learaning
	4. Injac N.(2002). *Mala enciklopedija kvalitete, I dio, Upoznajmo normu ISO 9000*, Oskar, Zagreb, 5. Šiško Kuliš M., Grubišić D.(2010). *Upravljanje kvalitetom*, Sveučilište u Splitu, Ekonomski fakultet, Split, 2010. (selected chapters)	7 2	
5.2. Additional literature (at the moment of changes and/or amended of study programme)	1. Lazibat T.(2009). *Upravljanje kvalitetom* Znanstvena knjiga, Zagreb 2. Injac N.(2001). *Mala enciklopedija kvalitete, Moderna povijest kvalitete*, Oskar, Zagreb 3. Drljača M.(2004).* Mala enciklopedija kvalitete, Troškovi kvalitete* Oskar, Zagreb 4. Injac N.(2002).*Mala enciklopedija kvalitete, Informacije, dokumentacija, auditi*, Oskar, Zagreb 5. Avelini Holjevac I.(2002).* Upravljanje kvalitetom u turizmu i hotelskoj industriji*Fakultet za turistički i hotelski menadžment, Opatija	1 6 3 5 2	
5.3. Quality assurance methods that ensure the acquisition of knowledge, skills and competences	The control of students' work quality and the acquisition of necessary knowledge and skills will be ensured through interactive work. By keeping track of attendance and student activity during classes and provided information on students` progress through short colloquiums and homework, information for further guidance to students will be provided in order to increase the efficiency of their work. Students will be informed about their rights and obligations as well as the methods of work and the required literature. Indicators of quality assurance system: Student survey, monitoring of annual data from the Croatian employment service on the annual state of student employment, surveys from employers and Alumni association.		
5.4. information on the course and contact with the teacher	It is obligatory for every student to regularly inform about the course, teaching and teaching activities. All information about teaching or any delay in teaching will be published on the e-learning pages of the course and on the web pages of the Polytechnic. Students can contact the teachers during the consultation term (at least one hour per week), while brief questions and explanations can be addressed during classes. It is possible to ask questions by e- mail (from the official e-mail address from the domain @ vus.hr) that will be answered in a short time (no later than five working days from the receipt of e-mail).		

1. GENERAL INFORMATION ABOUT THE SUBJECT			
1.1. Title	**Principles of corporate finance**	1.8. ISVU course code	141499
1.2. Lecturer	Jelena Žaja, mag.oec., lec.	1.9. MOZVAG course code	
1.3. Assistants and/or associates		1.10. Forms of teaching (number of hours Lecturing +Practical exercises + Seminars + e learning)	(45+30+0+0)
1.4. Study programme (specialist, undergraduate, graduate)	**Professional Undergraduate Study of Business Management**	1.11. Level of e- learning application (1st, 2nd, 3rd level), percentage of on line course performance (max. 20%)	1st – materials available On-line, 0%
1.5. Course status (mandatory, elective)	Elective	1.12. Number of course revisions	2.
1.6. Study year	3rd	1.13. Modernization	■ yes □ no
1.7. Credit score (ECTS)	6	1.14. Percentage estimate of course changes and/or supplements	Less than 20% ■ More than 20 % □

2. COURSE DESCRIPTION	
2.1. Course objectives	Introduce students with basic concepts of modern financial management through lectures, classroom discussions, business cases and project task solving so that after completing the course each student knows how to approach basic financial management issues and where to look for additional information to solve complex issues that appear in practice in everyday business. To introduce students to the concept of corporate finance, its role in the company's business and to expand their basic knowledge in the field of: • time preferences of money; • measurement of financial risk in function of capital cost; • money markets and capital markets, flows of funds in business processes and the interdependence of property and liabilities management and ways of financing them; • analysis of financial operations of business entities;

	• elements of financial and investment planning; • basis of financial efficiency of investment projects; • financing securities transactions with a special focus on bonds and shares and assessing the justification for investing in financial instruments in the money and capital market; • financing business with own capital; • fundamental laws of debt utilization, capital structure and dividend policy.	
2.2. Terms of course entry and required competences	No conditions.	
2.3. Learning outcomes on the study programme level	LO2: Define and evaluate the processes of thinking, planning, decision-making and management in terms of electronically supported business and production LO6: Correctly write and interpret basic concepts in the field of economics and economics of enterprises, entrepreneurs and entrepreneurship and correctly interpret their interdependencies LO8: Select and apply basic principles of planning and career development in the profession and their own entrepreneurial ventures LO9: Select appropriate professional literature in Croatian and foreign language, prepare and independently present presentations in Croatian and foreign language to expert and general audiences, and critically evaluate the presented professional topics LO14: Communicate successfully with clients, users and colleagues in a verbal and written manner using appropriate terminology including the ability to communicate about the profession in a foreign language LO16: Valorize the important factors that affect the business of the organization and individuals, and apply the basic methods and concepts of planning, management and accounting of business	
2.4. Expected learning outcomes on the course level	**Learning outcomes** towards Bloom's taxonomy: (up to two verbs per LO)	**LO Level:** *55. Recapture,* *56. Understanding,* *57. Application,* *58. Analysis,* *59. Evaluation,* 60. *Synthesis*
	15. to define and categorize basic concepts and tasks of financial management,	1,4
	16. to measure the return and financial risk of the securities portfolio and analyse the relation between risk and return,	3,4
	17. to interpret the financial relations of the enterprise with the financial institutions and the financial market,	4
	18. to evaluate the impact of financial leverage and on the profitability of business entities,	4
	19. to prepare an analysis of financial statements on the example of a business entity by performing horizontal and vertical analysis and analysis by financial indicators,	6
	20. to apply methods of net present value, return period, internal rate of return, profitability index, and assess the eligibility of investment in a project,	3,5
	21. to propose the application of appropriate models and evaluate the value of equity and debt securities,	6,5
	22. use materials and tools to search scientific and professional literature in Croatian and in English, and present accepted knowledge, ideas, problems and solutions independently and in the team.	3,6
2.5. Course content according to detailed curriculum schedule	**Constructive alignment**	

No:	Thematic ensemble / Lecture Topic	Course LO	Content / Teaching Method	Evaluation	Time needed
151.	Introduction to the course and a detailed performance plan.	-	Listen to the lecture. In the exercise classes, by independent work on computer students get acquainted with course content and documents on the e-learning course page.	-	2 hours
	Introductory lecture - basic concepts and determinants of financial management.	1, 3	Listen to the lecture and read the literature.	At the colloquium or the written and oral exam define the basic concepts of financial management. They know how to list and explain basic financial activities, sources of company assets and tasks of financial function in the company. They can explain the role of the Financial Manager, goals of corporation, and agency problem.	8 hours
152.	Financial environment.	1,3	Listen to the lecture and read the literature.	Describe the basic characteristics of the financial market. At the colloquium or the written and oral exam they know how to define and describe the basic securities that circulate in the money market.	6 hours
153.	Time value of money.	1,6	Listen to the lecture and read the literature.	They know how to explain the concept of time value of money and identify the basic variables in calculations of time value of money	10 hours
154.	The Valuation of Long-Term Securities	1, 2,7	Listen to the lecture and read the literature.	They can make distinction among valuation concepts. They know how to valuate long term securities (bond valuation, preferred stock valuation, common stock valuation).	8 hours
155.	Risk and financial management. Balance as a source of financial information.	1, 2,3, 8	Listen to the lecture and read literature. In the exercise classes, they calculate the yield and financial risk of the securities portfolio independently or in a team, and draw conclusions about the risk-return relationship.	At the colloquium or the written and oral exam they can explain the concepts of investment portfolio, financial risk and ways of managing risk. They know how to calculate the expected return, the standard deviation and the coefficient of variation for an individual security or a portfolio of securities and to evaluate the risk of investing on the basis of the relationship between risk and return. They know how to interpret the relationship between security yields and market returns. They know how to explain the concept of a balance sheet, its properties and indicate users of financial information.	8 hours
156.	Financial reports.	1, 3, 8	Listen to the lecture and read the literature.	At the colloquium or the written and oral exam they can state the types of basic financial statements and explain their basic components. Know what can all be a source of cash in a business.	8 hours
157.	Objectives, purpose and methods of analysis of financial reports.	1, 3, 6, 8	They listen to a lecture and read literature. In the exercise classes, independently on a computer, they perform horizontal and vertical analysis of financial statements on the example of a business entity's	At the colloquium or the written and oral exam they can explain the term financial analysis and specify and explain the methods of analysis of financial statements. They know how to explain horizontal and vertical analysis procedures and apply them to	12 hours

				financial statements. They research the content of this thematic area and make a project assignment that presents the knowledge they have acquired and their ideas, and ways to solve problems.	financial statement analysis. Created and presented project assignment (using computer programs).	
	158.	Indicators of financial analysis, examples and interpretations.	1, 5, 6, 8	They listen to a lecture and read literature. In the exercise classes, they calculate financial indicators and interpret the obtained results independently on a computer based on the financial statement of a business entity. They research the content of this thematic area and make a project assignment that presents the knowledge they have acquired and their ideas, and ways to solve problems.	At the colloquium or the written and oral exam they can define and describe the types / groups of financial indicators and apply them in the analysis of financial statements (in the exam and in the preparation of the project assignment). They know how to sketch and interpret Du Pont's indicator system and explain synthetic indicators. Created and presented project assignment (using computer programs).	14 hours
	159.	Rules and principles of financing, liquidity and solvency.	1, 5, 6, 8	They listen to a lecture and read literature. In the exercise classes, independently on a computer, they calculate financial indicators and interpret the obtained results based on the financial statements of a business entity.	At the colloquium or the written and oral exam they can define and describe the basic principles and rules of financing. They know how to explain the difference between the concepts of liquidity and solvency, explain the term financial leverage and judge when it is opportune to use it. They are able to identify internal and external causes of insolvency and propose measures to improve the solvency of companies. Created and presented project assignment (using computer programs).	10 hours
	160.	Short-term asset management.	1, 4, 8	They listen to a lecture and read literature. In the exercise classes, they calculate the value of working capital needed in the company.	At the colloquium or the written and oral exam they can define and describe the notion of working capital, permanent working capital, circular movement of working capital, factors on which the amount of working capital depends, management of working capital, inventory management and receivables management. They know how to analyze the structure of working capital and recommend the optimal size and structure of working capital in a particular company.	8 hours
	161.	Financial planning and methods of assessing the profitability of capital investments.	1, 7, 8	They listen to a lecture and read literature. In the exercise classes, independently on a computer, they apply the methods of capital investment assessment on an example of a financial statement of a business entity and interpret the results	At the colloquium or the written and oral exam they can explain the term financial planning, cash control instruments. They know how to define the term investment and classify investments, identify the common characteristics of all investment projects and explain why the sensitivity analysis of an investment project is done. They know how to explain commonly used methods of evaluating	14 hours

				obtained. They research the content of this thematic area and develop a project assignment that presents the knowledge they have acquired and their ideas, and ways to solve problems.	investment projects, apply them on an example, and make a decision on the profitability of investing in a particular project. Created and presented project assignment (using computer programs).	
	162.	Financial insurance and short term financing.	1, 3, 5, 8	They listen to a lecture and read literature.	At the colloquium or the written and oral exam they can state the types and forms of financing of the company according to the availability of sources, identify differences between credit and equity financing. They know how to explain the four methods and techniques of short-term bank lending, the relative advantages and disadvantages of bank loans, and the factors that determine the amount of trade credit from the point of view of the debtor and creditor.	8 hours
	163.	Mid-term and long-term financing - concepts and practical application.	1, 3, 5, 8	They listen to lectures and read literature, handle case studies.	At the colloquium or the written and oral exam they can define and describe the characteristics of medium and long-term credit. They can explain what leasing financing is (the concept and types of leasing, the advantages and disadvantages of leasing financing); identify differences between operating and financial leasing and recommend when to use what type of leasing.	8 hours
	164.	Equity financing.	1, 5, 8	They listen to a lecture and read literature.	At the colloquium or the written and oral exam they can determine the structure of the financial capital of a joint stock company, they can indicate own and external sources of equity of a joint stock company and explain the way of financing a business with own funds. They know how to explain the notion of non-nominal and nominal capital of a joint stock company, and evaluate the benefits of financing with own capital.	8 hours
	165.	Concluding Considerations / Repeating and Preparing for Exam.				48 hours

3. EVALUATION OF STUDENT WORK	
3.1. Students` obligations	In accordance with the Book of Rules and the Rulebook on Student Assessment and Evaluation: for all regular students attend at least 70% attendance. Part-time students have the obligation to attend at least 50% of lectures. All students must create, present and positively colloquy seminar paper. Students who have during the course achieved: • From 0 – 24,9% ECTS credits- is rated F (unsuccessful) and cannot get ECTS credits and must re-enrol the subject in the next academic year; • From 25 – 49,9% ECTS credits - is rated FX (inadequate) and has to come out and pass the test (exam). A written exam can be held in a regular or extraordinary exam period; • More than 50% ECTS credits - students have the right to access the final exam of the subject.

	Students can pass the final exam in two ways: a) during the course through continuous student attendance (active participation in the lessons, solving case studies, making and presenting the project and passing two colloquia); b) during the course (active participation in the lessons, solving case studies, creating and presenting the project) and passing the exam (written and oral exam).

3.2. Monitoring student work (enter the share of ECTS credits for each activity so that the total number of ECTS points corresponds to the credit score of the course)						
	Attendance	1	Written exam	2,5 (by submitting both colloquiums the student is relieved of an written examination)	Project	0,5
	Experimental work		Research		Practical work	
	Essay		Report		Continuous examination	
	Colloquium	4,5 (by submitting both colloquiums the student is relieved of a written and oral examination)	Seminar paper		Other (inscribe)	
	Class activities		Oral exam	2 (by submitting both colloquiums the student is relieved of an oral examination)	Other (inscribe)	

3.3. Student workload

The student's workload on all bases amounts to 1 ECTS point for 30 hours of work per semester and is estimated as:

Commitment	***Hours (estimate)***
36. Attending classes	75
37. Creating and Project	15
38. Preparation for the Colloquium / exam through self-study	90

4. GRADING

4.1. Seminar paper grading

Valuation Element	**Poor**	**Satisfying**	**Above average**
Organization	The paper is not organized in a logical order and its structure is lacking.	The paper is well structured with a clear distinction between the introduction, the main part of the text and the conclusion.	The paper is well-structured with a clear distinction between the introduction, the main part of the text and the conclusions that are perfectly logically linked to one another
Terminology, writing style	Words and phrases are low harmonized with official terminology. Writing style is not appropriate, sentences are too long, modest vocabulary, and frequent and repeated grammatical mistakes.	Words and phrases are aligned with official terminology. The writing style is appropriate, the sentence structure is clear, the vocabulary is appropriate and has little grammatical errors.	Words and phrases are aligned with official terminology and show an understanding of their meaning. The writing style is excellent, the sentences are clear and concise, the vocabulary is rich and there are no grammatical errors.
Quoting and referencing	Sources are not specified at all. The references do not match the topic and show a superficial approach to the research topic.	Sources are listed, but incomplete and with errors. The references are appropriate for	Sources are accurate, complete and consistent. The references are appropriate,

			the subject and show a satisfactory research attitude.	their list is "rich" and comprehensive and shows a robust research approach.

4.2. Colloquium / exam grading	**Poor**	**Satisfying**	**Above average**
	Give answer by memory, no deeper understanding. Does not know and does not apply the basic terms and concepts. Cannot apply or explain the contents of the course.	Reproduces basic terms, without difficulty transfers new knowledge, understands subject matter, explains the terms and the notions that substantiate by examples.	Knowledge is at the level of analysis, synthesis and evaluation. It observes legitimacy, accurately and thoroughly explains the content of the subject, and logically links and explains the terms and concepts that it encapsulates. Find solutions that are not originally given. There is a correlation with correlative subjects.

4.3. Creating a final grade according to evaluation elements					
	Active participation in the lessons	70-75% of attendance	76-86% of attendance	87-100% of attendance	Solved case study.
		2 points	4 points	7 points	3 points
	Project	2	3	4	5
		5 points	7 points	8 points	10 points
	Colloquium / written exam	2	3	4	5
		50-64,9%	65-79,9%	80-89,9%	90-100%
		25 points	30 points	35 points	40 points
	Oral exam	2	3	5	5
		25 points	30 points	35 points	40 points

4.4. Creating a final grade according to absolute allocation	Percentage of adopted knowledge, skills and competences (teaching + final exam)	Numerous grade	ECTS grade
	90 – 100%	5 (excellent)	A
	80 – 89,9%	4 (very good)	B
	65 – 79,9%	3 (good)	C
	60 – 64,9%	2 (sufficient)	D
	50 – 59,9%	2 (sufficient)	E

5. ADDITIONAL INFORMATION ABOUT THE COURSE			
5.1. Compulsory literature (available in the library and through other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	3. Brealley, R., Myers, S., Marcus, A. (2011). *Principles of Corporate Finance*. McGraw Hill, New York.		On line
	4. Van Horne, J. C., Wachowicz, J.M. (2009). *Fundamentals of Financial Management*. Prentice Hall		On line
5.2. Additional literature (at the moment of changes and/or amended of study programme)			
5.3. Quality assurance methods that ensure the acquisition of knowledge, skills and competences	The control of students' work quality and the acquisition of necessary knowledge and skills will be ensured through interactive work. By keeping track of attendance and student activity during classes and provided information on students` progress through short colloquiums and homework, information for further guidance to students will be provided in order to increase the efficiency of their work. Students will be informed about their rights and obligations as well as the methods of work and the required literature. Indicators of quality assurance system: Student survey, monitoring of annual data from the Croatian employment service on the annual state of student employment, surveys from employers and Alumni association.		
5.4. information on the course and contact with the teacher	It is obligatory for every student to regularly inform about the course, teaching and teaching activities. All information about teaching or any delay in teaching will be published on the e-learning pages of the course and on the web pages of the Polytechnic. Students can contact the teachers during the consultation term (at least one hour per week), while brief questions and explanations can be addressed during classes. It is possible to ask questions by e-mail (from the official e-mail address from the domain @ vus.hr) that will be answered in a short time (no later than five working days from the receipt of e-mail).		

1. GENERAL INFORMATION ABOUT THE SUBJECT			
1.1. Title	**Project management**	1.8. ISVU course code	
1.2. Lecturer	mr.sc. Darko Jureković, sen.lecturer/ PhD. Frane Urem, college prof.	1.9. MOZVAG course code	
1.3. Assistants and/or associates	-	1.10. Forms of teaching (number of hours P+V+S+e-learning)	(30+30+0+0)
1.4. Study programme (professional, specialist, undergraduate, graduate)	**Undergraduate professional study of Business Informatics**	1.11. Level of application of e-learning (level 1,2,3), percentage of online course performance (max. 20%)	Level 3 - materials available online, taking preliminary exams and a final written exam on a computer 0%
1.5. Course status (mandatory, elective)	mandatory	1.12. Number of course revisions	1
1.6. Study year	3	1.13 Modernization	■yes no
1.7. Credit score (ECTS)	4	1.14. Percentage estimate of course changes and/or supplements	Less than 20% More than 20% of □

2. COURSE DESCRIPTION	
2.1. Coourse objectives	To introduce students to the basic methodological approach to project management by engaging during the study of acquired knowledge (management of goals, costs, time, people, quality, procurement, risks) and new techniques, specific to project work
2.2. Terms of course entry and required competences	Completed four-year secondary education; possession of a qualification at level 4.2 according to the Croatian Qualification Framework

2.3. Learning outcomes on the study programme level	IU9 to apply relevant professional literature in Croatian and foreign language, prepare and independently present presentations in Croatian and foreign language for professional and general public, and critically evaluate presented professional topics IU12 to apply key aspects of information technology (programming, algorithms, data structures, databases, and project management in the field of information technology) IU15 to compare and select appropriate development tools at professional level IU17 To conclude what the basic principles and methods of quality project management are and work successfully in a team

2.4. Expected learning outcomes on the course level	**Learning outcomes** towards Bloom's taxonomy: (up to two verbs per LO)	**LO Level:** *1. Recapture,* *2. Understanding,* *3. Application,* *4. Analysis,* *5. Evaluation,* *6. Synthesis*
	1. To know the basic theoretical knowledge in the field of project management	1,2,3,4,5,6
	2. Argue different types of projects	2,3,4,5,6
	3. Identify the lifecycle phases of projects	2,3,4,5,6
	4. Evaluate the role of individual elements of the project system	2,3,4,5,6
	5. Identify and argue the connection of projects with continuous processes and justify the project as a process of achieving the goals.	2,3,4,5,6
	6. Compare different types of projects and explain project lifecycle phases with immediate and indirect economic impacts	2,3,4,5,6

2.5. The contents of the course are elaborated in detail according to the hourly teaching

Constructive alignment

No:	Thematic ensemble / Lecture Topic	Course LO	Content / Teaching method	Evaluation	Time needed
1.	Introduction to project management - organisation of courses/subjects and implementation of teaching.	-	Students listen to the lecture.	-	2 hours
	The beginnings of project management, what we can learn from history, and an overview of available learning content. Understanding concepts: project and project management.	1	Students listen to lectures, they work on a computer, they read literature.	Describe important concepts: project and project/project management.	8 hours
2.	Understanding concepts: methodology, standards, Body of Knowledge, PMBOK and PMI.	1,2,3,4	Students listen to a lecture, they work on a computer, they read literature	Explain important concepts in the field of project management according to methodology and standards: Body of Knowledge, PMBOK and PMI.	10 a.m.

	3.	Understanding concepts: program and portfolio. Distinguishing between goals and deliveries, understanding the term "project scope".	1,2,3	They listen to a lecture, they work on a computer, they read literature	Understanding concepts: program and portfolio. Distinguish the goals and delivery of the project. Explain the term "project scope".	10 a.m.
	4.	Understanding concepts: resources, stakeholders and project roles. The role of project manager.	1,2,3,4	They listen to a lecture, they work on a computer, they read literature	Explain concepts: resources, stakeholders and roles on the project. Explain the role of project manager.	10 a.m.
	5.	Classic and agile approaches to project management. The specificities and specificities of projects in the IT sector.	1,2,3,4,5,6	They listen to a lecture, they work on a computer, they read literature	Evaluate the classic and agile approach of project management. Explain the specificities and specificities of projects in the IT sector.	10 a.m.
	6.	The life cycle of the project and the process view of the project. Forms of organizational structures and projects in different organizations.	1,2,3,4,5,6	They listen to a lecture, they work on a computer, they read literature	Explain the life cycle of the project and the process view of the project. List the forms of organizational structures and projects in different organizations.	10 a.m.
	7.	What is the success of the project? Tips for more successful implementation of projects.	3,4,5,6	They listen to a lecture, they work on a computer, they read literature	Evaluate a successful project.	10 a.m.
	8.	Project launch and project charter. Introduction to project planning.	3,4,5,6	They listen to a lecture, they work on a computer, they read literature	Describe the launch of the project and the charter of the project. Explain the phase of the introduction into project planning.	10 a.m.
	9.	Scope planning and WBS (structural breakdown). Network diagram and project timeline.	1,2,3,4,5,6,	They listen to a lecture, they work on a computer, they read literature	Plan the scope and WBS (structural breakdown) on the example of a simple project. Create a network diagram and a timeline of the example of a simple project.	10 a.m.
	10.	Creating a project budget. Planning a purchase on a project. Project implementation and monitoring/monitoring of performance.	1,2,3,4,5,6	They listen to a lecture, they work on a computer, they read literature	Create a project budget based on the example given. A procurement planner on the project. Explain project monitoring and monitoring procedures.	10 a.m.
	11.	Analysis of acquired value. Quality control. Reporting on the project.	1,2,3,4,5,6	They listen to lectures, they work on a computer, they read literature.	Control of the quality of the project. Create default reports on the example of a simple project.	10 a.m.
	12.	Managing stakeholders and teams. Conflict management.	1,2,3,4,5,6	They listen to a lecture, they work on a computer, they read literature	Describe the procedures for managing stakeholders on the project and project teams. Describe the procedures for managing conflicts on the project.	10 a.m.
	13.	Risk management.	1,2,3,4,5,6	They listen to a lecture, they work on a computer, they read literature	Assess the risks on the example project and draw up a risk management plan.	10 a.m.
	14.	Closing the project. Documenting lessons learned. Project management	1,2,3,4,5,6	They listen to a lecture, they work on a computer, they read literature	Use the Oracle Primavera project management tool.	10 a.m.

		tools: An overview of software tools for project management and the markets/industries in which they are used.				
	15.	Project management as a profession – professional development, certification opportunities and careers in the field of project management. Analysis of case studies.	1,2,3,4,5,6	They listen to a lecture, work on a computer, read literature, individually prepare for the exam	Analyze professional development opportunities in the field of project management. Create and present a default case analysis.	10 a.m.

3. EVALUATION OF STUDENT WORK

3.1. Students` obligations

In accordance with ***the Ordinance on Study*** and ***the Ordinance on evaluation and evaluation of student work***: for all full-time students, attendance at a minimum of 70% in class. Part-time students have an obligation to attend lecture classes at least 50%. All students must create, present and positively colloquiate the seminar paper.
Students who have achieved during class:

- From 0-24.9% of ECTS credits- they are rated F (unsuccessful) and cannot earn ECTS credits, and must re-enter the subject in the next academic year;
- From 25 - 49.9% - they are rated FX (insufficient) and must come out and pass a written exam (test). A written exam (test) may be held within a regular or extraordinary examination period;
- More than 50% - students have the right to access the final exam of the subject.

Students can pass the final exam in the course in two ways: a) during class through continuous monitoring of students (active participation in classes and exercises and two colloquiums); b) during classes (active participation in classes and exercises) and by taking exams (written and oral part of the exam).

3.2. Monitoring student work (enter the share of ECTS credits for each activity so that the total number of ECTS points corresponds to the credit score of the course)

Attendance	1	Written exam	1 (no colloquiums)	Project	
Experimental work		Research		Practical work	1
Essay		Report		Continuous verification	
Colloquium	2 (no written and oral exam)	Seminar paper		(other type)	
Teaching activities		Oral exam	1 (no colloquiums)	(other type)	

3.3. Student workload

The student's workload on all grounds is for 1 ECTS point 30 hours of work per semester and is estimated as:

Obligation	***Hours (estimate)***
1. Attendance	60
2. Practical work on exercises	30
3. Preparation for colloquium/exam through independent learning	30

4. GRADING

4.1. Evaluation of the seminar paper

Valuation Element	Poor	Satisfying	Above average
Organization			
Terminology, writing style			
Quoting and listing references			

4.2. Evaluation of colloquiums / written and oral part of exams

Poor	Satisfying	Above average
The student fits from memory, without a deeper understanding. The student does not know or apply basic terms and concepts. The student does not know how to apply or explain by example the content of the course.	The student reproduces basic concepts and seamlessly transfers new knowledge, understands the material, explains the terms and concepts he/she substantiates with examples.	Knowledge is at the level of analysis, synthesis and evaluation. The student perceives legalities, accurately and thoroughly explains the content of the material and logically connects and explains the terms and concepts it substantiates with examples. The student finds solutions that were not originally given. The student notices correlations with related material.

4.3. Creating a final grade according to evaluation elements

Active attendance	70-75% attendance	76-86% attendance	87-100% attendance	
	4 points	7 points	10 points	
Exercises	2	3	4	5
	5 points	7 points	8 points	10 points
Colloquium / Written exam	2	3	4	5
	50-64,9%	65-79,9%	80-89,9%	90-100%
	25 points	30 points	35 points	40 points
Oral exam	2	3	5	5
	25 points	30 points	35 points	40 points

4.4. Formation of the final assessment on the basis of absolute distribution

Percentage of adopted knowledge, skills and competences adopted (teaching + final exam)	Numerical grade	ECTS grade
90 – 100%	5 (excellent)	A
80 – 89,9%	4 (very good)	B
65 – 79,9%	3 (good)	C
60 – 64,9%	2 (sufficient)	D
50 – 59,9%	2 (sufficient)	E

5. ADDITIONAL INFORMATION ON THE CASE			
5.1. Compulsory literature (available in the library and through other media)	Title	Number of copies in the library	Availability via media
	1. Peer-reviewed teaching materials in the subject, available on the e-learning system		Available online
5.2. Additional literature (at the moment of changes and/or amended of study programme)	1. PMBOK, 6th edition 2. PMBOK, translation of the 4th edition into Croatian 3. Mislav Ante Omazić, Stipe Baljkas; Project management 4. Harold Kerzner; Project Management: A Systems Approach to Planning, Scheduling, and Controlling (12th edition)	5	
5.3. Quality assurance methods that ensure the acquisition of knowledge, skills and competences	Control of the quality of work of students and the acquisition of the necessary knowledge and skills will be ensured through interactive work. Keeping records of student attendance and activities in teaching and obtaining information about student progress through colloquiums will provide the information necessary for further instructions to students in order to increase the efficiency of their work. Students will be informed about their rights and obligations and working methods and the necessary literature. Quality assurance system indicators: Student survey, monitoring of annual data from the HZZZ on the annual employment status of students, surveys of employers and alumni associations.		
5.4. Information on the course and contact with the teacher	It is the obligation of each student to be regularly informed about the course, the conduct of classes and the activities in class. All notices about teaching or possible postponement of classes will be published in a timely manner on the e-learning pages of the course and on the website of the Polytechnic. Students can contact teachers during the consultation period (at least one hour per week), while for short questions and explanations they can be contacted during class. It is also possible to ask questions by e-mail (from the official e-mail address on the domain @vus.hr) to which they will be answered in the shortest possible time (no later than five working days after receiving the e-mail).		

1. GENERAL INFORMATION ABOUT THE SUBJECT			
1.1. Title	**Development of Web Applications**	1.8. ISVU course code	
1.2. Lecturer	Milan Hrga M.Eng., lecturer	1.9. MOZVAG course code	
1.3. Assistants and/or associates		1.10. Forms of teaching (number of hours Lecturing +Practical exercises + Seminars + e learning)	(30+30+0+0)
1.4. Study programme (specialist, undergraduate, graduate)	**Undergraduate Professional Study of Business informatics**	1.11. Level of e- learning application (1st, 2nd, 3rd level), percentage of on line course performance (max. 20%)	3rd – course materials available online, taking colloquium and written exam on a computer, 0%
1.5. Course status (mandatory, elective)	Elective	1.12. Number of course revisions	2.
1.6. Study year	3rd	1.13. Modernization	■ yes □ no
1.7. Credit score (ECTS)	4	1.14. Percentage estimate of course changes and/or supplements	Less than 20% ■ More than 20 % □

2. COURSE DESCRIPTION	
2.1. Course objectives	Prepare students for independent web application development.
2.2. Terms of course entry and required competences	Completed a four-year high school education; possession of a qualification at level 4.2 according to the CROQF.

2.3. Learning outcomes on the study programme level	IU3: Evaluate database design according to business requirements. IU9: Select appropriate professional literature in Croatian and foreign language, prepare and independently hold presentations in Croatian and foreign language to professional and general audiences, and critically evaluate presented professional topics. IU12: Apply key aspects of information technology (programming, algorithms, data structures, databases and project management in the field of information technology). IU15: Compare and select appropriate development tools at the professional level.

2.4. Expected learning outcomes on the course level	**Learning outcomes** towards Bloom's taxonomy: (up to wo verbs per LO)	**LO Level:** *61. Recapture,* *62. Understanding,* *63. Application,* *64. Analysis,* *65. Evaluation,* 66. *Synthesis*
	1. Use Oracle Application Express development tool.	1,2,3,4,5,6
	2. Develop a database-based web application.	2,3,4,5,6
	3. Evaluate the possibilities of using the Oracle Application Express platform in Oracle cloud.	2,3,4,5,6
	4. Invoking Web Services and store data locally.	2,3,4,5,6
	5. Develop a complex graphical user interface using built-in tools and components, and customize it for all targeted mobile platforms and devices.	2,3,4,5,6
	6. Apply architecture patterns of a web application.	2,3,4,5,6

2.5. Course content according to detailed curriculum schedule

Constructive alignment

No:	Thematic ensemble / Lecture Topic	Course LO	Content / Teaching Method	Evaluation	Time needed
166.	Introduction to the course and detailed curriculum	-	Listen to lectures.	-	2 hours
	Introduction to Oracle Application Express web application architecture	1	Listen to lectures, working on computer and read literature.	Describe essential web standards in the context of historical development. Explain the basics of Oracle Application Express platform and web application architecture.	8 hours
167.	Basic elements of the graphical user interface	1,2,3,4,5,6	Listen to lectures, working on computer and read literature.	Explain the basic elements of the Oracle Application Express graphical user interface. Create a simple graphical user interface.	10 hours
168.	Data Access	1,2,3,4,5,6	Listen to lectures, working on computer and read literature.	Use SQL Workshop tool	10 hours
169.	Data Access	1,2,3,4,5,6	Listen to lectures, working on computer and read literature.	Provide access to data stored in the database.	10 hours
170.	Management of content and parts of the application	1,2,3,4,5,6	Listen to lectures, working on computer and read literature.	Use the Page Designer tool.	10 hours

	171.	Web application security	1,2,3,4,5,6	Listen to lectures, working on computer and read literature.	Configure access control for individual parts of the application.	10 hours
	172.	Creating report	1,2,3,4,5,6	Listen to lectures, working on computer and read literature.	Describe basic types of reports.	10 hours
	173.	Creating report	1,2,3,4,5,6	Listen to lectures, working on computer and read literature.	Create different reports and link them to a database.	10 hours
	174.	User forms	1,2,3,4,5,6	Listen to lectures, working on computer and read literature.	Describe the basic types of user forms for data entry and display.	10 hours
	175.	User forms	1,2,3,4,5,6	Listen to lectures, working on computer and read literature.	Create different user forms for data entry and display and link them to a database.	10 hours
	176.	Web application navigation	1,2,3,4,5,6	Listen to lectures, working on computer and read literature.	Program the components used for navigation through the application.	10 hours
	177.	Event management	1,2,3,4,5,6	Listen to lectures, working on computer and read literature.	Program events that occur as a result of user actions.	10 hours
	178.	Advanced graphical user interface elements	1,2,3,4,5,6	Listen to lectures, working on computer and read literature.	Embed advanced graphical interface elements (Oracle JET Charts, Calendars).	10 hours
	179.	Advanced graphical user interface elements	1,2,3,4,5,6	Listen to lectures, working on computer and read literature.	Embed advanced graphical interface elements (Trees).	10 hours
	180.	Distribution of completed web application	1,2,3,4,5,6	Listen to lectures, working on computer, read literature and prepare for the exam individually.	Enable web application in Oracle cloud.	10 hours

3. EVALUATION OF STUDENT WORK

3.1. Students` obligations

3.2. Monitoring student work (enter the share of ECTS credits for each activity so that the total number of ECTS points corresponds to the credit score of the course)

Attendance	1	Written exam	1 (without colloquia)	Project	
Experimental work		Research		Practical work	1
Essay		Report		Continuous examination	
Colloquium	2 (without written and oral exam)	Seminar paper		Other (inscribe)	
Class activities		Oral exam	1 (without colloquia)	Other (inscribe)	

3.3. Student workload

The student's workload on all bases amounts to 1 ECTS point for 30 hours of work per semester and is estimated as:

Commitment	***Hours (estimate)***

39. Attending classes	60
40. Practical work	30
41. Preparation for the Colloquium / exam through self-study	30

4. GRADING

4.1. Seminar paper grading

4.2. Colloquium / exam grading

Unsatisfactory	Satisfactory	Above average
Responds by memory, without a deeper understanding. Does not know or apply basic terms and concepts. Does not know how to apply or explain the contents of the course with examples.	Reproduces the basic concepts and without difficulty imparts new knowledge, understands the material, explains the terms and concepts supported with examples.	Knowledge is at the level of analysis, synthesis and evaluation. Observes the principles, accurately and thoroughly explains the content of the material, and logically connects and explains the terms and concepts supported with examples. Finds solutions that were not originally given. Notes correlations with related material.

4.3. Creating a final grade according to evaluation elements

Active participation in the lessons	70-75% of attendance	76-86% of attendance	87-100% of attendance	Created mental map. Solved case study.
	4 points	7 points	10 points	
Seminar paper	2	3	4	5
	5 points	7 points	8 points	10 points
Colloquium / written exam	2	3	4	5
	50-64,9%	65-79,9%	80-89,9%	90-100%
	25 points	30 points	35 points	40 points
Oral exam	2	3	5	5
	25 points	30 points	35 points	40 points

4.4. Creating a final grade according to absolute allocation

Percentage of adopted knowledge, skills and competences (teaching + final exam)	Numerous grade	ECTS grade
90 – 100%	5 (excellent)	A
80 – 89,9%	4 (very good)	B
65 – 79,9%	3 (good)	C
60 – 64,9%	2 (sufficient)	D
50 – 59,9%	2 (sufficient)	E

5. ADDITIONAL INFORMATION ABOUT THE COURSE			
5.1. Compulsory literature (available in the library and through other media)	**Title**	**Number of copies in the library**	**Availability via other media**
	1. Reviewed course materials available on the e-learning system		Available online
	2. Oracle Corporation, Oracle Application Express – Application Development Foundations		Available online
5.2. Additional literature (at the moment of changes and/or amended of study programme)	1. Patrick Cimolini, Oracle Application Express by Design, Apress, 2017	5	
5.3. Quality assurance methods that ensure the acquisition of knowledge, skills and competences	The control of students' work quality and the acquisition of necessary knowledge and skills will be ensured through interactive work. By keeping track of attendance and student activity during classes and provided information on students` progress through short colloquiums and homework, information for further guidance to students will be provided in order to increase the efficiency of their work. Students will be informed about their rights and obligations as well as the methods of work and the required literature. Indicators of quality assurance system: Student survey, monitoring of annual data from the Croatian employment service on the annual state of student employment, surveys from employers and Alumni association.		
5.4. information on the course and contact with the teacher	It is the responsibility of each student to be regularly informed about the course, the coursework, and the classroom activities. All notices of classes or possible adjournment will be published in a timely manner on the e-learning site of the course and on the website of the Polytechnic. Students can contact teachers during the consultation period (at least one hour per week), while for short questions and explanations they can be contacted during class. It is also possible to ask questions by e-mail (from the official e-mail address at @ vus.hr), which will be answered as soon as possible (no later than five working days after receiving the e-mail).		

1. GENERAL INFORMATION ON THE CASE			
1.1. Case name	**Cloud computing**	1.8. Course code in ISVU	
1.2. Case holders	PhD. Frane Urem, college prof.	1.9. Course code in MOZVAG	
1.3. Associates	mr.sc. Darko Jureković., sen.lecturer	1.10. Teaching method (number of hours P+V+S+e-learning)	(30+30+0+0)
1.4. Study programme (professional, specialist graduate professional study programme)	**Undergraduate professional study of Business Informatics**	1.11. Level of application of e-learning (level 1,2,3), Percentage of courses online (max. 20%)	Level 3 - materials available Online, taking colloquiums and written exams on a computer 0%
1.5. Course status (mandatory,elective)	Elective	1.12. Sequence number of amendments to the college description	2.
1.6. Year of study	Year 3 of Study	1.13 Modernization	■ not to□
1.7. Points Value (ECTS)	4	1.14. Estimate of the percentage of amendments and/or amendments course program	Less than 20% ■ More than 20% of □

2. COURSE DESCRIPTION	
2.1. Course objectives	Prepare students for independent use of services available in the computer cloud.
2.2. Terms of course entry and required competences	Completed four-year secondary education; possession of a qualification at level 4.2 according to the Croatian Chamber of Economy.
2.3. Learning outcomes on the study programme level	IU9 to apply relevant professional literature in Croatian and foreign language, prepare and independently present presentations in Croatian and foreign language for professional and general public, and critically evaluate presented professional topics IU12. to apply key aspects of information technology (programming, algorithms, data structures, databases, and project management in the field of information technology) IU15. to compare and select appropriate development tools at professional level

2.4. Expected learning outcomes on the course level	**Learning outcomes** according to Bloom's taxonomy: *(up to two verbs per IU)*	**LO Level:** *1. Recapture,* *2. Understanding,* *3. Application,* *4. Analysis,* *5. Evaluation,* *6. Synthesis*
	1. Identify computer cloud features	1,2,3,4,5,6
	2. Explain the main services in the computer cloud	2,3,4,5,6
	3. Configure and use a database in a computer cloud	2,3,4,5,6
	4. Analyze large amounts of data in the computer cloud	2,3,4,5,6
	5. Evaluate the performance of individual computer cloud services	2,3,4,5,6
	6. Rate the characteristics of the selected computer cloud	2,3,4,5,6

2.5. Course content according to detailed curriculum schedule

Constructive alignment

No.	Thematic unit	IU courses	Teaching content/method	Evaluation	Time taken
	Introduction to the course and detailed performance plan of teaching.	-	They're listening to the lecture.	-	2 hours
	Introduction to computer cloud architecture - Introduction to Oracle Cloud infrastructure.	1	They listen to lectures, they work on a computer, they read literature.	Describe essential web standards in the context of historical development Interpret the basics of computer cloud architecture and Oracle Cloud infrastructure	8 hours
2.	Oracle Cloud Console Basic Elements	1,2,3,4	They listen to a lecture, they work on a computer, they read literature	Explain the basic parts of the interface for accessing and configuring Oracle Cloud services.	10 a.m.
3.	Infrastructure as a service, virtual infrastructure.	1,2,3	They listen to a lecture, they work on a computer, they read literature	Configure and install a Linux server in the Oracle cloud. Install web services on a virtual Linux server.	10 a.m.
4.	Network infrastructure management, resource load management.	1,2,3,4	They listen to a lecture, they work on a computer, they read literature	Use and configure Virtual Cloud Networks and Load Balancer services.	10 a.m.
5.	Security and storage of cloud data.	1,2,3,4,5,6	They listen to a lecture, they work on a computer, they read literature	Use and configure Object Storage services.	10 a.m.
6.	Cloud databases.	1,2,3,4,5,6	They listen to a lecture, they work on a computer, they read literature	Use and configure an autonomous database in the Oracle cloud. Use and configure autonomous databases by using SQL Developer tools.	10 a.m.

	7.	Cloud Development Tools	3,4,5,6	They listen to a lecture, they work on a computer, they read literature	Create a simple web application that uses an Oracle autonomous database. Use the Oracle APEX development tool.	10 a.m.
	8.	Cloud Development Tools	3,4,5,6	They listen to a lecture, they work on a computer, they read literature	Create a simple web application that uses an Oracle autonomous database. Use the Oracle APEX development tool.	10 a.m.
	9.	Machine learning services	1,2,3,4,5,6,	They listen to a lecture, they work on a computer, they read literature	Use and configure the Autonomous Data Warehouse service. Use and configure machine learning notebook service.	10 a.m.
	10.	Services for analyzing a larger amount of data.	1,2,3,4,5,6	They listen to a lecture, they work on a computer, they read literature	Use and configure the Data Analytics service.	10 a.m.
	11.	Services for analyzing a larger amount of data.	1,2,3,4,5,6	They listen to lectures, they work on a computer, they read literature.	Use and configure the Data Analytics service.	10 a.m.
	12.	AI services.	1,2,3,4,5,6	They listen to a lecture, they work on a computer, they read literature	Use and configure the Digital Assant service.	10 a.m.
	13.	AI services.	1,2,3,4,5,6	They listen to a lecture, they work on a computer, they read literature	Use and configure the Digital Assant service.	10 a.m.
	14.	Messaging services.	1,2,3,4,5,6	They listen to a lecture, they work on a computer, they read literature	Use and configure the Oracle User Messaging service.	10 a.m.
	15.	Data security in the computer cloud	1,2,3,4,5,6	They listen to a lecture, work on a computer, read literature, individually prepare for the exam	Configure security settings for data stored about the Oracle cloud.	10 a.m.

3. EVALUATION OF THE STUDENT WORK

3.1. Students` obligations

In accordance with ***the Ordinance on Study*** and ***the Ordinance on evaluation and evaluation of student work***: for all full-time students, attendance at a minimum of 70% in class. Part-time students have an obligation to attend lecture classes at least 50%. All students must create, present and positively colloquiate the seminar paper.
Students who have achieved during class:

- From 0-24.9% of ECTS credits- they are rated F (unsuccessful) and cannot earn ECTS credits, and must re-enter the subject in the next academic year;
- From 25 - 49.9% - they are rated FX (insufficient) and must come out and pass a written exam (test). A written exam (test) may be held within a regular or extraordinary examination period;
- More than 50% - students have the right to access the final exam of the subject.

Students can pass the final exam in the course in two ways: a) during class through continuous monitoring of students (active participation in classes and exercises and two colloquiums); b) during classes (active participation in classes and exercises) and by taking exams (written and oral part of the exam).

3.2. Monitoring student work (enter the share of ECTS credits for each activity so that the total number of ECTS points corresponds to the credit score of the course)

Attendance	1	Written exam	1 (no colloquiums)	Project	
Experimental work		Research		Practical work	1
Assay		Report		Continuous verification	
Colloquiums	2 (no written and oral exam)	Seminar paper		(other type)	
Teaching activities		Viva voce	1 (no colloquiums)	(other type)	

3.3. Student workload	The student's workload on all grounds is for 1 ECTS point 30 hours of work per semester and is estimated as:

	Obligation	***Hours (estimate)***
1.	Attendance	60
2.	Practical work on exercises	30
3.	Preparation for colloquium/exam through independent learning	30

4. FORMATION OF THE RATING

4.1. Seminar paper grading	

4.2. Colloquium / exam grading	**Poor**	**Satisfying**	**Above average**
	The student fits from memory, without a deeper understanding. The student does not know or apply basic terms and concepts. The student does not know how to apply or explain by example the content of the course.	The student reproduces basic concepts and seamlessly transfers new knowledge, understands the material, explains the terms and concepts he/she substantiates with examples.	Knowledge is at the level of analysis, synthesis and evaluation. The student perceives legalities, accurately and thoroughly explains the content of the material and logically connects and explains the terms and concepts it substantiates with examples. The student finds solutions that were not originally given. The student notices correlations with related material.

4.3. Creating a final grade according to evaluation elements					
	Active attendance	70-75% attendance	76-86% attendance	87-100% attendance	
		4 points	7 points	10 points	
	Exercises	2	3	4	5
		5 points	7 points	8 points	10 points
	Colloquium / Written exam	2	3	4	5
		50-64,9%	65-79,9%	80-89,9%	90-100%
		25 points	30 points	35 points	40 points
	Oral exam	2	3	5	5
		25 points	30 points	35 points	40 points

4.4. Creating a final grade according to absolute allocation	Percentage of knowledge, skills and competences adopted (teaching + final exam)	Numerical rating	ECTS rating
	90 – 100%	5 (excellent)	And
	80 – 89,9%	4 (very good)	B
	65 – 79,9%	3 (good)	C

		60 – 64,9%	2 (enough)	D	
		50 – 59,9%	2 (enough)	E	

5. ADDITIONAL INFORMATION ON THE CASE

5.1. Compulsory literature (available in the library and through other media)	Title	Number of copies in the library	Availability through other media
	1. Peer-reviewed teaching materials in the subject, available on the e-learning system		Available online
	2. Oracle Academy Member Hub portal teaching materials		Available online
5.2. Additional literature (at the moment of changes and/or amended of study programme)	1. R. Ramklass , Oracle Cloud Infrastructure Architect Associate All-In-One Exam Guide (Exam 1Z0-1072), McGraw Hill, 2020	5	
5.3. Quality assurance methods that ensure the acquisition of knowledge, skills and competences	Control of the quality of work of students and the acquisition of the necessary knowledge and skills will be ensured through interactive work. Keeping records of student attendance and activities in teaching and obtaining information about student progress through colloquiums will provide the information necessary for further instructions to students in order to increase the efficiency of their work. Students will be informed about their rights and obligations and working methods and the necessary literature. Quality assurance system indicators: Student survey, monitoring of annual data from the HZZZ on the annual employment status of students, surveys of employers and alumni associations.		
5.4. Information on the course and contacting the teacher	It is the obligation of each student to be regularly informed about the course, the conduct of classes and the activities in class. All notices about teaching or possible postponement of classes will be published in a timely manner on the e-learning pages of the course and on the website of the Polytechnic. Students can contact teachers during the consultation period (at least one hour per week), while for short questions and explanations they can be contacted during class. It is also possible to ask questions by e-mail (from the official e-mail address on the domain @vus.hr) to which they will be answered in the shortest possible time (no later than five working days after receiving the e-mail).		

1. GENERAL INFORMATION			
1.1. Course lecturer	Zvonimir Klarin,	1.7. Credit score (ECTS)	12
1.2. Course title	**PROFESSIONAL PRACTICE**	1.8. Forms of teaching (number of hours Lecturing +Practical exercises + Seminars + elearning)	360
1.3. Assistants and/or associates	Milan Hrga	1.9. Level of e- learning application (1st, 2nd, 3rd level), percentage of on line course performance (max. 20%)	1stlevel
1.4. Study programme (specialist, undergraduate, graduate)	**Professional Undergraduate Study of Business Informatics**	1.10. Number of course revisions	second
1.5. Course status (mandatory, elective)	Mandatory	1.11.Modernization	yes
1.6. Year of study	3rd	1.12. Percentage estimate of course changes and/or supplements	**Less than 20%** □ More than 20 % □

2. COURSE DESCRIPTION	
2.1. Course objectives	The basic goal of student practice is gaining professional experience in the field of Informatic Management . Student practice will further enable students to: • adaptation to thework in genvironment; • linking theoretic alknowledge and practicale xperience; • Orientation to future employment; - Strengthe ningthe links between the Polytechnic in Sibenik and companies where students conduct professional practice - feedback about knowledge and skills that the present labormarket expects, with the aim of improving the teaching process
2.2. Terms of course entry and required competences	All courses must be attended before the beginning of professional training
2.3. Learning outcomes on the study programme level	- forming a sense of responsibility and motivation for the execution of assigned jobs. - creating the necessary social feelings for teamwork - verification of learned knowledge and acquired skills in specific situations - acquiring the practice of reporting, consulting and managing business - describing the system of interdependencies between the jobs and responsibilities of employees in the company or the IT department - describing the methods of job scheduling, - describing the methods of task assignment, and application of task-solving technology

<table>
<tr><td></td><td colspan="6">- describing the content and equipment of workshops / services / systems
- listing tasks that include:
preventive maintenance of information systems (daily, monthly and yearly)
- describing the procedures of work and communication between the company and the client (or department within the company) in order to increase the efficiency of the business, eliminate the failures and minimize them in the future
- describing the process of coordination of classification and disposal of equipment, technological / technical and other waste in accordance with legal regulations
- describing the procedure for reporting all the business / client queries and failures
- verifying acquired knowledge in the field of programming languages and data modeling andprocess in specific circumstances
- interpreting the methodologies and basic principles for the development and construction of the site
- application of database systems with the ability to form, edit and maintain relational and object-oriented databases
- interpret data flow control mechanisms, error control, data transfer methods using network routing methods, apply LAN technology
- describing and applying the most common techniques of information systems protection with knowledge of legal framework for information and computer security</td></tr>
<tr><td>2.4. Expected learning outcomes on the course level</td><td colspan="6">Following completion of this practice, students will adopt and apply basic professional knowledge about ways and processes of department and sector in the enterprise, which implies different processes of planning (finance, enterprise development, new product development), organization (definition of organizational structures), leadership (projects, people), control (financial resources, human resources).</td></tr>
<tr><td>2.5. Course content according to detailed curriculum schedule</td><td colspan="6">/</td></tr>
<tr><td rowspan="2">2.6. Teaching methods</td><td colspan="2">□ lectures
□ seminars and workshops
□ practical exercises
□ distance education
□ mixed e-learning
□ field teaching</td><td colspan="2">□ independent tasks
□ multimedia and network
□ laboratory
□ mentoring
□ other</td><td colspan="2">2.7. Comments:</td></tr>
<tr><td colspan="4"></td><td colspan="2"></td></tr>
<tr><td>2.8. Students` obligations</td><td colspan="6">In accordance with the signed Agreement of professional cooperation between the Polytechnic of Šibenik and the company, the student is obliged to undertake a professional practice in an appropriate time period (this practice is compulsory for all regular and extraordinary students). Students who are employed in informatic-related companies and / or work at an operational or tactical level of management are exempted from doing this practice, and they must provide a copy of the employment contract as proof of employment. The student is obliged to conduct the Diary of work in which he write the names of the professional processes (exercises or tasks) he has performed every day.</td></tr>
<tr><td rowspan="6">2.9. Monitoring student work (enter the share of ECTS credits for each activity so that the total number of ECTS points corresponds to the credit score of the course)</td><td>Attendance</td><td></td><td>Written exam</td><td></td><td>Project</td><td></td></tr>
<tr><td>Experimental work</td><td></td><td>Research</td><td></td><td>Practical work</td><td>8</td></tr>
<tr><td>Essay</td><td></td><td>Report</td><td>1</td><td>Continuous examination</td><td></td></tr>
<tr><td>Colloquium</td><td></td><td>Seminar paper</td><td></td><td>Other</td><td></td></tr>
<tr><td>Class activity</td><td></td><td>Oral exam</td><td></td><td>Other</td><td></td></tr>
<tr><td>2.10. Grading and evaluating students` work during classes and on the exam</td><td colspan="6">When conducting a professional practice, a student is obliged to lead and write a Diary work on completed tasks / exercises. Student anticipates in advance the time of the Diary work, at the course lecturer. The lecturer of the course evaluates the work journal and then writes the student to the student index, satisfied or not satisfied. In the case of not satisfied, the student is obligated to correct the Diary of work, and come back for review.</td></tr>
</table>

2.11. Compulsory literature (available in the library and via other media)	**Title**	**Number of copies in the library**	**Availability via other media**
2.12. Additional literature (at the moment of changes and/or amended of study programme)			
2.13. Quality assurance methods that ensure the acquisition of knowledge, skills and competences	The control of students' work quality and the acquisition of necessary knowledge and skills will be ensured through interactive work. By keeping track of attendance and student activity during classes and provided information on students` progress through short colloquiums and homework, information for further guidance to students will be provided in order to increase the efficiency of their work. Students will be informed about their rights and obligations as well as the methods of work and the required literature. Indicators of quality assurance system: Student survey, monitoring of annual data from the Croatian employment service on the annual state of student employment, surveys from employers and Alumni association.		

LEARNING OUTCAMS MATRIX OF UNDERGRADUATE PROFESSIONAL STUDY
BUSINESS INFORMATICS IN ACADEMIC YEAR 2025./2026.

LEARNING OUTCOMES	M/E	I1	I2	I3	I4	I5	I6	I7	I8	I9	I10	I11	I12	I13	I14	I15	I16	I17	Learn.outc. per course
Principles of economics	M						+			+					+				3
Financial mathematics	M	+	+				+	+											4
Computer application in office automation	M	+	+											+	+				4
Programming fundamentals	M									+			+			+			3
Introduction to computer science	M	+	+			+				+		+	+			+			7
English for information technology I	M						+			+					+				3
Business communication	M									+					+			+	3
Principles of microeconomics	M						+			+							+		3
Computer architecture	M	+	+							+				+				+	5
Introduction to web technologies	M				+	+				+			+			+			5
Information technologies and environmental protection	M	+								+	+								3
Mathematics	M						+	+									+		3
E-business	M	+	+							+				+				+	5
English for information technology II	M						+			+					+				3
Principles of accounting	M						+	+		+					+				4
Management	M						+		+	+					+		+	+	6
Object oriented programming	M							+		+			+			+			4
Introduction to operating systems	M	+										+	+	+					4
Introduction to databases	M	+		+						+			+			+			5
Commercial and copyright low	M	+								+	+						+	+	5
Principles of marketing	M	+			+					+					+	+		+	6

Business statistics	M						+	+									+		3
Introduction to computer networks	M	+				+					+	+		+					5
Business information systems	M			+	+				+	+			+			+			6
Operating systems	M	+										+	+	+					4
Databases	M	+		+						+		+	+					+	6
Entrepreneurship	M						+		+								+		3
Information systems analysis and design	M			+						+		+	+			+		+	6
Management of information services	M	+		+					+	+							+	+	6
Protection and security of information Systems	M	+				+				+	+			+	+				6
Computer networks	M	+				+						+		+					4
Development of mobile applications	E			+						+			+			+			4
Digital marketing and marketing analytics	E				+					+						+			3
Operation research	E		+					+		+					+	+	+		6
Quality management	E									+							+	+	3
Principles of corporate finance	E		+				+		+	+					+		+		6
Project management	M									+			+			+		+	4
Development of web applications	E			+						+			+			+			4
Cloud computing	E									+			+			+			3
Professional praxis	M	+	+						+	+	+	+			+	+	+	+	10
Mandatory courses contributing to learning outcome		17	6	5	3	5	10	5	5	24	5	8	11	8	10	10	8	11	
Total courses that contribute to learning outcome		**17**	**8**	**7**	**4**	**5**	**11**	**6**	**6**	**31**	**5**	**8**	**14**	**8**	**12**	**15**	**11**	**12**	

Curriculum for Professional Undergraduate Study of Business Informatics Šibenik University of Applied Sciences, for the academic year 2026./2027. was adopted at the 41th session of the Council Šibenik University of Applied Sciences, which was held on Wednesday, July 13. 2026.

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REGISTERY NUMBER: 103-05-26-01

Šibenik,14.07.2026.

Head of Department Business Informatics
PhD Ivan Livaja, colleague professor

Dean of Šibenik University of Applied Sciences
PhD Ljubo Runjić, college professor