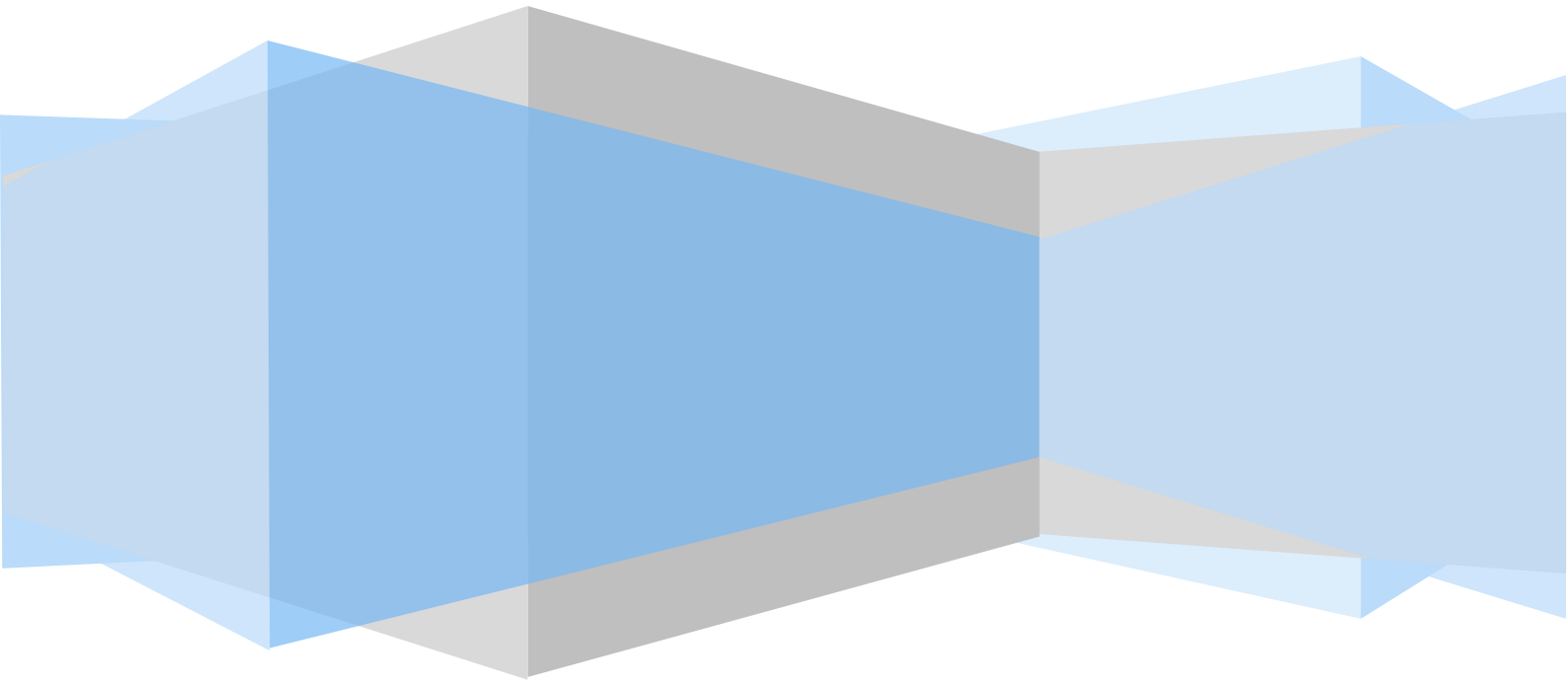
Bjelovar University of Applied Sciences

COURSE CATALOGUE

COMPUTER SCIENCE - academic year 2024/25



Catalogue of courses offered in English

NAME OF THE COURSE	SEMESTER (WS / SS / WS & SS)	ECTS	PAGE WITH DETAILED DESCRIPTION OF THE COURSE
Introduction to Informatics	WS	4.0	3
Introduction to Programming	WS	6.0	4
Communication Skills	WS	3.0	5
Technical English Language 1	WS	2.0	6
Application of Mathematical Software Tools	SS	2.0	7
Introduction to Computer Networks	SS	6.0	8
Introduction to Linux	SS	6.0	9
Programming in C	SS	7.0	10
Technical English Language 2	SS	2.0	11
Digital Techniques (only lectures without practical sessions)	WS	6.0	12
Web Programming 1	WS	5.0	13
Object-Oriented Programming	WS	6.0	14
Data Structures and Algorithms	WS	5.0	15
Database Systems	WS	6.0	16
Technical English Language 3	WS	2.0	17
Microcomputers	SS	4.0	18
C# Programming	SS	5.0	19
Fundamentals of Programming in JAVA	SS	5.0	20
Web Programming 2	SS	6.0	21
Operating Systems	SS	4.0	22
Technical English Language 4	SS	2.0	23
.NET Programming	WS	6.0	24
Mobile Application Development	WS	6.0	25
Internet of Things	WS	5.0	26
Application of Blockchain Technology	WS	4.0	27
Field Practice 1	WS	3.0	28
Computer and Data Security	SS	6.0	29
Field Practice 2	SS	5.0	30
Computer and Robot Vision	SS	4.0	31
Introduction to Artificial Intelligence	SS	4.0	32

1st semester (WS)

General information				
Course instructor	**Dario Vidić** **Mateo Ivančić**			
Course title	**Introduction to Informatics**			
Programme of study	Undergraduate professional programme of study in Mechatronics Undergraduate professional programme of study in Computer Science			
Course status	Compulsory			
Year	1st, WS			
ECTS	4			
Type of classes (number of contact hours)	Lectures	Practical sessions*		Seminars
	15	APS	LPS	0
		0	30	

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION
1.1. Expected learning outcomes
Upon completion of the course students will be able to: O1: analyse the historical development and current significance of computer systems, O2: describe and recognise the main components of a computer system, their functions and the role of numeral systems in computer operation, O3: describe the role of computer operating systems, O4: create a simple database, O5: edit and format texts, O6: process data in table calculations, O7: describe adjustment and maintenance techniques related to the Windows operating system and its security settings.
1.2. Students' obligations
Laboratory sessions
1.3. Students' performance monitoring

Class attendance		Class participation		Seminar paper		Experimental work	
Written exam	3.2	Oral exam		Essay		Research	
Project		Continuous assessment	0.2	Class report		Practical work	0.6
Portfolio							

General information				
Course instructor	**Ivan Sekovanić**			
Course title	**Introduction to Programming**			
Programme of study	Undergraduate professional programme of study in Computer Science			
Course status	Compulsory			
Year	1st, WS			
ECTS	6			
Type of classes (number of contact hours)	Lectures	Practical sessions*		Seminars
	30	APS	LPS	0
		0	30	

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION

1.1. Expected learning outcomes

Upon completion of the course students will be able to:

- O1: distinguish between simple types of data and subject them to programming operations,
- O2: apply consecutive, selection commands and loops within a programming code,
- O3: use complex types of data and implement more complex programming operations,
- O4: write programming functions with or without return value that performs various operations,
- O5: use programming commands for writing and reading data from a textual file.
- O6: describe advanced features and abilities in programming

1.2. Students' obligations

Laboratory sessions

1.3. Students' performance monitoring

Class attendance		Class participation	0.36	Seminar paper		Experimental work	
Written exam	4.14	Oral exam		Essay		Research	
Project		Continuous assessment		Class report		Practical work	1.5
Portfolio							

General information				
Course instructor	Tatjana Badrov			
Course title	Communication Skills			
Programme of study	Undergraduate professional programme of study in Mechatronics Undergraduate professional programme of study in Computer Science			
Course status	Compulsory			
Year	1st, WS			
ECTS	3			
Type of classes (number of contact hours)	Lectures	Practical sessions*		Seminars
	15	APS	LPS	0
		30	0	

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION

1.1. Expected learning outcomes

Upon completion of the course students will be able to:

- O1: explain basic concepts, types and difficulties in the field of communication,
- O2: distinguish between the techniques of active listening,
- O3: apply information collection techniques and a balanced feedback,
- O4: identify and compare basic communication styles and apply an assertive I-message,
- O5: distinguish between three types of complaints and complaint resolving techniques,
- O6: prepare and deliver a presentation on a given topic,
- O7: describe and demonstrate the basic elements of the negotiation process,
- O8: explain debate principles and participate in a debate on a given topic.

1.2. Students' obligations

2 preliminary exams
3 homework assignments, one of which being the preparation for a presentation
10 written assignments/exercises

1.3. Students' performance monitoring

Class attendance	0.5	Class participation	0.5	Seminar paper		Experimental work	
Written exam	1	Oral exam	0.5	Essay		Research	
Project		Continuous assessment	0.5	Class report		Practical work	
Portfolio							

General information				
Course instructor	Ivana Jurković			
Course title	Technical English 1			
Programme of study	Undergraduate professional programme of study in Computer Science			
Course status	Compulsory			
Year	1st, WS			
ECTS	2			
Type of classes (number of contact hours)	Lectures	Practical sessions*		Seminars
	15	APS	LPS	0
		30	0	

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION							
1.1. Expected learning outcomes							
Upon completion of the course students will be able to use the English language to: O1: describe technical functions and applications of products and the manner in which products function, O2: describe the properties and application of materials used in various fields of engineering, O3: describe the shape and features of components and assemblies as well as joining and fixing procedures, O4: demonstrate mastery of simple grammatical structures.							
1.2. Students' obligations							
2 preliminary exams or the written exam Oral exam							
1.3. Students' performance monitoring							
Class attendance		Class participation	0.5	Seminar paper		Experimental work	
Written exam	1	Oral exam	0.5	Essay		Research	
Project		Continuous assessment		Class report		Practical work	
Portfolio							

2nd semester (SS)

General information			
Course instructor	Danijel Radočaj		
Course title	Application of Mathematical Software Tools		
Programme of study	Undergraduate professional programme of study in Mechatronics Undergraduate professional programme of study in Computer Science		
Course status	Compulsory		
Year	1st, SS		
ECTS	2		
Type of classes (number of contact hours)	Lectures	Practical sessions*	Seminars
	0	APS: 0 / LPS: 30	0

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION

1.1. Expected learning outcomes

Upon completion of this course students will be able to:
O1: initialise various types of variables in Matlab and execute basic relation and logical operations on them,
O2: use programming loops and flow control in Matlab,
O3: use basic mathematical functions, functions for processing sign sequences and functions for working with polynomials in Matlab,
O4: draw a graph of a given mathematical function using graphical functions in Matlab,
O5: use basic functions of the symbol package,
O6: use Simulink to simulate system response.

1.2. Students' obligations

Continuous assessment.

1.3. Students' performance monitoring

Class attendance	1	Class participation		Seminar paper		Experimental work	
Written exam		Oral exam		Essay		Research	
Project		Continuous assessment	1	Class report		Practical work	
Portfolio							

General information				
Course instructor	Ivan Sekovanić			
Course title	Introduction to Computer Networks			
Programme of study	Undergraduate professional programme of study in Computer Science			
Course status	Compulsory			
Year	1st, SS			
ECTS	6			
Type of classes (number of contact hours)	Lectures	Practical sessions*		Seminars
	30	APS	LPS	0
		0	30	

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION
1.1. Expected learning outcomes
Upon completion of this course students will be able to: O1: describe basic concepts and terms related to computer networks, O2: distinguish between the purposes of various network devices and explain the procedure of connecting several computers into a network, O3: describe the operation of a standard TCP/IP protocol, O4: name and describe the operation of the most important protocols of the application layer.
1.2. Students' obligations
Laboratory sessions
1.3. Students' performance monitoring

Class attendance		Class participation	0.36	Seminar paper		Experimental work	
Written exam	4.68	Oral exam		Essay		Research	
Project		Continuous assessment		Class report		Practical work	0.96
Portfolio							

General information				
Course instructor	Ivan Sekovanić			
Course title	Introduction to Linux			
Programme of study	Undergraduate professional programme of study in Computer Science			
Course status	Compulsory			
Year	1st, SS			
ECTS	6			
Type of classes (number of contact hours)	Lectures	Practical sessions*		Seminars
	30	APS	LPS	0
		0	30	

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION
1.1. Expected learning outcomes
Upon completion of this course students will be able to: O1: install Linux on a virtual machine, explain the role and significance of the Linux operating system in the current IT system, O2: explain the structure and role of a directory and work with directories in shell prompt, O3: work with file sin Linux, O4: use and explain authorisation and groups in Linux, O5: explain the work with processes in Linux, O6: describe installation and configuration of basic Linux servers, O7: code basic shell scripts.
1.2. Students' obligations
Laboratory sessions
1.3. Students' performance monitoring

Class attendance		Class participation		Seminar paper		Experimental work	
Written exam	4.8	Oral exam		Essay		Research	
Project		Continuous assessment	1.2	Class report		Practical work	
Portfolio							

General information				
Course instructor	**Krunoslav Husak**			
Course title	**Programming in C**			
Programme of study	Undergraduate professional programme of study in Computer Science			
Course status	Compulsory			
Year	1st, SS			
ECTS	7			
Type of classes (number of contact hours)	Lectures	Practical sessions*		Seminars
	30	APS	LPS	0
		0	45	

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION

1.1. Expected learning outcomes

Upon completion of this course students will be able to:

O1: use basic and logical types of data,
O2: apply the structures for the program flow control,
O3: apply fields in programming solutions,
O4: explain the execution and apply strings,
O5: develop own functions and correctly declare arguments depending on the type of transfer,
O6: interpret the role of a pointer in programs and use them for working with fields and functions,
O7: interpret the structures and ways of recording data in files,
O8: code according to a given specification in the programming language C.

1.2. Students' obligations

Laboratory sessions

1.3. Students' performance monitoring

Class attendance		Class participation		Seminar paper		Experimental work	
Written exam	4.8	Oral exam		Essay		Research	
Project		Continuous assessment		Class report		Practical work	1.2
Portfolio							

General information				
Course instructor	Ivana Jurković			
Course title	Technical English 2			
Programme of study	Undergraduate professional programme of study in Computer Science			
Course status	Compulsory			
Year	1st, SS			
ECTS	2			
Type of classes (number of contact hours)	Lectures	Practical sessions*		Seminars
	15	APS	LPS	0
		30	0	

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION							
1.1. Expected learning outcomes							
Upon completion of the course students will be able to use the English language to: O1: describe the procedure of developing an engineering project, O2: describe technical problems and malfunctions as well as their causes and possible solutions, O3: discuss about technical requirements and describe project feasibility, improvements and redesigns, O4: demonstrate mastery of simple grammatical structures.							
1.2. Students' obligations							
2 preliminary exams or the written exam Oral exam							
1.3. Students' performance monitoring							
Class attendance		Class participation	0.5	Seminar paper		Experimental work	
Written exam	1	Oral exam	0.5	Essay		Research	
Project		Continuous assessment		Class report		Practical work	
Portfolio							

3rd semester (WS)

General information				
Course instructor	**Dario Vidić**			
Course title	**Digital Techniques**			
Programme of study	Undergraduate professional programme of study in Mechatronics Undergraduate professional programme of study in Computer Science			
Course status	Compulsory			
Year	2nd, WS			
ECTS	6			
Type of classes (number of contact hours)	Lectures	Practical sessions*		Seminars
	30	APS	LPS	0
		16	14	

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION
1.1. Expected learning outcomes
Upon completion of this course students will be able to: O1: use different number systems and codes, O2: design units for detecting and correcting data transfer errors, O3: minimise and realise complex logical functions using basic logic circuits, O4: explain the operation of combinational and arithmetic units, O5: explain the operation of basic types of bistables and counters, O6: design sequential circuits, O7: explain the operation of AD and DA conversion circuits.
1.2. Students' obligations
Laboratory sessions
1.3. Students' performance monitoring

Class attendance		Class participation		Seminar paper		Experimental work	
Written exam	3.6	Oral exam		Essay		Research	
Project		Continuous assessment	0.6	Class report		Practical work	1.8
Portfolio							

General information			
Course instructor	**Tomislav Adamović**		
Course title	**Web Programming 1**		
Programme of study	Undergraduate professional programme of study in Computer Science		
Course status	Compulsory		
Year	2nd, WS		
ECTS	5		
Type of classes (number of contact hours)	Lectures	Practical sessions*	Seminars
	30	APS: 0 / LPS: 30	0

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION							
1.1. Expected learning outcomes							
Upon completion of this course students will be able to: O1: Create a static HTML document, use HTML5 for animation effects O2: Use CSS. Create a separate CSS file. Use CSS framework O3: Manage HTML page elements using JavaScript O4: Apply standard JavaScript libraries to manage HTML page elements							
1.2. Students' obligations							
Laboratory sessions Project							
1.3. Students' performance monitoring							
Class attendance		Class participation		Seminar paper		Experimental work	
Written exam	1	Oral exam		Essay		Research	
Project	4	Continuous assessment		Class report		Practical work	
Portfolio							

General information				
Course instructor	Krunoslav Husak			
Course title	Object-Oriented Programming			
Programme of study	Undergraduate professional programme of study in Computer Science			
Course status	Compulsory			
Year	2nd, WS			
ECTS	6			
Type of classes (number of contact hours)	Lectures	Practical sessions*		Seminars
	30	APS	LPS	0
		0	30	

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION							
1.1. Expected learning outcomes							
Upon completion of this course students will be able to: O1: Use fundamental language elements in creating a program in the programming language C++ O2: Correctly define classes and objects O3: Correctly define inheritance and polymorphism O4: Correctly define templates O5: Use a C++ standard library for program development O6: Use the object-oriented programming language C++ and its libraries for developing a program according to a given specification							
1.2. Students' obligations							
Laboratory sessions Project							
1.3. Students' performance monitoring							
Class attendance		Class participation		Seminar paper		Experimental work	
Written exam	1.2	Oral exam		Essay		Research	
Project	3.6	Continuous assessment		Class report		Practical work	1.2
Portfolio							

General information				
Course instructor	Ante Javor			
Course title	Data Structures and Algorithms			
Programme of study	Undergraduate professional programme of study in Computer Science			
Course status	Compulsory			
Year	2nd, WS			
ECTS	5			
Type of classes (number of contact hours)	Lectures	Practical sessions*		Seminars
	30	APS	LPS	0
		0	30	

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION

1.1. Expected learning outcomes

Upon completion of this course students will be able to:
O1: explain the complexity of operations and algorithms,
O2: use recursive algorithms,
O3: create solutions based on simple data structures (list, stack, queue),
O4: create solutions based on complex data structures (tree, heap, queue, dictionary),
O5: describe and use sorting, search and compression algorithms,
O6: use general techniques for algorithm construction,
O7: program in the programming language C++ according to the given specification.

1.2. Students' obligations

Laboratory sessions

1.3. Students' performance monitoring

Class attendance		Class participation		Seminar paper		Experimental work	
Written exam	4	Oral exam	1	Essay		Research	
Project		Continuous assessment		Class report		Practical work	1
Portfolio							

General information			
Course instructor	**Tomislav Adamović**		
Course title	**Database Systems**		
Programme of study	Undergraduate professional programme of study in Computer Science		
Course status	Compulsory		
Year	2nd, WS		
ECTS	6		
Type of classes (number of contact hours)	Lectures	Practical sessions*	Seminars
	30	APS: 0 / LPS: 30	0

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION

1.1. Expected learning outcomes

Upon completion of this course students will be able to:

- O1: create and change tables in the relational data model
- O2: select data from tables
- O3: write CRUD commands for changing data in tables
- O4: explain basic types of parameters and objects in PL/SQL
- O5: create and test the RESTfull service on a database
- O6: work with fundamental commands and programming concepts in PL/SQL
- O7: work with exceptions, debug a code and perform unit tests

1.2. Students' obligations

Laboratory sessions
Project

1.3. Students' performance monitoring

Class attendance		Class participation		Seminar paper		Experimental work	
Written exam	1.8	Oral exam		Essay		Research	
Project	4.2	Continuous assessment		Class report		Practical work	
Portfolio							

General information				
Course instructor	Ivana Jurković			
Course title	Technical English 3			
Programme of study	Undergraduate professional programme of study in Computer Science			
Course status	Compulsory			
Year	2st, WS			
ECTS	2			
Type of classes (number of contact hours)	Lectures	Practical sessions*		Seminars
	15	APS	LPS	0
		30	0	

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION							
1.1. Expected learning outcomes							
Upon completion of the course students will be able to use the English language to: O1: describe regulations, standards procedures and measures related to occupational health and safety O2: describe automated systems, measurable parameters, readings and approximate values O3: explain testing procedures, conduction of experiments and describe the predicted outcomes of testing O4: demonstrate mastery of more complex grammatical structures							
1.2. Students' obligations							
2 preliminary exams or the written exam Oral exam							
1.3. Students' performance monitoring							
Class attendance		Class participation	0.5	Seminar paper		Experimental work	
Written exam	1	Oral exam	0.5	Essay		Research	
Project		Continuous assessment		Class report		Practical work	
Portfolio							

4th semester (SS)

General information				
Course instructor	Zoran Vrhovski Danijel Radočaj			
Course title	Microcomputers			
Programme of study	Undergraduate professional programme of study in Mechatronics Undergraduate professional programme of study in Computer Science			
Course status	Compulsory			
Year	2nd, SS			
ECTS	4			
Type of classes (number of contact hours)	Lectures	Practical sessions*		Seminars
	15	APS	LPS	0
		0	30	

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION
1.1. Expected learning outcomes
Upon completion of this course students will be able to: O1: choose a microcomputer that is optimal for a given purpose from the aspect of price, features and availability O2: configure microcomputer operation using registers in the development software environment O3: create a microcontroller control program for a given purpose in the development software environment O4: use microcontroller interrupts when it is required by the functionality of an electronic device koristiti O5: connect electronic devices to a microcontroller taking into account the purpose of an individual pin of a microcontroller
1.2. Students' obligations
Laboratory sessions Project
1.3. Students' performance monitoring

Class attendance		Class participation		Seminar paper		Experimental work	
Written exam		Oral exam	0.4	Essay		Research	
Project	3.2	Continuous assessment		Class report		Practical work	0.4
Portfolio							

General information			
Course instructor	**Krunoslav Husak**		
Course title	**C# Programming**		
Programme of study	Undergraduate professional programme of study in Computer Science		
Course status	Compulsory		
Year	2nd, SS		
ECTS	5		
Type of classes (number of contact hours)	Lectures	Practical sessions*	Seminars
	30	APS: 0 / LPS: 30	0

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION
1.1. Expected learning outcomes
Upon completion of this course students will be able to: O1: recognise and use the syntax of the programming language C#, O2: use and apply the basic concepts of the object-oriented paradigm in C#, O3: use and apply advanced concepts of the object-oriented paradigm and collections in C#, O4: apply multithreading for the purpose of developing responsive C# computer programs, O5: develop and design programs with a graphical user interface, O6: develop and design programs for communicating with the external environment.
1.2. Students' obligations
Laboratory sessions Project
1.3. Students' performance monitoring

Class attendance		Class participation		Seminar paper		Experimental work	
Written exam	1	Oral exam		Essay		Research	
Project	3	Continuous assessment		Class report		Practical work	1
Portfolio							

General information			
Course instructor	Krešimir Markota		
Course title	Fundamentals of Programming in JAVA		
Programme of study	Undergraduate professional programme of study in Computer Science		
Course status	Compulsory		
Year	2nd, SS		
ECTS	5		
Type of classes (number of contact hours)	Lectures	Practical sessions*	Seminars
	30	APS: 0 / LPS: 30	0

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION
1.1. Expected learning outcomes
Upon completion of this course students will be able to: O1: Design a solution to a given problem according to a given specification and implement it using objects and classes O2: Apply the inheritance principle in the programming language Java O3: Apply error management in the programming language Java O4: Apply interfaces and abstract classes in the programming language Java O5: Apply collections and generic structures in the programming language Java O6: Apply input and output streams in Java O7: Apply Swing classes in creating GUI applications O8: Design a multithreaded solution to a given problem according to the specifications
1.2. Students' obligations
Laboratory sessions Project
1.3. Students' performance monitoring

Class attendance		Class participation		Seminar paper		Experimental work	
Written exam	1	Oral exam		Essay		Research	
Project	4	Continuous assessment		Class report		Practical work	
Portfolio							

General information				
Course instructor	**Tomislav Adamović**			
Course title	**Web Programming 2**			
Programme of study	Undergraduate professional programme of study in Computer Science			
Course status	Compulsory			
Year	2nd, SS			
ECTS	6			
Type of classes (number of contact hours)	Lectures	Practical sessions*		Seminars
	30	APS	LPS	0
		0	30	

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION

1.1. Expected learning outcomes

Upon completion of this course students will be able to:
O1: explain the concepts of backend programming and PHP settings on a server
O2: use PHP programming elements for generating a HTML page
O3: use PHP in object-oriented programming
O4: use the MySQL base
O5: integrate PHP and MySQL
O6: explain the Node.js concept and create a web application in Node.js

1.2. Students' obligations

Laboratory sessions
Project

1.3. Students' performance monitoring

Class attendance		Class participation		Seminar paper		Experimental work	
Written exam	1.2	Oral exam		Essay		Research	
Project	4.8	Continuous assessment		Class report		Practical work	
Portfolio							

General information				
Course instructor	Dario Vidić			
Course title	Operating Systems			
Programme of study	Undergraduate professional programme of study in Computer Science			
Course status	Compulsory			
Year	2nd, SS			
ECTS	4			
Type of classes (number of contact hours)	Lectures	Practical sessions*		Seminars
	30	APS	LPS	0
		0	15	

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION

1.1. Expected learning outcomes

Upon completion of this course students will be able to:
O1: interpret a simple computer model,
O2: analyse the interrupt system operation on a computer,
O3: explain the processes and inter-process communication,
O4: explain threads and inter-thread communication,
O5: explain memory management principles,
O6: interpret a file subsystem and analyse multiple disk redundant containers,
O7: analyse operating system security management techniques,
O8: analyse the main features of multiprocessor and embedded systems,
O9: develop computer programs and solutions that shall be accomplished using operating system functions.

1.2. Students' obligations

Laboratory sessions

1.3. Students' performance monitoring

Class attendance	0.5	Class participation		Seminar paper		Experimental work	
Written exam	1.5	Oral exam	1	Essay		Research	
Project		Continuous assessment	0.5	Class report		Practical work	0.5
Portfolio							

General information				
Course instructor	Ivana Jurković			
Course title	Technical English 4			
Programme of study	Undergraduate professional programme of study in Computer Science			
Course status	Compulsory			
Year	2nd, SS			
ECTS	2			
Type of classes (number of contact hours)	Lectures	Practical sessions*		Seminars
	15	APS	LPS	0
		30	0	

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION							
1.1. Expected learning outcomes							
Upon completion of the course students will be able to use the English language to: O1: describe examples of advanced technologies and innovative solutions, O2: communicate in via e-mail, O3: draft a curriculum vitae and job application in standard international formats, O4: prepare and give a 10-minute presentation in English on one of the given topics in the technical area.							
1.2. Students' obligations							
2 preliminary exams or the written exam Oral exam							
1.3. Students' performance monitoring							
Class attendance		Class participation	0.5	Seminar paper		Experimental work	
Written exam	1	Oral exam		Essay		Research	
Project		Continuous assessment		Class report		Practical work	
Portfolio		Presentation	0.5				

5th semester (WS)

General information				
Course instructor	Krunoslav Husak			
Course title	.NET Programming			
Programme of study	Undergraduate professional programme of study in Computer Science			
Course status	Compulsory			
Year	3rd, WS			
ECTS	6			
Type of classes (number of contact hours)	Lectures	Practical sessions*		Seminars
	30	APS	LPS	0
		0	30	

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION
1.1. Expected learning outcomes
Upon completion of this course students will be able to: O1: create a simple web application using Web Forms, O2: create a simple web application using Core Pages, O3: create a simple web application using Core MVC, O4: create a simple web application using Xamarin.
1.2. Students' obligations
Laboratory sessions Project
1.3. Students' performance monitoring

Class attendance		Class participation		Seminar paper		Experimental work	
Written exam	1.2	Oral exam		Essay		Research	
Project	4.8	Continuous assessment		Class report		Practical work	
Portfolio							

General information				
Course instructor	Krešimir Markota			
Course title	Mobile Application Development			
Programme of study	Undergraduate professional programme of study in Computer Science			
Course status	Compulsory			
Year	3rd, WS			
ECTS	6			
Type of classes (number of contact hours)	Lectures	Practical sessions*		Seminars
	30	APS	LPS	0
		0	30	

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION
1.1. Expected learning outcomes
Upon completion of this course students will be able to: O1: describe platform architecture and use basic development components for the implementation of the development component for mobile platform solutions, O2: develop a basic application using basic elements for the development of a mobile application: dialogues, menus and settings, O3: develop and use databases and allow access to the application data, O4: use location, telephone, SMS, e-mail and web services.
1.2. Students' obligations
Laboratory sessions Project
1.3. Students' performance monitoring

Class attendance		Class participation		Seminar paper		Experimental work	
Written exam		Oral exam		Essay		Research	
Project	6	Continuous assessment		Class report		Practical work	
Portfolio							

General information				
Course instructor	**Krunoslav Husak**			
Course title	**Internet of Things**			
Programme of study	Undergraduate professional programme of study in Computer Science			
Course status	Compulsory			
Year	3rd, WS			
ECTS	5			
Type of classes (number of contact hours)	Lectures	Practical sessions*		Seminars
	30	APS	LPS	0
		0	30	

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION
1.1. Expected learning outcomes
Upon completion of this course students will be able to: O1: Explain the architecture and features of the Internet of Things, O2: Construct the client part of an IoT based solution using a microcontroller i suitable sensors and actuators, O3: Construct the server part of an IoT-based solution using your own of the implemented solution or by using services in the computer cloud, O4: Choose a client and server platform to implement a solution based on Internet of things. Design a complete solution based on the Internet of Things
1.2. Students' obligations
Laboratory sessions Project
1.3. Students' performance monitoring

Class attendance		Class participation		Seminar paper		Experimental work	
Written exam	1	Oral exam		Essay		Research	
Project	3	Continuous assessment		Class report		Practical work	1
Portfolio							

General information				
Course instructor	**Ivan Sekovanić**			
Course title	**Application of Blockchain Technology**			
Programme of study	Undergraduate professional programme of study in Computer Science			
Course status	Elective			
Year	3rd, WS			
ECTS	4			
Type of classes (number of contact hours)	Lectures	Practical sessions*		Seminars
	15	APS	LPS	0
		0	30	

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION
1.1. Expected learning outcomes
Upon completion of this course students will be able to: O1: describe network programming principles O2: describe capability and theory of blockchain technology O3: utilize functions and tools for interaction with blockchain O4: write smart contratcs for blockchain network
1.2. Students' obligations
15 laboratory sessions
1.3. Students' performance monitoring

Class attendance		Class participation	0.14	Seminar paper		Experimental work	
Written exam	3.08	Oral exam		Essay		Research	
Project		Continuous assessment		Class report		Practical work	0.78
Portfolio							

General information				
Course instructor	**Tomislav Adamović**			
Course title	**Field Practice 1**			
Programme of study	Undergraduate professional programme of study in Computer Science			
Course status	Compulsory			
Year	3rd, WS			
ECTS	3			
Type of classes (number of contact hours)	Lectures	Practical sessions*		Seminars
	0	APS	LPS	10
		0	80	

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION							
1.1. Expected learning outcomes							
Upon completion of this course students will be able to: O1: analyse business processes within a company, O2: assess the usage proportion of individual technologies in a concrete IT project, O3: design their own application or a part of a concrete application, write the pseudocode and implement it.							
1.2. Students' obligations							
Do the field practice hours							
1.3. Students' performance monitoring							
Class attendance		Class participation		Seminar paper		Experimental work	
Written exam		Oral exam		Essay		Research	
Project		Continuous assessment		Class report		Practical work	3
Portfolio							

6th semester (SS)

General information				
Course instructor	Dario Vidić			
Course title	Computer and Data Security			
Programme of study	Undergraduate professional programme of study in Computer Science			
Course status	Compulsory			
Year	3rd, SS			
ECTS	6			
Type of classes (number of contact hours)	Lectures	Practical sessions*		Seminars
	30	APS	LPS	0
		0	30	

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION
1.1. Expected learning outcomes
Upon completion of this course students will be able to: O1: describe the basic concepts of security and security threats to operating systems, O2: explain weaknesses of operating systems and software, and apply enhancements on a concrete operating system, O3: explain security weaknesses of databases and describe the methods of security risk reduction, O4: compare and use protocols that allow for the security or networks and mobile devices, O5: explain and apply basic cryptography methods while using computer systems.
1.2. Students' obligations
Laboratory sessions
1.3. Students' performance monitoring

Class attendance		Class participation		Seminar paper	0.6	Experimental work	
Written exam	3	Oral exam		Essay		Research	
Project		Continuous assessment	0.6	Class report		Practical work	1.8
Portfolio							

General information				
Course instructor	**Tomislav Adamović**			
Course title	**Field Practice 2**			
Programme of study	Undergraduate professional programme of study in Computer Science			
Course status	Compulsory			
Year	3rd, SS			
ECTS	5			
Type of classes (number of contact hours)	Lectures	Practical sessions*		Seminars
	0	APS	LPS	10
		0	140	

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION							
1.1. Expected learning outcomes							
Upon completion of this course students will be able to: O1: analyse business processes within a company, O2: assess the usage proportion of individual technologies in a concrete IT project, O3: design their own application or a part of a concrete application, write the pseudocode and implement it.							
1.2. Students' obligations							
Do the field practice hours							
1.3. Students' performance monitoring							
Class attendance		Class participation		Seminar paper		Experimental work	
Written exam		Oral exam		Essay		Research	
Project		Continuous assessment		Class report		Practical work	5
Portfolio							

General information				
Course instructor	**Ante Javor**			
Course title	**Computer and Robot Vision**			
Programme of study	Undergraduate professional programme of study in Computer Science			
Course status	Elective			
Year	3rd, SS			
ECTS	4			
Type of classes (number of contact hours)	Lectures	Practical sessions*		Seminars
	30	APS	LPS	0
		0	15	

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION
1.1. Expected learning outcomes
Upon completion of this course students will be able to: O1: differentiate between digital image management methods, formats and camera models O2: apply basic algorithms and operations for digital image processing O3: apply basic algorithms for image analysis from the field of computer vision O4: analyze software solutions based on image processing and computer vision algorithms O5: implement a software solution based on image processing and computer vision algorithms
1.2. Students' obligations
Project assignment Laboratory sessions
1.3. Students' performance monitoring

Class attendance		Class participation		Seminar paper		Experimental work	
Written exam		Oral exam		Essay		Research	
Project	4	Continuous assessment		Class report		Practical work	
Portfolio							

General information			
Course instructor	Krešimir Markota		
Course title	Introduction to Artificial Intelligence		
Programme of study	Undergraduate professional programme of study in Computer Science		
Course status	Elective		
Year	3rd, SS		
ECTS	4		
Type of classes (number of contact hours)	Lectures	Practical sessions*	Seminars
	30	APS: 0 / LPS: 15	0

*APS - auditory practical sessions LPS- laboratory practical sessions

1. COURSE DESCRIPTION

1.1. Expected learning outcomes

Upon completion of this course students will be able to:
O1: define the basic concepts of artificial intelligence
O2: propose a way to solve a specific problem within the framework of machine learning
O3: apply state space search algorithms and biologically inspired optimization algorithms to simpler problems
O4: compare fuzzy logic with classical logic and give examples of fuzzy logic can apply
O5: evaluate the applicability of individual artificial intelligence approaches to a given problem

1.2. Students' obligations

Laboratory sessions

1.3. Students' performance monitoring

Class attendance		Class participation		Seminar paper		Experimental work	
Written exam	4	Oral exam		Essay		Research	
Project		Continuous assessment		Class report		Practical work	
Portfolio							