OBSAH

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KIN/In-BD109B/22	**Course title:** Basics of Electrical Engineering
Type and range of planned learning activities and teaching methods: **Form of instruction:** Lecture / Seminar **Recommended study range:** **hours weekly:** 1 / 1 **hours per semester:** 13 / 13 **Teaching method:** on-site	
Credits: 2	**Working load:** 50 hours
Recommended semester/trimester: 5.	
Level of study: I.	
Prerequisities:	
Requirements for passing the course: Final assessment: Final test at the end of the semester (50%) final practical work in the electrical laboratory (50%). Subject evaluation: A – 100%-93% B – 92%-85% C – 84%-77% D – 76%-69% E – 68%-60% Fx – 59%- 0%	
Learning outcomes of the course: Objective of the subject: To acquaint students with the basics of electrical engineering as well as safety when working on electrical equipment. To acquire practical skills in the electrical laboratory. Learning outcomes (knowledge, skills and competences): - The student will know the basics of electrical engineering and safety when working with electricity. devices. - He will be able to solder, produce a printed circuit board by drawing and transferring toner, etch, drill, fit parts and revive simple electronic devices. Verification of the level of acquired knowledge, skills and competences: Verification of the degree of acquisition of the relevant knowledge, skills and competences of the student is carried out on the basis of theoretical and practical examinations at the end of the semester teaching of the subject.	
Course contents: 1. Basic terms from electrical engineering (physical quantities, generation of electric current, conductivity) safety of work on electricity. devices 2. Resistors, resistance, series and parallel connection. 3. Ohm's law, Kirchoff's laws, electric power and power consumption. 4. DC circuit power sources. 5. Electrostatic fields, capacity, capacitors.	

6. Electromagnetic induction, coil inductance.
7. Semiconductors (PN junctions, principle of operation of diodes and transistors)
8. Sensors of non-electric quantities (magnetometer, gyroscope, accelerometer)
9. Design and production of printed circuit boards with through-hole technology (THT). Surface Mount (SMT) Basics
10. Technological procedures for soldering electronic elements.
11. Use of development boards, sensors and actuators for home monitoring and control automation via the Internet - hardware part.
12. Connecting development boards with cloud-based IoT analytics platforms for remote aggregation and monitoring of data from sensors and control of actuators - software part.

Recommended or required literature:

1. BASTIAN, P.: Practical electrical engineering. Prague: Europa-Sobotáles, 2006, 2nd edit. ed., 303 pp., ISBN: 80-86706-15-X.
2. MICHALÍK, J.: Elektrotechnika. Žilina: University of Žilina, 2004, 1st ed., 182 pp., ISBN: 80-8070-348-5.
3. MERAVÝ, J.: Electrotechnical competence for non-electricians. Trenčín: Ján Meravý, 2011, 2nd update. ed., 166 pp., ISBN: 978-80-89576-00-5.
4. RAUNER, K.: Electronics: (physical and analog part). Pilsen: University of West Bohemia, Faculty of Education, 2001, 2nd edit. ed., 197 pp., ISBN: 80-7082-775-0.
5. ROJČEK, M.: electronic study support for teaching the subject Basics of electrical engineering, available online at: https://moodle.pf.ku.sk

Language of instruction:
Slovak Language

Notes:

Course evaluation:
Assessed students in total: 1

A	B	C	D	E	FX
0.0	100.0	0.0	0.0	0.0	0.0

Name of lecturer(s): PaedDr. Michal Rojček, PhD.

Last modification: 01.08.2022

Supervisor(s):
Guarantor:
doc. Ing. Igor Černák, PhD.
Person responsible for the delivery, development and quality of the study programme:
doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok

Faculty: Faculty of Education

Course code: KIN/In-BD111A/22	**Course title:** Basics of Electronic Education

Type and range of planned learning activities and teaching methods:
Form of instruction: Lecture / Seminar
Recommended study range:
hours weekly: 1 / 2 **hours per semester:** 13 / 26
Teaching method: on-site

Credits: 3	**Working load:** 75 hours

Recommended semester/trimester: 5.

Level of study: I.

Prerequisities:

Requirements for passing the course:

Learning outcomes of the course:

Course contents:

Recommended or required literature:

Language of instruction:

Notes:

Course evaluation:
Assessed students in total: 5

A	B	C	D	E	FX
20.0	40.0	40.0	0.0	0.0	0.0

Name of lecturer(s): Ing. Janka Majherová, PhD.

Last modification: 29.08.2022

Supervisor(s):
Guarantor:
doc. Ing. Igor Černák, PhD.
Person responsible for the delivery, development and quality of the study programme:
doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KIN/In-BD106B/22	**Course title:** Children Friendly Programming Languages 2
Type and range of planned learning activities and teaching methods: **Form of instruction:** Seminar **Recommended study range:** **hours weekly:** 1 **hours per semester:** 13 **Teaching method:** on-site	
Credits: 2	**Working load:** 50 hours
Recommended semester/trimester: 4.	
Level of study: I.	
Prerequisities:	
Requirements for passing the course: Continuous assessment: partial activities of the subject according to the semester assignment (50%). Final assessment: development, submission and defense of the final project (50%). Subject evaluation: A – 100%-93% B – 92%-85% C – 84%-77% D – 76%-69% E – 68%-60% Fx – 59%- 0%	
Learning outcomes of the course: Objective of the subject: To know children's programming languages. Familiarize yourself with the environment of one children's programming language, learn to work and program in this environment and create projects. Learning outcomes: After completing the subject, the student will acquire the following knowledge, skills and competences: ~ has an overview of children's programming languages, ~ master the basic conceptual apparatus from the field of the selected children's programming language and its creation, ~ knows how to work in the environment of this language, ~ can use acquired knowledge and skills when creating a project, ~ can present a project in front of classmates.	
Course contents: Children's programming languages, microworlds. Command sequence. A cycle with a known number of steps. Using variables. Loop control variable in a loop with a known number of steps. Subroutine, subroutine with parameters. Conditional statement incomplete, relational and logical operators. Conditional command complete. A loop with a condition. Lists. Recursion. Creation of projects.	

Recommended or required literature:

Lovászová, G., Galbavá, Ľ., Palmárová, V., Tomcsányiová, M., 2010. Malé programovacie jazyky. Bratislava, 2010. https://www.statpedu.sk/files/sk/o-organizacii/projekty/projekt-dvui/publikacie/male_programovacie_jazyky.pdf
Hornik, T., Musílek, M., Milková, E., 2019: Didaktika programování. https://imysleni.cz/images/vyukove_materialy/UHK_Didaktika_programovani.pdf
Drábková, J., 2019: Didaktika programování. https://imysleni.cz/images/vyukove_materialy/TUL_Didaktika_programovani.pdf
SCRATCH. https://scratch.mit.edu/,
SCRATCH. Výuka kreatívneho programovania. https://www.scratch.sk/
Scratch CUP. http://www.edu.fmph.uniba.sk/ScratchCup/
Jacková, J., Majherová, J., Petrušková, H.: Detské programovacie jazyky (DPrgJ), študijná elektronická podpora https://moodle.pf.ku.sk/course/view.php?id=108

Language of instruction:
Slovak

Notes:

Course evaluation:
Assessed students in total: 4

A	B	C	D	E	FX
0.0	25.0	50.0	0.0	0.0	25.0

Name of lecturer(s): Ing. Jana Jacková, PhD.

Last modification: 06.12.2022

Supervisor(s):
Guarantor:
doc. Ing. Igor Černák, PhD.
Person responsible for the delivery, development and quality of the study programme:
doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KIN/In-BD103A/22	**Course title:** Computer Networks 1
Type and range of planned learning activities and teaching methods: **Form of instruction:** Lecture / Seminar **Recommended study range:** **hours weekly:** 2 / 1 **hours per semester:** 26 / 13 **Teaching method:** on-site	
Credits: 3	**Working load:** 75 hours
Recommended semester/trimester: 2.	
Level of study: I.	
Prerequisities:	
Requirements for passing the course: During the semester, the student demonstrates his theoretical knowledge in the areas of building and operating local and large-scale computer networks based on the TCP/IP protocol in the form of a presentation of knowledge and written tests. Final assessment: cumulative percentage gain from the written test (30%) obtained during the semester and the answers to the semester exam (70%). Subject evaluation: A – 100%-93% B – 92%-85% C – 84%-77% D – 76%-69% E – 68%-60% Fx – 59%- 0%	
Learning outcomes of the course: The aim of the course is to provide students with theoretical knowledge in the field of building and operating local and large-scale computer networks based on the TCP/IP protocol. Learning outcomes (knowledge, skills and competences): - The student will be able to define, explain and establish solutions to the basic rules in the field of building and operating local and large-scale computer networks based on the TCP/IP protocol, define the activity of active elements in a local and large-scale network, the activity of network services providing users with access to the Internet, the ISO model /OSI, TCP/IP protocol model, network topologies, network addressing, network protection. - He will have basic skills in creating an address plan. - Will be able to solve basic problems when working with LAN computer networks - Will be able to conceptually design simple LAN networks. Verification of the level of acquired knowledge, skills and competences: The verification is carried out on the basis of theoretical checks during the semester teaching of the subject and on the semester exam.	
Course contents: 1. Introduction to computer networks.	

2. Network classification, data security, modulation and coding.
3. Multiplexing, interconnection methods, transmission modes, management in the network.
4. Transmission media, LAN topology, LAN architectures.
5. Architectures Eternet, Token, FDDI, Arcnet.
6. ISO-OSI model.
7. Connecting local networks, network devices.
8. Addressing in networks.
9. Protocols of higher layers.
10. ATM technology.
11. Standards in computer networks, network protection.
12. Other types of networks, development directions, applications and IoT devices connected via mobile networks.

Recommended or required literature:

VOLNER, R., PETRUŠKOVÁ, H. 2015. Computer networks. Ružomberok: Verbum, 260 p.
HORÁK, J., KERŠLAGER, M. 2013. Computer networks for the novice administrator. Prague: Computer Press.
JIROVSKÝ, V. 2001. Vadamecum network administrator, Grada, Prague.
JENČO, M. Electronic study support for teaching the subject Computer networks 1, moodle.pf.ku.sk

Language of instruction:

Notes:

Course evaluation:
Assessed students in total: 7

A	B	C	D	E	FX
28.57	0.0	28.57	14.29	14.29	14.29

Name of lecturer(s): doc. Ing. Michal Jenčo, PhD.

Last modification: 25.07.2022

Supervisor(s):

Guarantor:
doc. Ing. Igor Černák, PhD.

Person responsible for the delivery, development and quality of the study programme:
doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KIN/In-BD109A/22	**Course title:** Computer Networks 2
Type and range of planned learning activities and teaching methods: **Form of instruction:** Lecture / Seminar **Recommended study range:** **hours weekly:** 1 / 1 **hours per semester:** 13 / 13 **Teaching method:** on-site	
Credits: 2	**Working load:** 50 hours
Recommended semester/trimester: 4.	
Level of study: I.	
Prerequisities: KIN/In-BD103A/22	
Requirements for passing the course: During the semester, the student demonstrates his theoretical knowledge and practical skills in the areas of building and operating local and large-scale computer networks based on the TCP/IP protocol in the form of a presentation of knowledge and partial practical tests. Final evaluation: total percentage gain from the presentation of knowledge and partial tasks (30%) obtained during the semester and the final practical test (70%). Subject evaluation: A – 100%-93% B – 92%-85% C – 84%-77% D – 76%-69% E – 68%-60% Fx – 59%- 0%	
Learning outcomes of the course: The aim of the subject is to provide students with theoretical knowledge and practical skills in the field of building and operating local and large-scale computer networks based on the TCP/IP protocol. Clarification of the activity of active elements in the local and large-scale network, the activity of network services providing users with access to the Internet. Using the CPT network simulator and creating a small computer network. Learning outcomes (knowledge, skills and competences): - The student will be able to define and explain the principles of building and operating local and large-scale computer networks based on the TCP/IP protocol. Define active and passive network elements, TCP/IP address, mac address, DNS, DHCP. - Will have basic skills in creating a network address plan and setting up network elements. - Will be able to solve basic problems in LAN setup and testing. - Will be able to conceptually design a simple LAN network. Verification of the level of acquired knowledge, skills and competences: Verification is carried out on the basis of theoretical and practical checks during the semester teaching of the subject and on the final practical test.	
Course contents:	

1. Passive elements of the network - computer cables and connectors, sockets.
2. Active network elements - data switches - hub, switch, router, bridge. Network simulator.
3. TCP/IP protocol - mac address, IP address, netmask, default gateway, DNS, DHCP.
4. Commands ping, ipconfig, tracert.
5. Direct connection of two PCs using a network cable.
6. Connecting two PCs using a network cable via a data switch.
7. Connecting the PC, network switch to the output router of the network.
8. Setting up a small business network.
9. Telnet protocol, SSH protocol, practical setting.
10. Server, Router, Firewall, Proxy server, Mail server, DNS.
11. TFTP, FTP (File Transfer Protocol), FTPS, sFTP, SCP, client-server protocol.
12. HTTP (HyperText Transfer Protocol), HTTP server, DHCP server, Wifi.
13. Setting up the network on the simulator - practical test.

Recommended or required literature:

VOLNER, R., PETRUŠKOVÁ, H. 2015. Computer networks. Ružomberok: Verbum, 260 p.
HORÁK, J., KERŠLAGER, M. 2013. Computer networks for the novice administrator. Prague: Computer Press.
JIROVSKÝ, V. 2001. Vadamecum network administrator, Grada, Prague.
JENČO, M. Electronic study support for teaching the subject Computer networks 2, moodle.pf.ku.sk

Language of instruction:

Notes:

Course evaluation:

Assessed students in total: 2

A	B	C	D	E	FX
50.0	50.0	0.0	0.0	0.0	0.0

Name of lecturer(s): doc. Ing. Michal Jenčo, PhD.

Last modification: 26.07.2022

Supervisor(s):

Guarantor:

doc. Ing. Igor Černák, PhD.

Person responsible for the delivery, development and quality of the study programme:

doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok

Faculty: Faculty of Education

Course code: KIN/In-BD104B/22	**Course title:** Database Systems

Type and range of planned learning activities and teaching methods:
Form of instruction: Lecture / Seminar
Recommended study range:
hours weekly: 1 / 1 **hours per semester:** 13 / 13
Teaching method: on-site

Credits: 2	**Working load:** 50 hours

Recommended semester/trimester: 3.

Level of study: I.

Prerequisities:

Requirements for passing the course:

Learning outcomes of the course:

Course contents:

Recommended or required literature:

Language of instruction:

Notes:

Course evaluation:
Assessed students in total: 2

A	B	C	D	E	FX
0.0	100.0	0.0	0.0	0.0	0.0

Name of lecturer(s): PaedDr. Michal Rojček, PhD., Ing. Janka Majherová, PhD.

Last modification: 25.02.2022

Supervisor(s):
Guarantor:
doc. Ing. Igor Černák, PhD.
Person responsible for the delivery, development and quality of the study programme:
doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KIN/In-BD114A/22	**Course title:** Didactics (Informatics)
Type and range of planned learning activities and teaching methods: **Form of instruction:** Seminar **Recommended study range:** **hours weekly:** 1 **hours per semester:** 13 **Teaching method:** on-site	
Credits: 1	**Working load:** 25 hours
Recommended semester/trimester: 6.	
Level of study: I.	
Prerequisities:	
Requirements for passing the course: During the semester, the student solves the theoretical and practical tasks of the subject. Final evaluation based on the total number of points obtained from the completed tasks. Subject evaluation: A – 100%-93% B – 92%-85% C – 84%-77% D – 76%-69% E – 68%-60% Fx – 59%- 0%	
Learning outcomes of the course: Objective of the subject: To expand and apply acquired knowledge and skills from pedagogy and general didactics to the subject of computer science. Theoretical and practical knowledge is applied in understanding the content and forms of teaching informatics determined by the Innovative State Education Program (ISCED 2, ISCED 3). Learning outcomes: After completing the subject, the student will acquire the following knowledge, skills and competences: - can apply knowledge from pedagogy and general didactics to the subject of computer science, - can develop a logical-didactic analysis of a thematic unit from school informatics (ISCED 2), - is familiar with the content and results of selected international and national research in the field of computer science teaching and their impact on school computer science, - has an overview of innovative methods suitable for teaching informatics.	
Course contents: State educational program (ISCED 1, ISCED 2, ISCED 3) for the subject of computer science. Competences of the informatics teacher. The structure of the informatics lesson. Logical-didactic analysis of the thematic unit. Assessment and classification in computer science teaching. Innovative methods in teaching informatics. International and national research in the field of computer science teaching.	

Recommended or required literature:

Petlák, E.: Všeobecná didaktika. Bratislava: IRIS, 1997. ISBN 80-88778-49-2
Turek, I.: Didaktika. 3.vyd. Wolters Kluwer, 2014.
Kalhous, O. a kol.: Školní didaktika, Portál 2009, ISBN 978-80-7367-571-4
Varga, M., Kalaš, I., Tomcsányiová, M.: Didaktika informatiky na ZŠ. Bratislava, 2011. https://www.statpedu.sk/files/sk/o-organizacii/projekty/projekt-dvui/publikacie/didaktika_informatiky_na_zs.pdf
Inovovaný Štátny vzdelávací program https://www.statpedu.sk/sk/svp/inovovany-statny-vzdelavaci-program/
Matematika a práca s informáciami. In: Inovovaný ŠVP (Štátny vzdelávací program) pre 2. stupeň ZŠ. https://www.statpedu.sk/sk/svp/inovovany-statny-vzdelavaci-program/inovovany-svp-2.stupen-zs/.
Guniš, J., Sudolská, M., Šnajder, Ľ.: Aktivizujúce metódy vo výučbe školskej informatiky. Bratislava, 2009. https://www.statpedu.sk/files/sk/o-organizacii/projekty/projekt-dvui/publikacie/aktivizujuce_metody.pdf
Učebnice informatiky pre 2. stupeň základnej školy
Zborníky konferencie DidInfo http://didinfo.net/predchozi-rocniky

Language of instruction:
Slovak

Notes:

Course evaluation:
Assessed students in total: 5

A	B	C	D	E	FX
80.0	0.0	0.0	0.0	0.0	20.0

Name of lecturer(s): Ing. Jana Jacková, PhD.

Last modification: 06.12.2022

Supervisor(s):

Guarantor:
doc. Ing. Igor Černák, PhD.

Person responsible for the delivery, development and quality of the study programme:
doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KIN/In-BD101A/22	**Course title:** Discrete Mathematics
Type and range of planned learning activities and teaching methods: **Form of instruction:** Lecture / Seminar **Recommended study range:** **hours weekly:** 1 / 1 **hours per semester:** 13 / 13 **Teaching method:** on-site	
Credits: 2	**Working load:** 50 hours
Recommended semester/trimester: 1.	
Level of study: I.	
Prerequisities:	
Requirements for passing the course: During the semester, there will be two written examinations at the exercises, for each of which a maximum of 50 points can be obtained. The maximum number of points that can be obtained is 100. The minimum number of points obtained for a satisfactory assessment of the student's knowledge is 60.	
Learning outcomes of the course: Objective of the subject: to provide students with basic knowledge of set theory, relations and operations on sets, matrix theory, and graph theory for a better mastery of the programming subject. Learning outcomes: After completing the subject, the student will acquire the following knowledge, skills and competences: - basic knowledge of relations and operations on sets, will be able to determine their basic properties and use in programming, - basic knowledge of set theory, countable and uncountable sets - calculation of their cardinality and operations with sets, - master basic algorithms from graph theory - min/max skeleton, minimum path, sequence and Euler move and sequence.	
Course contents: 1. Cardinality of sets, finite, countable and uncountable sets, injective, surjective and bijective representations. 2. Operations on sets, sessions on sets. 3. Partial arrangement on a set 4. Matrices, operations with matrices, transposed, inverse matrix, 5. Number systems 6. Basic terms from graph theory, vertex degree, connectedness in graphs, isomorphism of graphs, directed graphs, definition of connection and strong connection, applications. 7. Representation of graphs, definition of adjacency matrix and incidence matrix, their application to determine properties of graphs. Connection of directed graphs, trees and skeletons, definition, characterization, applications, minimum and maximum skeleton search algorithm.	

8. Graph exploration, labyrinths and algorithms for graph exploration, Tarry's algorithm. extremal paths, algorithms for finding minimal and maximal paths and paths, Dijkstra's, Floyd's algorithm.
9. Euler stroke and sequence, definition, characterization, applications. Fleury and Edmonson algorithm.
10. Hamiltonian graphs.

Recommended or required literature:

[1] GALANOVÁ, J., KAPRÁLIK, P. : Diskrétna matematika, STU, Bratislava 1997
[2] BUKOVSKÝ, L. : Množiny a všeličo okolo nich, Alfa Bratislava, 1985
[3] FRONC, M.,B. : Teória grafov, VŠDS, Žilina, 1993
[4] WIRTH, N. : Algoritmy a štruktúry údajov, Alfa Bratislava, 1989
[5] DEMEL, J. : Grafy a jejich aplikace, Academia 2002

Language of instruction:
slovak language

Notes:

Course evaluation:
Assessed students in total: 6

A	B	C	D	E	FX
16.67	0.0	0.0	16.67	50.0	16.67

Name of lecturer(s): RNDr. Štefan Tkačik, PhD.

Last modification: 14.07.2022

Supervisor(s):
Guarantor:
doc. Ing. Igor Černák, PhD.
Person responsible for the delivery, development and quality of the study programme:
doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KIN/In-BD100C/22	**Course title:** Discrete Mathematics Practice
Type and range of planned learning activities and teaching methods: **Form of instruction:** Seminar **Recommended study range:** **hours weekly:** 2 **hours per semester:** 26 **Teaching method:** on-site	
Credits: 2	**Working load:** 50 hours
Recommended semester/trimester: 1.	
Level of study: I.	
Prerequisities:	
Requirements for passing the course: During the semester, students solve supplementary tasks from the Discrete Mathematics subject. During the semester, students prepare a program on a topic from the Discrete Mathematics subject, the program must be functional and the topic must be jointly agreed with the teacher. If the student decides to prepare more theoretically for the given subject and does not complete the program, he will have to pass the paper during the semester.	
Learning outcomes of the course: The aim of the subject: to provide students with basic applications of the knowledge they acquire in the Discrete Mathematics subject, they will learn basic algorithms from the given area for better mastering the subject of programming. Learning outcomes: After completing the subject, the student will acquire the following knowledge, skills and competences: - apply basic knowledge about relations and operations on sets, will be able to determine their basic properties and use in programming, - apply basic knowledge of set theory, countable and uncountable sets - calculation of their cardinality and operations with sets, - master basic algorithms from graph theory - min/max skeleton, minimum path, sequence and Euler move and sequence.	
Course contents: 1. Cardinality of sets, finite, countable and uncountable sets, injective, surjective and bijective representations. 2. Operations on sets, sessions on sets. 3. Partial arrangement on a set 4. Matrices, operations with matrices, transposed, inverse matrix, 5. Number systems 6. Basic terms from graph theory, vertex degree, connectedness in graphs, isomorphism of graphs, directed graphs, definition of connection and strong connection, applications.	

7. Representation of graphs, definition of adjacency matrix and incidence matrix, their application to determine properties of graphs. Connection of directed graphs, trees and skeletons, definition, characterization, applications, minimum and maximum skeleton search algorithm.
8. Binary trees, basic operations, search, vertex addition and deletion, balanced trees
9. Graph Search, Labyrinths and Graph Search Algorithms, Tarry's Algorithm. extremal paths, algorithms for finding the minimum and maximum path and path, Dijkstra's, Floyd's algorithm.
10. Euler stroke and sequence, problem about the Chinese postman, definition, characterization, applications. Fleury and Edmonson algorithm.
11. Hamiltonian graphs

Recommended or required literature:

1. GALANOVÁ, J., KAPRÁLIK, P.: Diskrétna matematika, STU, Bratislava 1997
http://zeus.elf.stuba.sk/Katedry/KM/predmety/diskmat/skripta.htm
2. BUKOVSKÝ, L.: Množiny a všeličo okolo nich, Alfa Bratislava, 1985
3. PALÚCH, S.: Algoritmická teória grafov https://frcatel.fri.uniza.sk/users/paluch/
4. FRONC, M.,B.: Teória grafov, VŠDS, Žilina, 1993
5. WIRTH, N.: Algoritmy a štruktúry údajov, Alfa Bratislava, 1989

Language of instruction:
Slovak language

Notes:

Course evaluation:
Assessed students in total: 4

A	B	C	D	E	FX
75.0	0.0	25.0	0.0	0.0	0.0

Name of lecturer(s): RNDr. Štefan Tkačik, PhD.

Last modification: 14.07.2022

Supervisor(s):
Guarantor:
doc. Ing. Igor Černák, PhD.
Person responsible for the delivery, development and quality of the study programme:
doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KIN/In-BD104A/22	**Course title:** Internet of Things
Type and range of planned learning activities and teaching methods: **Form of instruction:** Lecture / Seminar **Recommended study range:** **hours weekly:** 1 / 1 **hours per semester:** 13 / 13 **Teaching method:** on-site	
Credits: 3	**Working load:** 75 hours
Recommended semester/trimester: 3.	
Level of study: I.	
Prerequisities:	
Requirements for passing the course: The student must master the theoretical knowledge of the subject and also prepare and defend a practical final thesis. Fulfillment of both conditions is demonstrated in the form of a final exam. Final assessment: total percentage gain from mastering theoretical knowledge (50%) and practical final work (50%).	
Learning outcomes of the course: - The student will be able to define the Internet of Things and the devices used. - Gain knowledge and practical experience with the basic possibilities of using and communicating Internet of Things devices in various areas of our lives. - Understands and manages basic issues of security, programming and software updates of microcontrollers and single-board computers, use of sensors, databases and online services. - He will deepen his digital competences required on the labor market.	
Course contents: 1. Definition, basic terms and areas of use of the Internet of Things (IV) 2. Microprocessor, microcontroller, microcomputer, single-board computer 3. Supply of IV devices, "Low Power" mode 4. Sensors and communication (wired, WiFi, Bluetooth, radio, GSM, NFC, RFID...) 5. Communication protocols and services (HTTP, HTTPS, WEB API, MQTT, Zigbee, IFTTT ...) 6. Microcontroller programming (Mikropython, C++ Arduino IDE) 7. Programming single-board computers (Python) 8. Visual programming (Node-Red ...) 9. Databases, collection and presentation of data 10. Real-time clocks and their network synchronization 11. Wireless OTA software update 12. Security of IV devices, LAN and WAN networks (company and home networks, LoRaWAN, Sigfox, NBIoT ...)	
Recommended or required literature: PILLÁR, J. 2021. https://moodle.pf.ku.sk/ - electronic support for the subject. Specialized web portal of the KEGA Internet of Things project: https://UNIoT.sk JAKAB, F. et al. 2020. Internet of Things. TU, Košice, 2020. ISBN: 978-80-553-3680-0.	

Language of instruction:

Notes:

Course evaluation:
Assessed students in total: 2

A	B	C	D	E	FX
50.0	50.0	0.0	0.0	0.0	0.0

Name of lecturer(s): doc. Ing. Ján Pillár, PhD.

Last modification: 10.07.2022

Supervisor(s):
Guarantor:
doc. Ing. Igor Černák, PhD.
Person responsible for the delivery, development and quality of the study programme:
doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KIN/In-BD105B/22	**Course title:** Internet of Things applications 1
Type and range of planned learning activities and teaching methods: **Form of instruction:** Lecture / Seminar **Recommended study range:** **hours weekly:** 1 / 1 **hours per semester:** 13 / 13 **Teaching method:** on-site	
Credits: 2	**Working load:** 50 hours
Recommended semester/trimester: 3.	
Level of study: I.	
Prerequisities:	
Requirements for passing the course: The student must master the theoretical knowledge of the subject and also prepare and defend a practical final thesis. Fulfillment of both conditions is demonstrated in the form of a final exam. Final assessment: total percentage gain from mastering theoretical knowledge (50%) and practical final work (50%).	
Learning outcomes of the course: - The student will gain knowledge and practical experience with the basic possibilities of using and communicating microcontrollers in the Internet of Things environment and in various areas of our lives. - Understands and manages the basic issues of security of their use, programming and software updates, use of sensors, databases and their mutual interaction. - He will deepen his digital competences required on the labor market.	
Course contents: 1. Analysis of the problem area 2. Naming the issue 3. Analysis of the problem 4. Proposal of possible ways to solve the problem 5. Choosing the optimal solution 6. Design of hardware and software security 7. UI/UX design 8. Development and programming of the prototype 9. Debugging and Testing 10. Proposal of the final solution 11. CD/CI 12. Sustainability of the project	
Recommended or required literature: PILLÁR, J. 2021. https://moodle.pf.ku.sk/ - electronic support for the subject. Specialized web portal of the KEGA Internet of Things project: https://UNIoT.sk JAKAB, F. et al. 2020. Internet of Things. TU, Košice, 2020. ISBN: 978-80-553-3680-0.	

Language of instruction:

Notes:

Course evaluation:
Assessed students in total: 2

A	B	C	D	E	FX
50.0	50.0	0.0	0.0	0.0	0.0

Name of lecturer(s): doc. Ing. Ján Pillár, PhD.

Last modification: 10.07.2022

Supervisor(s):

Guarantor:
doc. Ing. Igor Černák, PhD.

Person responsible for the delivery, development and quality of the study programme:
doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KIN/In-BD107B/22	**Course title:** Internet of Things applications 2
Type and range of planned learning activities and teaching methods: **Form of instruction:** Seminar **Recommended study range:** **hours weekly:** 1 **hours per semester:** 13 **Teaching method:** on-site	
Credits: 2	**Working load:** 50 hours
Recommended semester/trimester: 4.	
Level of study: I.	
Prerequisities:	
Requirements for passing the course: The student must master the theoretical knowledge of the subject and also prepare and defend a practical final thesis. Fulfillment of both conditions is demonstrated in the form of a final exam. Final assessment: total percentage gain from mastering theoretical knowledge (50%) and practical final work (50%).	
Learning outcomes of the course: - The student will gain knowledge and practical experience with the basic possibilities of using and communicating with single-board computers in the Internet of Things environment and in various areas of our lives. - Understands and manages the basic issues of security of their use, programming and software updates, use of sensors, databases and their mutual interaction. - He will deepen his digital competences required on the labor market.	
Course contents: 1. Analysis of the problem area 2. Naming the issue 3. Analysis of the problem 4. Proposal of possible ways to solve the problem 5. Choosing the optimal solution 6. Design of hardware and software security 7. UI/UX design 8. Development and programming of the prototype 9. Debugging and Testing 10. Proposal of the final solution 11. CD/CI 12. Sustainability of the project	
Recommended or required literature: PILLÁR, J. 2021. https://moodle.pf.ku.sk/ - electronic support for the subject. Specialized web portal of the KEGA Internet of Things project: https://UNIoT.sk JAKAB, F. et al. 2020. Internet of Things. TU, Košice, 2020. ISBN: 978-80-553-3680-0.	

Language of instruction:

Notes:

Course evaluation:
Assessed students in total: 2

A	B	C	D	E	FX
0.0	100.0	0.0	0.0	0.0	0.0

Name of lecturer(s): doc. Ing. Ján Pillár, PhD.

Last modification: 23.08.2022

Supervisor(s):
Guarantor:
doc. Ing. Igor Černák, PhD.
Person responsible for the delivery, development and quality of the study programme:
doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KIN/In-BD108B/22	**Course title:** Internet of Things applications 3
Type and range of planned learning activities and teaching methods: **Form of instruction:** Lecture / Seminar **Recommended study range:** **hours weekly:** 1 / 1 **hours per semester:** 13 / 13 **Teaching method:** on-site	
Credits: 2	**Working load:** 50 hours
Recommended semester/trimester: 5.	
Level of study: I.	
Prerequisities:	
Requirements for passing the course: The student must master the theoretical knowledge of the subject and also prepare and defend a practical final thesis. Fulfillment of both conditions is demonstrated in the form of a final exam. Final assessment: total percentage gain from mastering theoretical knowledge (50%) and practical final work (50%).	
Learning outcomes of the course: - The student will gain knowledge and practical experience with the basic possibilities of using and communicating microcontrollers and single-board computers in the Internet of Things environment and in various areas of our lives. - Understands and manages the basic issues of security of their use, programming and software updates, use of sensors, databases and their mutual interaction. - He will deepen his digital competences required on the labor market.	
Course contents: 1. Analysis of the problem area 2. Naming the issue 3. Analysis of the problem 4. Proposal of possible ways to solve the problem 5. Choosing the optimal solution 6. Design of hardware and software security 7. UI/UX design 8. Development and programming of the prototype 9. Debugging and Testing 10. Proposal of the final solution 11. CD/CI 12. Sustainability of the project	
Recommended or required literature: PILLÁR, J. 2021. https://moodle.pf.ku.sk/ - electronic support for the subject. Specialized web portal of the KEGA Internet of Things project: https://UNIoT.sk JAKAB, F. et al. 2020. Internet of Things. TU, Košice, 2020. ISBN: 978-80-553-3680-0.	

Language of instruction:

Notes:

Course evaluation:
Assessed students in total: 0

A	B	C	D	E	FX
0.0	0.0	0.0	0.0	0.0	0.0

Name of lecturer(s): doc. Ing. Ján Pillár, PhD.

Last modification: 10.07.2022

Supervisor(s):
Guarantor:
doc. Ing. Igor Černák, PhD.
Person responsible for the delivery, development and quality of the study programme:
doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KIN/In-BD113A/22	**Course title:** Introductory Auditory Pedagogical Practice (Informatics)
Type and range of planned learning activities and teaching methods: **Form of instruction:** Seminar **Recommended study range:** **hours weekly:** 1 **hours per semester:** 13 **Teaching method:** on-site	
Credits: 2	**Working load:** 50 hours
Recommended semester/trimester: 5.	
Level of study: I.	
Prerequisities:	

Requirements for passing the course:

During the semester, students, based on the instructions of the pedagogical practice methodology of the department of informatics and in cooperation with the informatics teacher of the practice school, take part in group listening sessions at the informatics classes at the practice school in the number of hours determined by the faculty, they pass the analyzes of these lessons with the practice teacher, and they keep all records and documents on an ongoing basis to the pedagogical journal.
Final assessment based on the student's portfolio of written materials from pedagogical practice submitted to the methodology of pedagogical practice of the Department of Informatics: evaluation proposal from the trainee teacher, the quality of the submitted pedagogical diary and the student's practice report.
Subject evaluation:
A – 100%-93%
B – 92%-85%
C – 84%-77%
D – 76%-69%
E – 68%-60%
Fx – 59%- 0%

Learning outcomes of the course:

Objective of the subject: Successfully complete a listening group pedagogical practice in computer science at a selected school of regional education (2nd grade of elementary school or secondary school) in coordination with the practice methodology and under the guidance of a practice teacher. To teach students to observe and analyze computer science lessons, to write down pedagogical and psychological aspects of the educational process in hospital records and pedagogical diaries.
Learning outcomes:
After completing the subject, the student will acquire the following knowledge, skills and competences:
- can analyze computer science lessons with the application of theoretical knowledge from the subjects of general didactics and the subjects of pedagogical and psychological disciplines,
- is able to make a clinical record during the lesson and write down a record of the analysis of the lesson with the trainee teacher,
- can communicate adequately in the training school environment,

- can process documentation about his work at the training school.

Course contents:
Pedagogical practice takes place in training schools, it takes the form of pedagogical and psychological observations. The students observe the work of the teacher in the lesson, the work with the subject matter, the choice of methods and means, as well as the level of management of the students' learning activities. During the observation, the students also notice the way of evaluating student performances. In cooperation with the training teacher, they will prepare and teach the specified number of lessons. The trainee teacher signs each student's participation in the pedagogical diary. Acquiring methodological skills in the classroom. Students acquire methodological skills in the computer science classroom: they observe the work of the teacher in the classroom, work with the subject matter, the selection of methods and resources, the level of management of the students' learning activity, the method of evaluating student performance. The student keeps a pedagogic diary during practice: he makes a hospital record with pedagogical and psychological aspects of the educational process (theme, goal, content, methods of the teaching process, ...) and makes a record of the analysis for each lesson. The student consults the documentation for practice with the department's methodology.

Recommended or required literature:
Jacková, J.: Pedagogická prax INFORMATIKA (PedPraxINF), študijná elektronická podpora https://moodle.pf.ku.sk/course/view.php?id=119
Kalhous, O. a kol.: Školní didaktika, Portál 2009, ISBN 978-80-7367-571-4

Language of instruction:
Slovak

Notes:

Course evaluation:
Assessed students in total: 5

A	B	C	D	E	FX
80.0	0.0	0.0	0.0	0.0	20.0

Name of lecturer(s): Ing. Jana Jacková, PhD.

Last modification: 06.12.2022

Supervisor(s):
Guarantor:
doc. Ing. Igor Černák, PhD.
Person responsible for the delivery, development and quality of the study programme:
doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KIN/In-BD100B/22	**Course title:** Mathematics 1
Type and range of planned learning activities and teaching methods: **Form of instruction:** Lecture **Recommended study range:** **hours weekly:** 1 **hours per semester:** 13 **Teaching method:** on-site	
Credits: 2	**Working load:** 50 hours
Recommended semester/trimester: 1.	
Level of study: I.	
Prerequisities:	

Requirements for passing the course:
A student can continuously get 100 points from two papers where he solves tasks from the given topics. The maximum number of points that can be obtained from the exam is 100. The minimum number of points obtained for a satisfactory evaluation
the student's knowledge is 60.
Subject evaluation:
A – 100%-93%
B – 92%-85%
C – 84%-77%
D – 76%-69%
E – 68%-60%
Fx – 59%- 0%

Learning outcomes of the course:
Objective of the subject: The objective of the subject is to acquaint students with the basics of propositional logic, modifying mathematical expressions, and solving equations and inequalities. Furthermore, students will become familiar with the basic properties of the function of one real variable, the investigation of the course of the function, basic elementary functions, and about sequences and series.
Learning outcomes:
After completing the subject, the student will acquire the following knowledge, skills and competences:
- knowledge and experience needed to build mathematical models
- knowledge that will enable students to analyze and solve the given task
- knowledge and experience necessary for choosing appropriate mathematical tools for solving tasks

Course contents:
1. Basic concepts of mathematical logic
2. Semantics of propositional logic
3. Numerical sets and their properties
4. Properties of real numbers
5. Modifications of mathematical expressions

6. Solving equations and inequalities
7. Real function of a real variable
8. Basic features of the function
9. Elementary functions
10. Investigating the properties of functions
11. Sequences and their properties

Recommended or required literature:

1. KLUVÁNEK I. : Prípravný kurz k diferenciálnemu a integrálnemu počtu, PF KU, Ružomberok 2006, ISBN 80-8084-069-5.
2. BUDINSKÁ, B., CHARVÁT, J: Matematika I., Praha, SNTL/ALFA, 1987.
3. ELIÁŠ, J., HORVÁTH, J., KAJAN, J.: Zbierka úloh z vyššej matematiky 1, Bratislava, Alfa, 1986.
4. ŠULKA, R. a kol.: Matematická analýza 1, Bratislava, Alfa, 1986
5. BUŠA J., SCHRÖTTER Š.: Stredoškolská matematika pre študentov FEI TU v Košiciach, Technická univerzita, Košice, 2015. ISBN 978-80-553-2193-6.
6. Z. VOŠICKÝ: Matematika v kocke pre stredné školy, ART AREA, 2001

Language of instruction:
Slovak language

Notes:

Course evaluation:
Assessed students in total: 3

A	B	C	D	E	FX
0.0	0.0	0.0	33.33	33.33	33.33

Name of lecturer(s): RNDr. Štefan Tkačik, PhD.

Last modification: 14.07.2022

Supervisor(s):
Guarantor:
doc. Ing. Igor Černák, PhD.
Person responsible for the delivery, development and quality of the study programme:
doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KIN/In-BD103B/22	**Course title:** Mathematics 2
Type and range of planned learning activities and teaching methods: **Form of instruction:** Seminar **Recommended study range:** **hours weekly:** 1 **hours per semester:** 13 **Teaching method:** on-site	
Credits: 2	**Working load:** 50 hours
Recommended semester/trimester: 2.	
Level of study: I.	
Prerequisities:	
Requirements for passing the course: A student can get 100 points from two papers where he solves tasks from the given topics. The maximum number of points that can be obtained from the exam is 100. The minimum number of points obtained for a satisfactory assessment of the student's knowledge is 60. Subject evaluation A – 100%-93% B – 92%-85% C – 84%-77% D – 76%-69% E – 68%-60% Fx – 59%- 0%	
Learning outcomes of the course: Objective of the subject: The objective of the subject is to teach students to master the basics of matrix calculus, to solve systems of linear equations using the Gaussian elimination method and matrix equations using the inverse matrix. To learn the methods of calculating determinants and their use in solving systems of linear equations. Learning outcomes: After completing the subject, the student will acquire the following knowledge, skills and competences: - knowledge and experience needed to compile mathematical models - systems of equations - knowledge that will enable students to analyze and solve given tasks in the area of solving systems of linear equations - knowledge and skills necessary for the selection of suitable mathematical tools for solving tasks in the area of solving systems of linear equations	
Course contents: 1. Matrices and operations with matrices 2. The rank of the matrix 3. Determinant and its properties 4. Inverse matrix, solving matrix equations 5. Systems of linear equations:	

6. Gauss elimination method
7. Cramer's rule
8. Homogeneous system of linear equations.
9. Numerical methods of solving linear equations

Recommended or required literature:

1. CHVÁL, V. – MIKOLA, M: Lineárna algebra , Katolícka univerzita Ružomberok 2001
2. BUDINSKÝ, B. – CHARVÁT, J.: Matematika 1,SNTL/ALFA Praha 1987
3. KLUVÁNEK, I. – MIŠÍK, L. – ŠVEC, M.: Matematika 1, SNTL Bratislava
http://people.tuke.sk/monika.molnarova/index_soubory/ULAprednasky.pdf
http://people.tuke.sk/monika.molnarova/index_soubory/UvoddoLinearnejAlgebry.pdf http://thales.doa.fmph.uniba.sk/zlatos/la/LAG_A4.pdf

Language of instruction:
Slovak language

Notes:

Course evaluation:
Assessed students in total: 3

A	B	C	D	E	FX
0.0	0.0	0.0	0.0	66.67	33.33

Name of lecturer(s): RNDr. Štefan Tkačik, PhD.

Last modification: 14.07.2022

Supervisor(s):
Guarantor:
doc. Ing. Igor Černák, PhD.
Person responsible for the delivery, development and quality of the study programme:
doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KIN/In-BD102C/22	**Course title:** Mathematics 3
Type and range of planned learning activities and teaching methods: **Form of instruction:** Seminar **Recommended study range:** **hours weekly:** 1 **hours per semester:** 13 **Teaching method:** on-site	
Credits: 2	**Working load:** 50 hours
Recommended semester/trimester: 3.	
Level of study: I.	
Prerequisities:	
Requirements for passing the course: A student can get 60 points from two papers where he solves tasks from the given topics and 40 points from a semester's work in the scope of the curriculum covered during the semester with an application to informatics. The maximum number of points that can be obtained from the exam is 100. The minimum number of points obtained for a satisfactory assessment of the student's knowledge is 60.	
Learning outcomes of the course: The aim of the subject is to teach students to master the basics of differential calculus, to know the meaning of the derivative and especially its application in practice. To learn the methods of calculating the derivative of a function and their use in solving application tasks. After completing the subject, the student will acquire the following knowledge, skills and competences: - knowledge regarding the differentiability of the function and the resulting properties - knowledge and experience needed to build mathematical models - applications of derivation - skills that will enable students to analyze and solve given tasks in the area of differentiable calculus	
Course contents: 1. Basic concepts of differential calculus, differentiability, derivation 2. Calculation with differential functions, derivatives of the kth order. 3. Basic properties of differentiable functions. 4. Applications of the derivative of a function - tangent at a given point 5. Applications of the derivative of a function - extrema of a function and monotonicity 6. Applications of the derivative of a function - concavity, convexity and the course of a function. 7. Differential of a function, applications of differential calculus, 8. Numerical methods for calculating the derivative and numerical search for roots 9. Development of a function into a Taylor polynomial	
Recommended or required literature:	
Language of instruction:	
Notes:	

Course evaluation:
Assessed students in total: 0

A	B	C	D	E	FX
0.0	0.0	0.0	0.0	0.0	0.0

Name of lecturer(s): RNDr. Štefan Tkačik, PhD.

Last modification: 25.08.2022

Supervisor(s):

Guarantor:

doc. Ing. Igor Černák, PhD.

Person responsible for the delivery, development and quality of the study programme:

doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KIN/In-BD103C/22	**Course title:** Mathematics 4
Type and range of planned learning activities and teaching methods: **Form of instruction:** Seminar **Recommended study range:** **hours weekly:** 1 **hours per semester:** 13 **Teaching method:** on-site	
Credits: 1	**Working load:** 25 hours
Recommended semester/trimester: 4.	
Level of study: I.	
Prerequisities:	
Requirements for passing the course: A student can get 60 points from two papers where he solves tasks from the given topics and 40 points from a semester's work in the scope of the curriculum covered during the semester with an application to informatics. The maximum number of points that can be obtained from the exam is 100. The minimum number of points obtained for a satisfactory evaluation the student's knowledge is 60.	
Learning outcomes of the course: Objective of the subject: The objective of the subject is to teach students to master the basics of integral calculus, to know the meaning of the integral and especially its application in practice. To learn the methods of calculating the integral of a function and their use in solving application tasks, for calculating the content, volume, and surface of given rotating bodies. Learning outcomes: After completing the subject, the student will acquire the following knowledge, skills and competences: - knowledge about the integral of the function on the given interval and the properties that result from it - knowledge and experience needed to build mathematical models - applications of the integral - skills that will enable students to analyze and solve given problems in the field of integral calculus	
Course contents: 1. Indefinite integral, basic properties of indefinite integral; 2. The per-partes method in searching for a primitive function; 3. Substitution method in the search for a primitive function; 4. Search for the primitive function of the selected functions; 5. Definition of Riemann's definite integral, basic properties of a definite integral; 6. Calculation of a definite integral, Newton-Leibnitz formula; 7. Area content of planar structures, length of a planar curve, volume of a rotating body, and calculation of the size of the surface of rotating bodies; 8. Numerical calculation of a definite integral: rectangular and trapezoidal method, Simpson's method; 9. Improper integral.	

Recommended or required literature:

Language of instruction:

Notes:

Course evaluation:
Assessed students in total: 0

A	B	C	D	E	FX
0.0	0.0	0.0	0.0	0.0	0.0

Name of lecturer(s): RNDr. Štefan Tkačik, PhD.

Last modification: 25.08.2022

Supervisor(s):

Guarantor:
doc. Ing. Igor Černák, PhD.

Person responsible for the delivery, development and quality of the study programme:
doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KIN/In-BD108A/22	**Course title:** Optical Communication and Information Systems 1
Type and range of planned learning activities and teaching methods: **Form of instruction:** Lecture **Recommended study range:** **hours weekly:** 2 **hours per semester:** 26 **Teaching method:** on-site	
Credits: 3	**Working load:** 75 hours
Recommended semester/trimester: 4.	
Level of study: I.	
Prerequisities:	
Requirements for passing the course: Conditions for completing the course: 3 written tests during the semester. Subject evaluation: A – 100%-93.3% B – 90%-86.7% C – 83.3%-76.7% D – 73.3%-66.7% E – 63.3%-53.3% Fx – 50%- 0%	
Learning outcomes of the course: The aim of the subject: to acquaint students with optocommunication information systems as a perspective transmission environment in informatics, basic elements of an optocommunication information tract, light propagation conditions, optical waveguides, light conduction in optical fibers, semiconductor sources and detectors of optical radiation, light modulation, multiplexers with wave division , transmission characteristics of optical fibers and theoretical possibilities of their measurement, define the issue of integrated optics and OTDR methods - as theoretical preparation for laboratory exercises	
Course contents: 1. The emergence of optical communications. 2. Basic articles of the optocommunication information tract. 3. Conditions of light propagation. Optical waveguides. 4. Conduction of light in optical fibers. 5. Connecting optical fibers. 6. Semiconductor sources of optical radiation, Detection of optical radiation. 7. Light modulations. Multiplexers with wave division. 8. Integrated optics, Transmission characteristics of optical fibers. 9. Measurement by the OTDR method.	

Recommended or required literature:

1. ČERNÁK, I. - JENČO, M. - KÚTNA, A.: Optokomunikačné informačné systémy, (Skriptá), Pedagogická fakulta Katolíckej univerzity v Ružomberku, ISBN 80-8084-022-9, Ružomberok 2005.
2. ČERNÁK, I. – JENČO, M: Telekomunikačné siete IV. (Optokomunikačné systémy) skriptá ISBN 80-8040-137-3 Liptovský Mikuláš, 2000.
3. TURAN, J.: Optoelektronika. Bratislava, Alfa 1989.
4. ZIEGLER, M.: Optické technológie nás přivádejí do epochy internetu. Telekomunikace, roč. 37,č.6, 2000, s.3-7. ISSN 0040-2591
5. ČERNÁK, I.: Študijná elektronická podpora pre výučbu predmetu Optokomunikačné informačné systémy, moodle.pf.ku.sk

Language of instruction:

Notes:

Course evaluation:

Assessed students in total: 2

A	B	C	D	E	FX
0.0	50.0	50.0	0.0	0.0	0.0

Name of lecturer(s): doc. Ing. Igor Černák, PhD.

Last modification: 31.08.2022

Supervisor(s):

Guarantor:

doc. Ing. Igor Černák, PhD.

Person responsible for the delivery, development and quality of the study programme:

doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KIN/In-BD110A/22	**Course title:** Optical Communication and Information Systems 2
Type and range of planned learning activities and teaching methods: **Form of instruction:** Seminar **Recommended study range:** **hours weekly:** 2 **hours per semester:** 26 **Teaching method:** on-site	
Credits: 3	**Working load:** 75 hours
Recommended semester/trimester: 5.	
Level of study: I.	
Prerequisities:	
Requirements for passing the course: Prerequisite subjects: : Optocommunication and information systems 1 Completion of all prescribed laboratory measurements. Subject evaluation: Based on the evaluation of protocols from laboratory measurements.	
Learning outcomes of the course: The aim of the subject: to acquaint students with optocommunication information systems as a prospective transmission environment in computer science, software and direct measurements of the basic characteristics of optical fibers using various methods, the possibilities of connecting optical fibers, measurements in the network, to clarify the procedures for breaking and welding of optical fibers, to compile the basic transmission characteristics of optical fibers, to demonstrate important measurements in an optical network.	
Course contents: 1. Training - safety when working in the laboratory, fire protection. 2. Basics of optoelectronics 3. Measurement of characteristics of optical sources and detectors. 4. Software measurements of the characteristics of optical paths in the OTDR environment. 5. Software measurements of characteristics of optical paths and differences in the OTDR environment. 6. Direct measurements of optical paths by the method of inserted losses and the method of 2 lengths. 7. Possibilities of connecting optical fibers with practical teaching of fiber preparation and welding. 8. OTDR measurement of optical paths using a reflectometer. 9. Sample of different types of optical cables and other passive and active elements of the optical network. 10. Measuring the attenuation of attenuators, determining the influence of the bending radius of the fiber on its attenuation, measuring the characteristics of OV when using different wavelengths of the radiation source. 11. Mathematical calculations of OV attenuation, numerical aperture, chromatic dispersion, OV attenuation.	

12. Evaluation of measurement protocols, corrective measurements, verification of theoretical knowledge.

Recommended or required literature:

1. ČERNÁK, I. - JENČO, M. - KÚTNA, A.: Optokomunikačné informačné systémy, (Skriptá), Pedagogická fakulta Katolíckej univerzity v Ružomberku, ISBN 80-8084-022-9, Ružomberok 2005.
2. ČERNÁK, I. – JENČO, M: Telekomunikačné siete IV. (Optokomunikačné systémy) skriptá ISBN 80-8040-137-3 Liptovský Mikuláš, 2000.
3. TURAN, J.: Optoelektronika. Bratislava, Alfa 1989.
4. ZIEGLER, M.: Optické technológie nás přivádejí do epochy internetu. Telekomunikace, roč. 37, č.6, 2000, s.3-7. ISSN 0040-2591
5. VAŠINEK, V. – Optoelektronika 2, (Skriptá), Fakulta elektrotechniky a informatiky, VŠB-TU Ostrava
6. ČERNÁK, I.: Študijná elektronická podpora pre výučbu predmetuOptokomunikačnéinformačné systémy, moodle.pf.ku.sk

Language of instruction:

Notes:

Course evaluation:

Assessed students in total: 5

A	B	C	D	E	FX
100.0	0.0	0.0	0.0	0.0	0.0

Name of lecturer(s): doc. Ing. Igor Černák, PhD.

Last modification: 31.08.2022

Supervisor(s):

Guarantor:

doc. Ing. Igor Černák, PhD.

Person responsible for the delivery, development and quality of the study programme:

doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KIN/In-BD102A/22	**Course title:** Principles of Computers and Operating Systems 1
Type and range of planned learning activities and teaching methods: **Form of instruction:** Lecture / Seminar **Recommended study range:** **hours weekly:** 2 / 1 **hours per semester:** 26 / 13 **Teaching method:** on-site	
Credits: 3	**Working load:** 75 hours
Recommended semester/trimester: 2.	
Level of study: I.	
Prerequisities:	
Requirements for passing the course: Continuous assessment: Continuous practical tasks during the semester (30%). Final assessment: Final test at the end of the semester (70%). Subject evaluation: A – 100%-93% B – 92%-85% C – 84%-77% D – 76%-69% E – 68%-60% Fx – 59%- 0%	
Learning outcomes of the course: Objective of the subject: To acquaint the student with basic concepts and approaches in the design of functional elements and units of digital computers. Learning outcomes (knowledge, skills and competences): - The student will know the principles on which digital computers are based - He will be able to practically connect and simulate various logic circuits, sequential circuits, adder, bit comparator, shift register, binary cell and arithmetic-logic processor unit. Verification of the level of acquired knowledge, skills and competences: Verification of the degree of acquisition of the relevant knowledge, skills and competencies of the student is carried out on the basis of theoretical and practical examinations during and at the end of the semester teaching of the subject.	
Course contents: 1. History of computer systems, individual generations of computers and their characteristics. 2. Coding and operations in the binary system. Binary number system. Conversion of number systems, Arithmetic operations in the binary number system. Codes for negative numbers, direct, inverse and complementary code. 3. Basic logic gates and their simulation through switches, transistors and integrated circuits. Half and full adder. Bit comparator. 4. Sequential circuits, registers and computer memories. Memory sharing.	

5. Binary memory cell.
6. Shift register.
7. Arithmetic-logical unit. Controller.
8. Processor, micro-instruction register, machine cycle.

Recommended or required literature:

1. DIRGOVÁ LUPTÁKOVÁ, I; KVASNIČKA, V.: Introduction to logic for computer scientists. Trnava: University of St. Cyril and Methodius in Trnva, Faculty of Natural Sciences, Department of Applied Informatics and Mathematics, 2017, 1st edition, 217 pp., ISBN: 978-80-8105-888-2.
2. BERNARD, JM: From logic circuit to microprocessor. Prague: SNTL, 1986, 1st ed., 688 p.
3. PETŘIK, J.; RAUNER, K.: Electronics: (digital part). Pilsen: University of West Bohemia, 2001, 105 pp., ISBN: 80-7082-776-9.
4. KOČIŠ, I.: Microprocessors and microcomputers. Bratislava: Alfa, 1986, 472 p.
5. MINASI, M.: IBM PC - Big hardware guide. Grada, Prague 2002, 763 pp., ISBN: 80-247-0273-8.
6. ROJČEK, M.: electronic study support for teaching the subject Principles of computers and operating systems 1, available online at: https://moodle.pf.ku.sk

Language of instruction:
Slovak language

Notes:

Course evaluation:
Assessed students in total: 6

A	B	C	D	E	FX
16.67	0.0	33.33	50.0	0.0	0.0

Name of lecturer(s): PaedDr. Michal Rojček, PhD.

Last modification: 01.08.2022

Supervisor(s):
Guarantor:
doc. Ing. Igor Černák, PhD.
Person responsible for the delivery, development and quality of the study programme:
doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KIN/In-BD106A/22	**Course title:** Principles of Computers and Operating Systems 2
Type and range of planned learning activities and teaching methods: **Form of instruction:** Lecture / Seminar **Recommended study range:** **hours weekly:** 1 / 2 **hours per semester:** 13 / 26 **Teaching method:** on-site	
Credits: 3	**Working load:** 75 hours
Recommended semester/trimester: 3.	
Level of study: I.	
Prerequisities:	
Requirements for passing the course: Continuous assessment: Continuous practical tasks during the semester (30%). Final assessment: Final test at the end of the semester (70%). Subject evaluation: A – 100%-93% B – 92%-85% C – 84%-77% D – 76%-69% E – 68%-60% Fx – 59%- 0%	
Learning outcomes of the course: Objective of the subject: The aim of the subject is to acquaint students with the principles of operating systems, their structure and functions, historical overview, OS development, structure, system services, calls, processes, threads, memory management, file management, disk device management, define work in the GNU/ Linux OS terminal , working with files, working with directories, process processing and text editor vi. Learning outcomes (knowledge, skills and competences): - The student will know the principles on which modern operating systems are based - Will be able to work in the terminal of the GNU/Linux operating system. Verification of the level of acquired knowledge, skills and competences: Verification of the degree of acquisition of the relevant knowledge, skills and competencies of the student is carried out on the basis of theoretical and practical examinations during and at the end of the semester teaching of the subject.	
Course contents: 1. Structure and function of a computer in information processing, operating system. 2. Types of operating systems - OS for 1st and 2nd generation computers, OS for 3rd generation computers - batch, spooling, multiprogram, time allocation systems. 3. Parallel and distributed OS of the 4th and 5th generation, OS of personal computers. 4. Structures of operating systems - simple, monolithic, multi-layered, object-oriented.	

5. Structures of real-time operating systems, client-server structure, virtual computer.
6. OS components and functions – layers, system calls, services and functions.
7. Process, process states, process implementation, process control block.
8. Operations with processes, process switching.
9. Thread, thread states, implementation and thread switching.
10. Process planning, planning criteria and algorithms.
11. Collaborative processes, process communication, communication algorithms.
12. Process synchronization, semaphore principle, synchronization algorithms.
13. Process deadlock, resource allocation chart.
14. Memory management
15. OS Linux, history, distributions, system organization, basic commands and system management.

Recommended or required literature:

1. MARTINCOVÁ, P.: Operating systems, University of Žilina, Faculty of Management and Informatics, 1997.
2. MADNICK, SE – DONOVAN, JJ: Operating systems, SNTL Prague 1981.
3. KROKAVEC, M.: Operating systems, ALFA 1988.
4. RICHTER, J.: Windows for advanced and experts, Computer Press, 1997
5. CENEK, P.: Operating systems, ALFA 1989.
6. ČADA, D.: Operační systémy, GRADA 1994
7. TOVARDS, L.: Linux documentation project, Computer Press, 1998
8. ROJČEK, M.: Study electronic support for subject teaching
Principles of computers and operating systems 2, available online at: https://moodle.pf.ku.sk
9. Handbooks and manuals for operating systems Linux Debian, Linux Ubuntu.

Language of instruction:
Slovak language

Notes:

Course evaluation:
Assessed students in total: 1

A	B	C	D	E	FX
0.0	0.0	0.0	100.0	0.0	0.0

Name of lecturer(s): PaedDr. Michal Rojček, PhD.

Last modification: 01.08.2022

Supervisor(s):
Guarantor:
doc. Ing. Igor Černák, PhD.
Person responsible for the delivery, development and quality of the study programme:
doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KIN/In-BD100A/22	**Course title:** Programming 1
Type and range of planned learning activities and teaching methods: **Form of instruction:** Lecture / Seminar **Recommended study range:** **hours weekly:** 2 / 2 **hours per semester:** 26 / 26 **Teaching method:** on-site	
Credits: 4	**Working load:** 100 hours
Recommended semester/trimester: 1.	
Level of study: I.	
Prerequisities:	
Requirements for passing the course: During the semester, the student proves his theoretical knowledge in the fields of programming in the form of written tests. Subsequently, he demonstrates practical skills by solving partial tasks and partial projects (programs). Final assessment: cumulative percentage gain from the written test (30%) and practical skills (70%) acquired during the semester and the semester exam. Subject evaluation: A – 100%-93% B – 92%-85% C – 84%-77% D – 76%-69% E – 68%-60% Fx – 59%- 0%	
Learning outcomes of the course: Objective of the subject: The aim of the course is to provide students with theoretical knowledge of programming with a focus on building and developing algorithmic thinking, as well as practical skills with the Python programming language environment. Learning outcomes (knowledge, skills and competences): - The student will be able to define and explain the basic rules for creating programs, working with data types, basic commands and constructions for creating programs. - Will have basic programming skills. - He will be able to solve problems when working with the Python programming language, create and verify designed algorithms in a specific programming environment. - He will be able to design and compile simple programs for solving practical tasks. Verification of the level of acquired knowledge, skills and competences: The verification is carried out on the basis of theoretical and practical checks during the semester teaching of the subject.	
Course contents: 1. Algorithm, program, programming language.	

2. Creating and writing programs in the Python language, the alphabet of the language.
3. Simple data types.
4. Constants, variables.
5. Expressions, evaluation of expressions.
6. Assignment, branching commands.
7. Cycle commands.
8. Data type string.
9. Structured types – field, record, set.
10. Working with files.
11. Structured programming, functions.
12. Block structure of the program, modularity, libraries.

Recommended or required literature:

RAMALHO, L. 2015. Fluent Python, O' Reilly, e-book, 766 p.
BLAHO, A. 2018. Programming in Python. Bratislava: UK, e-book, 872 p. ISBN 978-80-8147-084-4.
BLAHO, A. 2016. Programming in Python, Bratislava: UK, e-book, 322 p. ISBN 978-80-8147-067-7.
JONES, B.K., BEAZLEY, D. 2019. Python Cookbook, 3rd ed. O'Reilly.
SUMMERFIELD, M. 2013. Python 3 tutorial. Computer Press.
PECINOVSKÝ, R. 2020. Python. Grada.
KUČERA, P. 2016. We program in Python, Martinus, e-book.
www.python.org - Internet resource
JENČO, M. Electronic study support for teaching the subject Programming 1, moodle.pf.ku.sk

Language of instruction:

Notes:

Course evaluation:

Assessed students in total: 6

A	B	C	D	E	FX
16.67	33.33	50.0	0.0	0.0	0.0

Name of lecturer(s): doc. Ing. Michal Jenčo, PhD.

Last modification: 25.07.2022

Supervisor(s):

Guarantor:
doc. Ing. Igor Černák, PhD.

Person responsible for the delivery, development and quality of the study programme:
doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KIN/In-BD102B/22	**Course title:** Programming 2
Type and range of planned learning activities and teaching methods: **Form of instruction:** Seminar **Recommended study range:** **hours weekly:** 1 **hours per semester:** 13 **Teaching method:** on-site	
Credits: 3	**Working load:** 75 hours
Recommended semester/trimester: 2.	
Level of study: I.	
Prerequisities: KIN/In-BD100A/22	
Requirements for passing the course: In the course of the semester, the student will study other resources from the fields of programming. Subsequently, he demonstrates practical skills by solving partial tasks, projects and a semester project. Final assessment: total percentage gain from the partial projects in the exercises (60%) and the semester project (40%) obtained during the project presentation. Subject evaluation: A – 100%-93% B – 92%-85% C – 84%-77% D – 76%-69% E – 68%-60% Fx – 59%- 0%	
Learning outcomes of the course: The aim of the subject is to provide students with additional theoretical knowledge of programming with a focus on building and developing algorithmic thinking, but above all on practical skills with the Python programming language environment. Learning outcomes (knowledge, skills and competences): - The student will be able to apply other rules for creating programs. - Will have programming skills. - He will be able to solve problems when working with the Python programming language, create and verify designed algorithms in a specific programming environment. - He will be able to design and compile programs for solving practical tasks. Verification of the level of acquired knowledge, skills and competences: The verification is carried out on the basis of practical checks during the semester teaching of the subject.	
Course contents: 1. Libraries and packages in Python. 2. Standard libraries. 3. Submission of a semester project.	

4. Exception handling and custom functions.
5. Sorting algorithms.
6. Use of sorting algorithms.
7. Recursion, search with return.
8. Debugging and testing of programs.
9. Linked structures, pointer data type.
10. Dynamic data structures.
11. Basics of object-oriented programming.
12. Presentation of the semester project.

Recommended or required literature:

RAMALHO, L. 2015. Fluent Python, O' Reilly, e-book, 766 p.
BLAHO, A. 2018. Programming in Python. Bratislava: UK, e-book, 872 p. ISBN 978-80-8147-084-4.
BLAHO, A. 2016. Programming in Python, Bratislava: UK, e-book, 322 p. ISBN 978-80-8147-067-7.
JONES, B.K., BEAZLEY, D. 2019. Python Cookbook, 3rd ed. O'Reilly.
SUMMERFIELD, M. 2013. Python 3 tutorial. Computer Press.
PECINOVSKÝ, R. 2020. Python. Grada.
KUČERA, P. 2016. We program in Python, Martinus, e-book.
www.python.org - Internet resource
JENČO, M. Electronic study support for teaching the subject Programming 2, moodle.pf.ku.sk

Language of instruction:

Notes:

Course evaluation:

Assessed students in total: 6

A	B	C	D	E	FX
33.33	33.33	16.67	0.0	0.0	16.67

Name of lecturer(s): doc. Ing. Michal Jenčo, PhD.

Last modification: 26.07.2022

Supervisor(s):

Guarantor:

doc. Ing. Igor Černák, PhD.

Person responsible for the delivery, development and quality of the study programme:

doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KIN/In-BD107A/22	**Course title:** Programming 3
Type and range of planned learning activities and teaching methods: **Form of instruction:** Lecture / Seminar **Recommended study range:** **hours weekly:** 1 / 1 **hours per semester:** 13 / 13 **Teaching method:** on-site	
Credits: 2	**Working load:** 50 hours
Recommended semester/trimester: 4.	
Level of study: I.	
Prerequisities: KIN/In-BD102B/22	
Requirements for passing the course: During the semester, the student proves his theoretical knowledge in the fields of programming in the form of a presentation or written tests. Subsequently, he demonstrates practical skills by solving sub-tasks of sub-projects and smaller semester projects. Final assessment: total percentage gain from the oral presentation of knowledge (20%) and practical skills (80%) acquired during the semester when solving partial projects in exercises, smaller semester projects and in the semester exam. Subject evaluation: A – 100%-93% B – 92%-85% C – 84%-77% D – 76%-69% E – 68%-60% Fx – 59%- 0%	
Learning outcomes of the course: The aim of the subject is to provide students with additional theoretical knowledge of programming with a focus on building and developing algorithmic thinking, as well as better practical skills with the Python programming language environment. Learning outcomes (knowledge, skills and competences): - The student will be able to define and explain the basic rules for creating more complex programs, working with data types, commands and constructions for creating programs, including object-oriented programming (OOP). - Will have better imperative programming skills as well as basic OOP skills. - He will be able to solve problems when working with the Python programming language, create and verify more complex algorithms in a specific programming environment. - He will be able to design and compile more complex programs for solving practical tasks. Verification of the level of acquired knowledge, skills and competences: The verification is carried out on the basis of theoretical and practical checks during the semester teaching of the subject and on the semester exam.	
Course contents:	

1. Introduction, types of programming, options, principles, verification of acquired knowledge.
2. Assignment of program projects solved within the subject.
3. Theoretical foundations of OOP, concepts - object, class, class method, inheritance and polymorphism, encapsulation, abstraction.
4. Classes and class instances - objects. Attributes of classes, attributes of instances.
5. Definition of methods, constructor, destructor, decorator, class methods and static attributes and methods.
6. Heredity. Access to inherited members.
7. Multiple and multi-level inheritance.
8. Rewriting the method associated with inheritance, overloading operators - changing the number of parameters (Overriding, Overloading). Types of operators.
9. Verification of the status of partial projects.
10. Encapsulation, use of bypass, obfuscation of variables.
11. Abstraction, abstract class.
12. Types of polymorphism, specifics of method calls. Parametric polymorphism.

Recommended or required literature:

RAMALHO, L. 2015. Fluent Python, O' Reilly, e-book, 766 p.
BLAHO, A. 2018. Programming in Python. Bratislava: UK, e-book, 872 p. ISBN 978-80-8147-084-4.
BLAHO, A. 2016. Programming in Python, Bratislava: UK, e-book, 322 p. ISBN 978-80-8147-067-7.
JONES, B.K., BEAZLEY, D. 2019. Python Cookbook, 3rd ed. O'Reilly.
SUMMERFIELD, M. 2013. Python 3 tutorial. Computer Press.
PECINOVSKÝ, R. 2020. Python. Grada.
KUČERA, P. 2016. We program in Python, Martinus, e-book.
www.python.org - Internet resource
JENČO, M. Electronic study support for teaching the subject Programming 1, moodle.pf.ku.sk

Language of instruction:

Notes:

Course evaluation:

Assessed students in total: 4

A	B	C	D	E	FX
50.0	0.0	0.0	0.0	0.0	50.0

Name of lecturer(s): doc. Ing. Michal Jenčo, PhD.

Last modification: 26.07.2022

Supervisor(s):

Guarantor:

doc. Ing. Igor Černák, PhD.

Person responsible for the delivery, development and quality of the study programme:

doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok

Faculty: Faculty of Education

Course code: KIN/In-BD112A/22	**Course title:** Programming 4

Type and range of planned learning activities and teaching methods:
Form of instruction: Lecture / Seminar
Recommended study range:
hours weekly: 1 / 1 **hours per semester:** 13 / 13
Teaching method: on-site

Credits: 2	**Working load:** 50 hours

Recommended semester/trimester: 5.

Level of study: I.

Prerequisities:

Requirements for passing the course:

Learning outcomes of the course:

Course contents:

Recommended or required literature:

Language of instruction:

Notes:

Course evaluation:
Assessed students in total: 5

A	B	C	D	E	FX
60.0	0.0	40.0	0.0	0.0	0.0

Name of lecturer(s): PaedDr. Michal Rojček, PhD.

Last modification: 25.02.2022

Supervisor(s):
Guarantor:
doc. Ing. Igor Černák, PhD.
Person responsible for the delivery, development and quality of the study programme:
doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KIN/In-BD101B/22	**Course title:** Programming Practice 1
Type and range of planned learning activities and teaching methods: **Form of instruction:** Seminar **Recommended study range:** **hours weekly:** 1 **hours per semester:** 13 **Teaching method:** on-site	
Credits: 2	**Working load:** 50 hours
Recommended semester/trimester: 1.	
Level of study: I.	
Prerequisities:	
Requirements for passing the course: During the course, students independently prepare assignments for individual exercises. The final evaluation is based on the development of examples from the exercises. Subject evaluation: A – 100%-93% B – 92%-85% C – 84%-77% D – 76%-69% E – 68%-60% Fx – 59%- 0%	
Learning outcomes of the course: The aim of the course is to provide students with practical programming skills in the Python programming language environment. Learning outcomes (knowledge, skills and competences): - The student will have basic programming skills. - He will be able to solve problems when working with the Python programming language, create and verify simple algorithms and programs in a specific programming environment. - He will be able to design and compile simple programs for solving practical tasks. Verification of the level of acquired knowledge, skills and competences: The verification is carried out on the basis of the performance of practical tasks during the semester teaching of the subject.	
Course contents:	
Recommended or required literature:	
Language of instruction:	
Notes:	

Course evaluation:
Assessed students in total: 4

A	B	C	D	E	FX
50.0	50.0	0.0	0.0	0.0	0.0

Name of lecturer(s): doc. Ing. Michal Jenčo, PhD.

Last modification: 26.07.2022

Supervisor(s):

Guarantor:

doc. Ing. Igor Černák, PhD.

Person responsible for the delivery, development and quality of the study programme:

doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KIN/In-BD101C/22	**Course title:** Programming Practice 2
Type and range of planned learning activities and teaching methods: **Form of instruction:** Seminar **Recommended study range:** **hours weekly:** 1 **hours per semester:** 13 **Teaching method:** on-site	
Credits: 2	**Working load:** 50 hours
Recommended semester/trimester: 2.	
Level of study: I.	
Prerequisities:	
Requirements for passing the course: During the course, students independently prepare assignments for individual exercises. The final evaluation is based on the development of examples from the exercises. Subject evaluation: A – 100%-93% B – 92%-85% C – 84%-77% D – 76%-69% E – 68%-60% Fx – 59%- 0%	
Learning outcomes of the course: The aim of the subject is to provide students with more extensive knowledge and practical skills in programming in the environment of the Python programming language. Learning outcomes (knowledge, skills and competences): - The student will have programming skills. - He will be able to solve problems when working with the Python programming language, create and verify algorithms and programs in a specific programming environment. - He will be able to design and compile more complex programs for solving practical tasks. Verification of the level of acquired knowledge, skills and competences: The verification is carried out on the basis of the performance of practical tasks during the semester teaching of the subject.	
Course contents: 1. Libraries and packages in Python. 2. Standard libraries. 3. Creation of the semester project algorithm. 4. Exception handling and custom functions. 5. Sorting algorithms. 6. Use of sorting algorithms. 7. Recursion, search with return. 8. Debugging and testing of programs.	

9. Linked structures, pointer data type.
10. Dynamic data structures.
11. Basics of object-oriented programming.

Recommended or required literature:

RAMALHO, L. 2015. Fluent Python, O' Reilly, e-book, 766 p.
BLAHO, A. 2018. Programming in Python. Bratislava: UK, e-book, 872 p. ISBN 978-80-8147-084-4.
BLAHO, A. 2016. Programming in Python, Bratislava: UK, e-book, 322 p. ISBN 978-80-8147-067-7.
JONES, B.K., BEAZLEY, D. 2019. Python Cookbook, 3rd ed. O'Reilly.
SUMMERFIELD, M. 2013. Python 3 tutorial. Computer Press.
PECINOVSKÝ, R. 2020. Python. Grada.
KUČERA, P. 2016. We program in Python, Martinus, e-book.
www.python.org - Internet resource
JENČO, M. Electronic study support for the teaching of the subject Praktikum z programming 2, moodle.pf.ku.sk

Language of instruction:

Notes:

Course evaluation:
Assessed students in total: 4

A	B	C	D	E	FX
75.0	25.0	0.0	0.0	0.0	0.0

Name of lecturer(s): doc. Ing. Michal Jenčo, PhD.

Last modification: 26.07.2022

Supervisor(s):

Guarantor:
doc. Ing. Igor Černák, PhD.

Person responsible for the delivery, development and quality of the study programme:
doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok

Faculty: Faculty of Education

Course code: KIN/In-BD100S/22	**Course title:** State final exam - Informatics

Type and range of planned learning activities and teaching methods:
Form of instruction:
Recommended study range:
hours weekly: **hours per semester:**
Teaching method: on-site

Credits: 5	**Working load:** 125 hours

Recommended semester/trimester: 5., 6..

Level of study: I.

Prerequisities:

Requirements for passing the course:

Learning outcomes of the course:

Course contents:

Recommended or required literature:

Language of instruction:

Notes:

Course evaluation:
Assessed students in total: 20

A	B	C	D	E	FX
15.0	25.0	20.0	15.0	20.0	5.0

Name of lecturer(s):

Last modification:

Supervisor(s):
Guarantor:
doc. Ing. Igor Černák, PhD.
Person responsible for the delivery, development and quality of the study programme:
doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KIN/In-BD105A/22	**Course title:** Theoretical Basics of Informatics
Type and range of planned learning activities and teaching methods: **Form of instruction:** Lecture / Seminar **Recommended study range:** **hours weekly:** 1 / 1 **hours per semester:** 13 / 13 **Teaching method:** on-site	
Credits: 2	**Working load:** 50 hours
Recommended semester/trimester: 3.	
Level of study: I.	
Prerequisities:	
Requirements for passing the course: Continuous assessment: partial activities of the subject according to the semester assignment (50%). Final assessment: written exam (50%). Subject evaluation: A – 100%-93% B – 92%-85% C – 84%-77% D – 76%-69% E – 68%-60% Fx – 59%- 0%	
Learning outcomes of the course: Objective of the course: To become familiar with the basic terms and methods used in theoretical informatics. Illustrate them with examples. Learning outcomes: After completing the subject, the student will acquire the following knowledge, skills and competences: ~ master the basic concepts from the field of theoretical foundations of computer science, ~ can present the subject matter, ~ can explain procedures using examples.	
Course contents: Abeceda, slovo, jazyk. Množiny a operácie s nimi. Formálne jazyky a operácie s nimi - pojem formálneho jazyka (definícia a príklady), operácie so slovami (dĺžka, podslovo, zreťazenie, zrkadlový obraz), operácie s jazykmi (zjednotenie, prienik, doplnok, zreťazenie, iterácia). Konečné automaty – definícia, konfigurácia, krok výpočtu, výpočet automatu, jazyk akceptovaný konečným automatom, deterministický a nedeterministický konečný automat. Zásobníkový automat.	

Recommended or required literature:

Jacková, J., Majherová, J.: Teoretické základy informatiky (TZInf), študijná elektronická podpora https://moodle.pf.ku.sk/course/view.php?id=116
Králík, V., Majherová, J.: Teoretické základy informatiky 1 : riešené príklady z teórie formálnych jazykov a automatov. Ružomberok: Verbum - vydavateľstvo Katolíckej univerzity v Ružomberku, 2015. ISBN 978-80-561-0312-8.
Bandurič, I., Rakovská, E.: Základy teoretickej informatiky. 3. vyd. Bratislava: Vydavateľstvo EKONÓM, 2012. ISBN 80-225-2004-7.
Vavrečková, Š.: Teorie jazyků a automatů I. Základy teoretické informatiky I. Opava: Slezská univerzita v Opavě, 2016. http://vavreckova.zam.slu.cz/obsahy/tja/skripta1/tja1.pdf
Vavrečková, Š.: Teorie jazyků a automatů I. Sbírka úloh pro cvičení. Opava: Slezská univerzita v Opavě, 2017. http://vavreckova.zam.slu.cz/obsahy/tja/skripta1/teorie_jazyku1_cv.pdf

Language of instruction:
Slovak

Notes:

Course evaluation:
Assessed students in total: 3

A	B	C	D	E	FX
66.67	0.0	0.0	0.0	33.33	0.0

Name of lecturer(s): Ing. Jana Jacková, PhD.

Last modification: 06.12.2022

Supervisor(s):

Guarantor:
doc. Ing. Igor Černák, PhD.

Person responsible for the delivery, development and quality of the study programme:
doc. Ing. Igor Černák, PhD.

COURSE INFORMATION SHEET

University: Catholic University in Ružomberok	
Faculty: Faculty of Education	
Course code: KIN/In-BD104C/22	**Course title:** Web Design 4
Type and range of planned learning activities and teaching methods: **Form of instruction:** Seminar **Recommended study range:** **hours weekly:** 1 **hours per semester:** 13 **Teaching method:** on-site	
Credits: 1	**Working load:** 25 hours
Recommended semester/trimester: 6.	
Level of study: I.	
Prerequisities:	
Requirements for passing the course: The student must be able to work in a team, process and defend a practical cooperative final thesis. Fulfillment of the condition is demonstrated in the form of a final exam. Final assessment: percentage gain from the defense of the practical final thesis (100%).	
Learning outcomes of the course: - The student will know the process of creating a web application in a team for a fictitious organization. - Can handle basic knowledge of analysis, design, development and testing of a web application. - Gain a broader and deeper overview of new promising web technologies and their support, as well as the ability to analyze the perspective of individual web technologies oriented towards commercial practice, work in a team and propose procedures for achieving set goals. - Practically within the team, he will design, program and publish a modern web application using the tools, containerization, or devices and services of the Internet of Things that have been mastered so far.	
Course contents: 1. Proposal for entering a web application of a fictitious organization. 2. Determination of solving teams and division of tasks. 3. Basic analysis of the presentation needs of a fictitious organization. 4. The first system design of the basic prototype of the web application. 5. Proposal of the procedure (timetable) for the implementation of the web application. 6. Specification of specific technologies used for implementation. 7. Gradual development and debugging of the web application. 8. Management of web application content development. 9. Final fine-tuning of design and content from the point of view of UI/UX. 10. Preparation of the defense of the web application by the investigation team. 11. Corrections of the final works of individual teams.	

Recommended or required literature:

PILLÁR, J. 2021. https://moodle.pf.ku.sk/ - electronic support for the subject.
PILLÁR, J. 2017. ASP.NET Core MVC - college textbook. KU, Ružomberok, 2017.
Specialized web portal of the KEGA project: https://UNIoT.sk
Powell, T. A. 2004. Web design-Complete guide, Computer Press, Brno, 2004.
Brian, P.H. 2011. HTML5 and CSS3, Computer Press, Brno, 2011.
Croft, J., Lloyd, I., Rubin, D. 2007. Masters in CSS, Computer Press, Brno, 2007.
ASP.NET Core course online: https://docs.microsoft.com/en-us/aspnet/core/
.NET Core tutorial online: https://docs.microsoft.com/en-us/dotnet/core/tutorials/index
Course RAZOR pages online: https://www.w3schools.com/asp/razor_intro.asp
PHP course online, https://www.w3schools.com/php/
PHP Course Online, http://www.tutorialspoint.com//php/
LACKO, Ľ. 2005. PHP and MySQL - Ready solutions. Computer Press, Brno, 2005.
Bootstrap course online, http://getbootstrap.com
Docker containerization course online: http://www.docker.com

Language of instruction:

Notes:

Course evaluation:

Assessed students in total: 0

A	B	C	D	E	FX
0.0	0.0	0.0	0.0	0.0	0.0

Name of lecturer(s): doc. Ing. Ján Pillár, PhD.

Last modification: 10.07.2022

Supervisor(s):

Guarantor:

doc. Ing. Igor Černák, PhD.

Person responsible for the delivery, development and quality of the study programme:

doc. Ing. Igor Černák, PhD.