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Participating Organization:	UL, FERIT, UBL, UNSA, UNTZ, UB, UNI, UNS, ENT, BICOM, BIT, CISCO, NiCAT, RT-RK, VOICT
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Task	T2.1 Modernization of telecommunications engineering study programmes (within 1st and 2nd cycles) in 3 B&H and 3 Serbian HEIs in cooperation with ICT industry (Task leader: UNITZ). T2.2 Delivery of courses in the modernized and accredited study programmes (Task leads: UNITZ for B&H, UNS for Serbia).	

1. Contents

- 2. Introduction 5
- 3. Modernization of study programs in telecom engineering: list of classes, material, teaching methodology..... 5
- 4. Accrediatation of new and modernized courses..... 6
- 5. Table 1. Teaching methodologies 7
- 6. Table 2a. BENEFIT enhanced and new courses..... 8
- 7. Table 2b. BENEFIT enhanced and new courses..... 12

2. Introduction

This document summarizes the main outcomes of the activities carried out up to date in WP2 and WP3. They have led to the definition of a concrete modernization strategy for the study programs in telecommunication engineering at 6 Western Balkans universities.

3. Modernization of study programs in telecom engineering: list of classes, material, teaching methodology

In WP2, 12 study programs (6 first cycle and 6 second cycle) in telecommunications engineering from 6 participating universities in Serbia and B&H. have been identified to be involved. Each university has defined the courses/classes that will be subject of modernization. This has led to the identification of 64 classes. Modernization refers to either a restructuring of an existing class or development of a completely new one.

For all 64 classes, mapping of a specific knowledge area has been done, and also the description of the class content – (at the current stage) most of them are posted on the e-platform (<https://www.project-benefit.eu/eplatform/?programmes#p1>) and all study programs in Serbia have been accredited in 2019. The teachers of these classes have been already identified. The type of the provided material that will be developed has also been defined. The teachers are responsible to prepare and upload it to the e-platform (<https://www.project-benefit.eu/eplatform/?materials#5>) so that maximum dissemination and exploitation among the project partner universities is possible. Material consists of: books, lectures slides, lab practicum notes, videos. A clear plan for the completion of this task by the end of the project has been made for at least 43 courses according to the project plan and indicators.

In parallel, in WP3, an analysis of required and innovative teaching methodologies has been carried out. This has led to the definition of 26 teaching methodologies that are listed in table 1. Then, teachers of the 64 classes have selected the teaching methodologies to be adopted in the classes. Therefore, each class will adopt one or a combination of these methodologies. A significant part of the course modernization is based on new equipment in joint university-industry labs, including joint activities with industrial partners (co-supervised theses, project tasks, student competitions and internships).

Out of the overall list of 64 classes, at least 43 classes have been selected to undergo modernization and implementation during the project timeline, while other courses will be implemented in next years according to recently finished or just initiated accreditation. These 43 selected classes will be modernized providing teaching material by the summer 2020. They will also be delivered by the end of the project, in more detail, some are already implemented, others will be delivered in the summer semester 2020, and some will start in the winter semester 2020. The remaining 22 classes (in the overall list of 64) will be delivered in and after the end of the project. Nonetheless, they are part of the modernization activity carried out in the BENEFIT project because they are thoroughly defined and prepared for accreditation.

In Table 2 we report the list of classes and associated details.

4. Accreditation of new and modernized courses

All 43 modernized courses developed within the BENEFIT project (30 at 1st cycle, 13 at 2nd cycle) have had their previous version accredited earlier. In Serbia all 17 courses were accredited in 2019 in their modernized version, while 26 courses in B&H are modernized under previous accreditation, which allows partial changes (modernization) and implementation during the project timeline.

The new courses developed within the BENEFIT project (21 in total, 8 at 1st cycle, 13 at 2nd cycle) are: 19 in Serbia, and 2 in B&H. The Serbian Universities completed the accreditation of these new courses during 2019, while 2 courses in B&H are waiting for new accreditation, namely at UNTZ - this will be completed after the project timeline due to the national procedures in B&H. Out of 19 new courses in Serbia 6 courses will be implemented in 2020/2021 school year for the first time, while only 4 new courses have to wait its implementation until 2023/2024. Parts of the content of these courses will be implemented also in other courses in the meantime.

5. Table 1. Teaching methodologies

Student-Oriented Teaching Methodologies	
1	Student-centered education
2	Flipped or inverted classroom
3	Teaching through student competitions
4	Teaching through debate
5	Brainstorming
6	The case study method
7	Peer group/team teaching (Collaborative teaching)
8	Teaching workshops
Activity-Oriented Teaching Methodologies	
9	Active learning
10	Research-related teaching
11	Project-based learning
12	Work-based learning
13	Curiosity-driven learning
14	Self-learning
15	Creative assignments
16	Pre-lecture based learning
17	Z to A approach
18	Block schedule
19	Patent base oriented syllabus
20	Teaching by following the standardization process (Learning by experiments with open hardware and software testbed)
21	Teaching fundamentals through vocation-related examples
Technology-Oriented Teaching Methodologies	
22	Online courses
23	Teaching support via websites and social media
24	Learning/teaching method based on audio library
25	Web-based engineering experiments
26	Teaching through games (Gamification)

6. Table 2a. BENEFIT enhanced and new courses.

	Course ID	Course name	Start date of implementation	Date of posting material on e-platform	Links		
	#		Spring Semester (SS), Winter Semester (WS), After project end (After)		e-platform (brief course description and teaching materials)	university website (course description as in accreditation)	L (list of enrolled students) and/or S (surveys) (available on confluence)
1	3	Telecommunication Networks	18SS	2020/04	https://www.project-benefit.eu/eplatform/?courses=22	https://etf.unibl.org/index.php/sr-RS/studiranje/1-ciklus/525-2324-program	L
2	9	Fundamentals of Electrical Engineering I	18WS	2020/02	https://www.project-benefit.eu/eplatform/?courses=17	https://etf.unibl.org/index.php/sr-RS/studiranje/1-ciklus/245-2226-program	L
3	11	Software Engineering (Telecommunications)	18WS	2020/02	https://www.project-benefit.eu/eplatform/?courses=39	-	-
4	13	Communication Protocols and Networks	18WS	2020/02	https://www.project-benefit.eu/eplatform/?courses=40	https://c2.etf.unsa.ba/course/view.php?id=136	-
5	14	Human Computer Interaction	18WS	2019/12	https://www.project-benefit.eu/eplatform/?courses=72	https://c2.etf.unsa.ba/course/view.php?id=204	-
6	10	Fundamentals of Electrical Engineering II	19SS	2019/11	https://www.project-benefit.eu/eplatform/?courses=18#view	https://etf.unibl.org/index.php/sr-RS/studiranje/1-ciklus/251-2234-program	L
7	16	Image and video compression	19SS	2020/06	https://www.project-benefit.eu/eplatform/?courses=65	https://c2.etf.unsa.ba/course/view.php?id=167	-
8	55	Modelling and Simulation of Communication Systems	19SS	2020/08	https://www.project-benefit.eu/eplatform/?courses=35	http://www.ftn.uns.ac.rs/674464826/power--electronic-and-telecommunication-engineering	-
9	2	Digital Signal Processing	19WS	2020/02	https://www.project-benefit.eu/eplatform/?courses=14	https://etf.unibl.org/index.php/sr-RS/studiranje/1-ciklus/268-2316-program	L
10	8	Systems for Digital Signal Processing	19WS	2020/02	https://www.project-benefit.eu/eplatform/?courses=21	https://etf.unibl.org/index.php/sr-RS/studiranje/1-ciklus/308-2289-program	L
11	18	Signals and Systems	19WS	2020/02	https://www.project-benefit.eu/eplatform/?courses=48	https://fet.ba/ciklus-1.html	-

12	19	Introduction to Electronics	19WS	2020/02	https://www.project-benefit.eu/eplatform/?courses=45	https://fet.ba/ciklus-1.html	-
13	21	Fundamentals of Communications	19WS	2020/02	https://www.project-benefit.eu/eplatform/?courses=44	https://fet.ba/ciklus-1.html	-
14	23	Microprocessor Systems in Telecommunications	19WS	2019/11	https://www.project-benefit.eu/eplatform/?courses=46	https://fet.ba/ciklus-1.html	-
15	30	Telecommunications 2	19WS	2020/02	https://www.project-benefit.eu/eplatform/?courses=11	https://www.etf.bg.ac.rs/fis/karton_predmeta/13E033T2-2019	-
16	33	IoT Networks	19WS	2020/02	https://www.project-benefit.eu/eplatform/?courses=5	https://www.etf.bg.ac.rs/fis/karton_predmeta/13E034IoT-2019	L
17	36	Multirate Systems	19WS	2020/02	https://www.project-benefit.eu/eplatform/?courses=74	https://www.etf.bg.ac.rs/fis/karton_predmeta/13M031SVB-2019	-
18	37	IoT Networks (architectures)	19WS	2020/02	https://www.project-benefit.eu/eplatform/?courses=50	https://www.etf.bg.ac.rs/fis/karton_predmeta/13E034IoT-2019	L
19	40	Measurements in Telecommunications	19WS	2020/03	https://www.project-benefit.eu/eplatform/?courses=25	http://kit.elfak.ni.ac.rs/	L
20	45	Circuit Design for 5G systems	19WS	2020/03	https://www.project-benefit.eu/eplatform/?courses=54	http://kit.elfak.ni.ac.rs/	L
21	46	Broadband Access Networks	19WS	2020/03	https://www.project-benefit.eu/eplatform/?courses=53	http://kit.elfak.ni.ac.rs/	L
22	47	Principles of Software Radio	19WS	2020/03	https://www.project-benefit.eu/eplatform/?courses=71	http://kit.elfak.ni.ac.rs/	L
23	50	Artificial Intelligence and Machine Learning for communication systems	19WS	2020/03	https://www.project-benefit.eu/eplatform/?courses=52	http://kit.elfak.ni.ac.rs/	L
24	51	Intelligent Audio Algorithms	19WS	2020/03	https://www.project-benefit.eu/eplatform/?courses=59	http://kit.elfak.ni.ac.rs/	L
25	56	Machine Learning 1 (former Pattern Recognition)	19WS	2020/06	https://www.project-benefit.eu/eplatform/?courses=33	http://www.ftn.uns.ac.rs/674464826/power--electronic-and-telecommunication-engineering	L
26	57	Software in Telecommunication Systems	19WS	2020/01	https://www.project-benefit.eu/eplatform/?courses=36	http://www.ftn.uns.ac.rs/674464826/power--electronic-and-telecommunication-engineering	L, S
27	49	Wireless Power Transfer and Energy Harvesting	19WS	After	https://www.project-benefit.eu/eplatform/?courses=55	http://kit.elfak.ni.ac.rs/	L
28	52	Statistical Learning in Signal Processing	19WS	After	https://www.project-benefit.eu/eplatform/?courses=56	http://kit.elfak.ni.ac.rs/	L
29	5	Fundamentals of Radar Systems	20SS	2020/04	https://www.project-benefit.eu/eplatform/?courses=19	https://etf.unibl.org/index.php/sr-RS/studiranje/1-ciklus/539-2347-program	-
30	6	Wireless Sensor Networks	20SS	2020/03	https://www.project-benefit.eu/eplatform/?courses=23	https://etf.unibl.org/index.php/sr-RS/studiranje/1-ciklus/305-2330-program	-

31	7	Multimedia Signals and Systems	20SS	2019/11	https://www.project-benefit.eu/eplatform/?courses=20#view	https://etf.unibl.org/index.php/sr-RS/studiranje/1-ciklus/493-2305-program	-
32	12	Antennas and Wave Propagation	20SS	2020/06	https://www.project-benefit.eu/eplatform/?courses=38	-	-
33	15	Advanced Telecommunication Protocols and New Generation Networks	20SS	2020/06	https://www.project-benefit.eu/eplatform/?courses=67	https://c2.etf.unsa.ba/course/view.php?id=232	-
34	20	Analog Integrated Electronics	20SS	2020/07	https://www.project-benefit.eu/eplatform/?courses=42	https://fet.ba/ciklus-1.html	-
35	22	Digital Communications	20SS	2020/07	https://www.project-benefit.eu/eplatform/?courses=43	https://fet.ba/ciklus-1.html	-
36	24	Sequential Circuits	20SS	2020/07	https://www.project-benefit.eu/eplatform/?courses=47	https://fet.ba/ciklus-1.html	-
37	26	Network Security	20SS	2020/07	https://www.project-benefit.eu/eplatform/?courses=69	https://fet.ba/ciklus-2.html	-
38	29	Telecommunications 1	20SS	2020/07	https://www.project-benefit.eu/eplatform/?courses=10	https://www.etf.bg.ac.rs/fis/karton_predmeta/13E032T1-2019	-
39	31	Signal Processing 2	20SS	2020/07	https://www.project-benefit.eu/eplatform/?courses=8	https://www.etf.bg.ac.rs/fis/karton_predmeta/19E034OS2-2019	-
40	32	Fundamentals of Speech Communication	20SS	2020/07	https://www.project-benefit.eu/eplatform/?courses=4	https://www.etf.bg.ac.rs/fis/karton_predmeta/13E033OGK-2019	-
41	35	Wireless Sensor Networks	20SS	2020/07	https://www.project-benefit.eu/eplatform/?courses=51	https://www.etf.bg.ac.rs/fis/karton_predmeta/13M031BSM-2019	-
42	38	Mobile Communication Systems	20SS	2020/05	https://www.project-benefit.eu/eplatform/?courses=27	http://kit.elfak.ni.ac.rs/	L
43	48	Big data analysis	20SS	2020/06	https://www.project-benefit.eu/eplatform/?courses=58	http://kit.elfak.ni.ac.rs/	-
44	53	Computing for IoT Communications	20SS	2020/06	https://www.project-benefit.eu/eplatform/?courses=57	http://kit.elfak.ni.ac.rs/	-
45	54	Telecommunication and Information Technologies in Telemedicine	20SS	2020/05	https://www.project-benefit.eu/eplatform/?courses=60	http://kit.elfak.ni.ac.rs/	-
46	1	Electrical Measurements	20WS	2020/04	https://www.project-benefit.eu/eplatform/?courses=16	https://etf.unibl.org/index.php/sr-RS/studiranje/1-ciklus/259-2244-program	-
47	4	Antenas and Radio Wave Propagation	20WS	2020/04	https://www.project-benefit.eu/eplatform/?courses=13	https://etf.unibl.org/index.php/sr-RS/studiranje/1-ciklus/531-2335-program	-
48	17	Telecommunications Network Management	20WS	2020/06	https://www.project-benefit.eu/eplatform/?courses=66	-	-
49	61	Big Data Management and Analysis	20WS	2020/06	https://www.project-benefit.eu/eplatform/?courses=61	http://www.ftn.uns.ac.rs/n1847675942/power--electronic-and-telecommunication-engineering	-

50	64	Security and Cryptography	20WS	2020/09	https://www.project-benefit.eu/eplatform/?courses=64	http://www.ftn.uns.ac.rs/n1847675942/power--electronic-and-telecommunication-engineering	-
51	62	Cognitive Radio	20WS (part 19WS)	2020/03	https://www.project-benefit.eu/eplatform/?courses=62	http://www.ftn.uns.ac.rs/n1847675942/power--electronic-and-telecommunication-engineering	-
52	63	Network Science	20WS (part 19WS)	2020/01	https://www.project-benefit.eu/eplatform/?courses=63	http://www.ftn.uns.ac.rs/n1847675942/power--electronic-and-telecommunication-engineering	-
53	34	Smart Devices and Communications	21SS- After	2021/07	https://www.project-benefit.eu/eplatform/?courses=9	https://www.etf.bg.ac.rs/fis/karton_predmeta/19E031PUK-2019	-
54	41	Data Analysis and Compression	23WS	2020/01	https://www.project-benefit.eu/eplatform/?courses=30	http://kit.elfak.ni.ac.rs/	L
55	43	Computer Communications and Internet access (II)	23WS	After	https://www.project-benefit.eu/eplatform/?courses=24	http://kit.elfak.ni.ac.rs/	-
56	59	Wireless Communication Systems	23WS (part 19WS)	2020/06	https://www.project-benefit.eu/eplatform/?courses=37	http://www.ftn.uns.ac.rs/674464826/power--electronic-and-telecommunication-engineering	-
57	39	Microwave Design for IoT	24SS	2020/05	https://www.project-benefit.eu/eplatform/?courses=26	http://kit.elfak.ni.ac.rs/	-
58	60	Design of Industrial IoT Systems	24SS (part 20SS)	2020/05	https://www.project-benefit.eu/eplatform/?courses=32	http://www.ftn.uns.ac.rs/674464826/power--electronic-and-telecommunication-engineering	-
59	42	Advanced RFIC for Telecommunication Systems	24SS-After	After	https://www.project-benefit.eu/eplatform/?courses=29	http://kit.elfak.ni.ac.rs/	-
60	44	Smart Systems and IoT	24SS-After	After	https://www.project-benefit.eu/eplatform/?courses=28	http://kit.elfak.ni.ac.rs/	-
61	58	Machine Learning 2	24SS-After	2020/10	https://www.project-benefit.eu/eplatform/?courses=34	http://www.ftn.uns.ac.rs/674464826/power--electronic-and-telecommunication-engineering	-
62	25	Telemedicine	After	2020/10	https://www.project-benefit.eu/eplatform/?courses=49	https://fet.ba/ciklus-1.html	-
63	28	IoT Networks	After	2020/10	https://www.project-benefit.eu/eplatform/?courses=68	https://fet.ba/ciklus-2.html	-
64	27	Telecommunication system programming	After	2020/10		https://fet.ba/ciklus-2.html	-

7. Table 2b. BENEFIT enhanced and new courses.

	Course ID	University	Course name	Cycle	Teacher(s)	Modernization	Type of developed material				Type of teaching methodology
	#			First (1), Second (2)		Enhanced (E) / New (N)	Book	Lectures slides	Lab practicum notes	Video	<i>The list selected methodologies with numbers as done in the table of 26 teaching / learning methods within WP3</i>
1	3	UBL	Telecommunication Networks	1	Gordana Gardašević	E			1		3, 8, 10, 11
2	9	UBL	Fundamentals of Electrical Engineering I	1	Aleksej Avramović, Mitar Simić	E				1	16, 22
3	11	UNSA	Software Engineering (Telecommunications)	1	Duška Bošković	E		1			2, 11
4	13	UNSA	Communication Protocols and Networks	1	Saša Mrdović	E		1	1		11
5	14	UNSA	Human Computer Interaction	2	Duška Bošković	E		1			9, 11
6	10	UBL	Fundamentals of Electrical Engineering II	1	Aleksej Avramović, Mitar Simić	E				1	16, 22
7	16	UNSA	Image and video compression	2	Emir Turajlić	E	1				2, 11
8	55	UNS	Modelling and Simulation of Communication Systems	1	Milan Narandžić	E		1			6, 8, 9, 10, 22, 23
9	2	UBL	Digital Signal Processing	1	Zdenka Babić	E	1	1	1		5, 8, 9, 11, 23
10	8	UBL	Systems for Digital Signal Processing	1	Zdenka Babić	E		1	1		5, 8, 9, 11, 23
11	18	UNTZ	Signals and Systems	1	Nermin Suljanović, Asmir Gogić	E	1	1		1	19, 24
12	19	UNTZ	Introduction to Electronics	1	Aljo Mujčić	E	1	1	1	1	24
13	21	UNTZ	Fundamentals of Communications	1	Nermin Suljanović, Asmir Gogić	E		1	1	1	11, 17
14	23	UNTZ	Microprocessor Systems in Telecommunications	1	Asmir Gogić	E		1	1	1	11, 17

15	30	UB	Telecommunications 2	1	Goran Marković	E		1	1		11
16	33	UB	IoT Networks	1	Goran Marković, Mladen Koprivica	N		1	1	1	2, 11
17	36	UB	Multirate Systems	2	Jelena Čertić	E		1			10
18	37	UB	IoT Networks (architectures)	2	Goran Marković, Mladen Koprivica	N		1	1	1	10, 11
19	40	UNI	Measurements in Telecommunications	1	Nebojša Dončov	E		1	1		7, 9, 12
20	45	UNI	Circuit Design for 5G systems	2	Nataša Maleš-Ilić, Olivera Pronić-Rančić	E	1	1			7, 9, 10, 15
21	46	UNI	Broadband Access Networks	2	Nebojša Dončov, Zoran Stanković	E		1			9, 11
22	47	UNI	Principles of Software Radio	2	Zorica Nikolić, Nenad Milošević	E		1			10, 11, 23
23	50	UNI	Artificial Intelligence and Machine Learning for communication systems	2	Zlatica Marinković, Zoran Stanković	N		1			9, 10, 11
24	51	UNI	Intelligent Audio Algorithms	2	Dejan Ćirić	N		1			5, 8, 9, 10, 11
25	56	UNS	Machine Learning 1 (former Pattern Recognition)	1	Tatjana Lončar-Turukalo	E		1	1	1	8, 9, 10, 11
26	57	UNS	Software in Telecommunication Systems	1	Živko Bojović	E	1	1	1		1, 6, 10
27	49	UNI	Wireless Power Transfer and Energy Harvesting	2	Nataša Maleš-Ilić, Nebojša Dončov	N		1			2, 9, 15
28	52	UNI	Statistical Learning in Signal Processing	2	Zoran Perić, Aleksandra Jovanović, Jelena Nikolić	N		1			9, 10
29	5	UBL	Fundamentals of Radar Systems	1	Slavko Šajić	E			1		5, 14, 15, 16, 17
30	6	UBL	Wireless Sensor Networks	1	Gordana Gardašević	E	1		1		3, 8, 10, 11
31	7	UBL	Multimedia Signals and Systems	1	Vladimir Risojević	E	1	1	1		10, 11, 13, 17
32	12	UNSA	Antennas and Wave Propagation	1	Mirza Hamza	E		1	1		6
33	15	UNSA	Advanced Telecommunication Protocols and New Generation Networks	2	Saša Mrdović	E		1	1		6
34	20	UNTZ	Analog Integrated Electronics	1	Aljo Mujčić	E	1	1	1	1	24

35	22	UNTZ	Digital Communications	1	Nermin Suljanović, Asmir Gogić	E		1	1	1	11, 17
36	24	UNTZ	Sequential Circuits	1	Asmir Gogić	E		1	1	1	11, 17
37	26	UNTZ	Network Security	2	Nermin Suljanović, Aljo Mujčić	E		1	1		6, 11
38	29	UB	Telecommunications 1	1	Vesna Blagojević	E		1			9, 11
39	31	UB	Signal Processing 2	1	Jelena Čertić	E	1		1		11
40	32	UB	Fundamentals of Speech Communication	1	Dragana Šumarac Pavlović, Miloš Bjelić	E			1		11
41	35	UB	Wireless Sensor Networks	2	Goran Marković	E		1	1		10, 11
42	38	UNI	Mobile Communication Systems	1	Vera Marković, Zlatica Marinković	E		1			2, 9, 15, 17, 23
43	48	UNI	Big data analysis	2	Daniela Milović	N		1	1	1	9, 10, 11
44	53	UNI	Computing for IoT Communications	2	Dejan Milić	N	1	1		1	4, 5, 6, 9, 11, 23
45	54	UNI	Telecommunication and Information Technologies in Telemedicine	2	Goran T. Đorđević, Dejan Milić, Daniela Milović	N		1	1	1	9, 10, 11
46	1	UBL	Electrical Measurements	1	Aleksej Avramović	E			1		16, 22
47	4	UBL	Antenas and Radio Wave Propagation	1	Slavko Šajjić	E			1		5, 14, 15, 16, 17
48	17	UNSA	Telecommunications Network Management	2	Miralem Mehić	E		1	1		6
49	61	UNS	Big Data - Management and Analysis	2	Tatjana Lončar-Turukalo, Živko Bojović	N		1	1	1	1, 6, 9, 10, 11
50	64	UNS	Security and Cryptography	2	Mladen Kovačević, Vojin Šenk	N		1			6, 9, 10, 23
51	62	UNS	Cognitive Radio	2	Milan Narandžić	N		1	1		6, 9, 11, 22, 23
52	63	UNS	Network Science	2	Dragana Bajović	N		1	1	1	6, 10, 11, 17
53	34	UB	Smart Devices and Communications	1	Mladen Koprivica	N			1	1	9
54	41	UNI	Data Analysis and Compression	1	Zoran Perić, Aleksandra Jovanović, Jelena Nikolić	E		1			9, 11

55	43	UNI	Computer Communications and Internet access (II)	1	Nebojša Dončov, Zoran Stanković	N		1	1		7, 8, 9, 12
56	59	UNS	Wireless Communication Systems	1	Dejan Vukobratović, Milan Narandžić	N		1	1	1	3, 10, 11, 20
57	39	UNI	Microwave Design for IoT	1	Nataša Maleš-Ilić, Olivera, Pronić-Rančić	E		1	1		2, 7, 9, 11
58	60	UNS	Design of Industrial IoT Systems	1	Živko Bojović, Milan Narandžić, Dejan Vukobratović	N		1	1		6, 9, 11, 22, 23
59	42	UNI	Advanced RFIC for Telecommunication Systems	1	Dejan Milić	E			1		9, 10, 11, 23
60	44	UNI	Smart Systems and IoT	1	Nataša Maleš-Ilić, Olivera Pronić-Rančić	N		1	1		2, 7, 9, 11
61	58	UNS	Machine Learning 2	1	Milan Sečujski, Tatjana Lončar-Turukalo, Nikša Jakovljević	N				1	8, 9, 10, 11
62	25	UNTZ	Telemedicine	1	Alma Šećerbegović	N		1	1		10, 11
63	28	UNTZ	IoT Networks	2	Nermin Suljanović, Aljo Mujčić	N		1	1		10, 11, 15
64	27	UNTZ	Telecommunication system programming	2	Asmir Gogić	E		1			10, 11