### Zal. nr 4 do ZW 78/2023 Attachment no. 3 to Program of Studies

# **PLAN OF STUDIES**

FACULTY: Information and Communication Technology

MAIN FIELD OF STUDY: Computer Engineering

**EDUCATION LEVEL:** second-level studies

**FORM OF STUDIES**: full-time studies

**PROFILE:** general academic

**SPECIALIZATION**: Internet Engineering (INE)

LANGUAGE OF STUDY: english

In effect since 2023/2024

#### Plan of studies structure (optionally)

1) in ECTS point layout (space for scheme of plan)

2) in hourly layout (space for scheme of plan)

<sup>&</sup>lt;sup>1</sup>BU – number of ECTS points assigned to hours of classes requiring direct participation of academic teachers and other persons conducting classes

<sup>&</sup>lt;sup>2</sup>Traditional – enter T, remote – enter Z, remote for lecture and seminar – Z\*

<sup>&</sup>lt;sup>3</sup>Exam – enter E, crediting – enter Z. For the group of classes – after the letter E or Z - enter in brackets the final subject form (lec, cl, lab, pr, sem)

<sup>&</sup>lt;sup>4</sup>University-wide subject /group of classes – enter O

<sup>&</sup>lt;sup>5</sup>DN - number of ECTS points assigned to the classes related to the University's academic activity in the discipline/disciplines to which the main field of study is assigned

<sup>&</sup>lt;sup>6</sup>Practical subject / group of classes – enter P. For the group of classes – in brackets enter the number of ECTS points assigned to practical courses

<sup>&</sup>lt;sup>7</sup>KO – general education courses, PD – basic sciences courses, K – main field of study courses, S – specialization courses

# 1. Set of obligatory and optional subjects and groups of classes in semestral arrangement

#### Semester 1

Obligatory subjects / groups of classes Number of ECTS points 29

No.	Subject /	bjects / groups of classe		Veekly		er of ho		ECTS poin	Numl	ber of urs	Numbe	er of ECTS	S points			Sul	oject / grou	ps of classe	S
	groups of classesco de	Name of subject / groups of classes (denote group of courses with symbol <b>GK</b> )	lec	cl	lab	pr	sem	Learning effect symbol	ZZU	CNPS	Total	DN <sup>5</sup> classes	BU¹ classes	Form <sup>2</sup> of subject / groups of classes	Way <sup>3</sup> of crediting	University -wide <sup>4</sup>	Concerni ng scientific activities <sup>5</sup>	Practical <sup>6</sup>	Type <sup>7</sup>
1	W11ITE- SM4001	Physics	1					K2ITE_W01	15	25	1		0,68	T/Z	Z	О			PD
2	W08W04 -SM4002	Social Communication					1	K2ITE_U02 K2ITE_K01	15	50	2		0,68	T/Z	Z	0		P(1)	КО
3	W04ITE- SM4010	Computer Project Management (GK)	2		1		1	K2ITE_W06 K2ITE_U03 K2ITE_K02 K2ITE_K03	60	125	5		2,88	T/Z*	E (w)			P(2,5)	K
4	W04ITE- SM4017 G	Optimization Methods: Theory and Applications (GK)	2			2		K2ITE_W05 K2ITE_W07 K2ITE_U08	60	125	5	5	2,72	T/Z*	Z(w)			P(2,5)	K
5	W04ITE- SM4018 G	IT Applications in Business and Commerce (GK)	2			2		K2ITE_W05 K2ITE_K03 K2ITE_U03	60	125	5	5	2,88	T/Z*	Z(w)		DN	P (2,5)	K
6	W04ITE- SM4019 G	Information Systems Modeling (GK)	2		1			K2ITE_W06 K2ITE_U04	45	75	3	3	2,04	T/Z*	Z (w)		DN	P(1,5)	K
7	W04ITE- SM4013	Discrete Mathematics (GK)	2			2		K2ITE_W01 K2ITE_U04	60	125	5		3,04	T/Z*	E (w)			P (2,5)	K
8	W04ITE- SM4020 G	Research Skills and Methodologies (GK)	1				2	K2ITE_W03 K2ITE_K04	45	75	3	3	2,04	T/Z	Z		DN	P (2)	K
		Total	12	0	2	6	4	-	360	725	29	16	16,96	-	_	_	-	P (14,5)	-

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 $<sup>^2</sup>$ Traditional – enter T, remote – enter Z, remote for lecture and seminar –  $Z^*$ 

<sup>&</sup>lt;sup>3</sup>Exam – enter E, crediting – enter Z. For the group of classes – after the letter E or Z - enter in brackets the final subject form (lec, cl, lab, pr, sem)

<sup>&</sup>lt;sup>4</sup>University-wide subject /group of classes – enter O

<sup>&</sup>lt;sup>5</sup>DN - number of ECTS points assigned to the classes related to the University's academic activity in the discipline/disciplines to which the main field of study is assigned

<sup>&</sup>lt;sup>6</sup>Practical subject / group of classes – enter P. For the group of classes – in brackets enter the number of ECTS points assigned to practical courses

<sup>&</sup>lt;sup>7</sup>KO – general education courses, PD – basic sciences courses, K – main field of study courses, S – specialization courses

**Optional subjects (minimum 15 hours in semester, 1 ECTS points)** 

Ño.	Subject / groups of	Name of subject / groups of classes (denote group of courses with symbol <b>GK</b> )	V	Veekly	numbe	er of ho	ours	Learning		ber of urs	Numbe	er of ECTS	points	Form <sup>2</sup> of		Sul	oject / grou	ps of classe	es
	classesco de		lec	cl	lab	pr	sem	effect symbol	ZZU	CNPS	Total	DN <sup>5</sup> classes	BU¹ classes	subject / groups of classes	Way <sup>3</sup> of crediting	University -wide <sup>4</sup>	Concerni ng scientific activities <sup>5</sup>	Practical <sup>6</sup>	Type <sup>7</sup>
1	SJO- SM0001	Foreing Language I		1				K2ITE _U01	15	30	1		0,63	T	Z	0		P(1)	КО
		Total	0	1	0	0	0	-	15	30	1	0	0,63	-	-	-	-	P (1)	1

Altogether in semester

	Total r	number o	f hours		Total number of ZZU hours	Total number of CNPS hours	Total number of ECTS points	Total number of ECTS points for DN classes <sup>5</sup>	Number of ECTS points for BU classes <sup>1</sup>
lec	cl	lab	pr	sem					
12	1	2	6	4	375	755	30	16	17,59

<sup>&</sup>lt;sup>1</sup>BU – number of ECTS points assigned to hours of classes requiring direct participation of academic teachers and other persons conducting classes

<sup>&</sup>lt;sup>2</sup>Traditional – enter T, remote – enter Z, remote for lecture and seminar – Z\*

<sup>&</sup>lt;sup>3</sup>Exam – enter E, crediting – enter Z. For the group of classes – after the letter E or Z - enter in brackets the final subject form (lec, cl, lab, pr, sem)

<sup>&</sup>lt;sup>4</sup>University-wide subject /group of classes – enter O

<sup>&</sup>lt;sup>5</sup>DN - number of ECTS points assigned to the classes related to the University's academic activity in the discipline/disciplines to which the main field of study is assigned

<sup>&</sup>lt;sup>6</sup>Practical subject / group of classes – enter P. For the group of classes – in brackets enter the number of ECTS points assigned to practical courses

<sup>&</sup>lt;sup>7</sup>KO – general education courses, PD – basic sciences courses, K – main field of study courses, S – specialization courses

#### Semester 2

Obligatory subjects / groups of classes Number of ECTS points 3

No.	Subject / groups of	Name of subject / groups of classes	V	Veekly	numbe	er of ho	ours	Learning	_	per of urs	Numbe	er of ECTS	points	Form <sup>2</sup> of		Sul	oject / grou	ps of classe	es
	classesco de	(denote group of courses with symbol <b>GK</b> )	lec	cl	lab	pr	sem	effect symbol	ZZU	CNPS	Total	DN <sup>5</sup> classes	BU¹ classes	subject / groups of classes	Way <sup>3</sup> of crediting	University -wide <sup>4</sup>	Concerni ng scientific activities <sup>5</sup>	Practical <sup>6</sup>	Type <sup>7</sup>
1	W04ITE- SM4021 G	Secure systems and networks (GK)	2		1			K2ITE _W04 K2ITE U04	45	75	3	3	2,04	T/Z*	Z (w)		DN	P(1)	K
	•	Total	2	0	1	0	0	_	45	75	3	3	2,04	ı	_	-	-	P (1)	_

Optional subjects / groups of classes(minimum 45 hours in semester, 2 ECTS points)

No.	Subject / groups of	Name of subject / groups of classes	V	Veekly	numbe	er of ho	ours	Learning		ber of urs	Numbe	er of ECTS	points	Form <sup>2</sup> of		Sul	bject / grou	ps of classe	es
	classesco de	(denote group of courses with symbol <b>GK</b> )	lec	cl	lab	pr	sem	effect symbol	ZZU	CNPS	Total	DN <sup>5</sup> classes	BU <sup>1</sup> classes	subject / groups of classes	Way <sup>3</sup> of crediting	University -wide <sup>4</sup>	Concerni ng scientific activities <sup>5</sup>	Practical <sup>6</sup>	Type <sup>7</sup>
1	SJO- SM0002	Foreign Language II		3				K2ITE _U01	45	60	2		1,63	Т	Z	0		P (2)	КО
		Total	0	3	0	0	0	I	45	60	2	0	1,63	_	ı	_	-	P (2)	_

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<sup>&</sup>lt;sup>2</sup>Traditional – enter T, remote – enter Z, remote for lecture and seminar – Z\*

<sup>&</sup>lt;sup>3</sup>Exam – enter E, crediting – enter Z. For the group of classes – after the letter E or Z - enter in brackets the final subject form (lec, cl, lab, pr, sem)

<sup>&</sup>lt;sup>4</sup>University-wide subject /group of classes – enter O

<sup>&</sup>lt;sup>5</sup>DN - number of ECTS points assigned to the classes related to the University's academic activity in the discipline/disciplines to which the main field of study is assigned

<sup>&</sup>lt;sup>6</sup>Practical subject / group of classes – enter P. For the group of classes – in brackets enter the number of ECTS points assigned to practical courses

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Optional subjects / groups of classes - Internet Engineering (minimum 285 hours in semester, 25 ECTS points)

0 0 02 0	3 11 to 1 5 to 2 j	ects / groups of classes				8	·	(		0 444 0 4				7 2 ~ 002	1100)				
No.	Subject / groups of	Name of subject / groups of	V	Veekly	numbe	er of ho	ours	Learning effect	Numl ho	ber of urs	Numbe	er of ECTS	points	Form <sup>2</sup> of		Sul	oject / grou	ps of classe	s
	classesco de	classes (denote group of courses with symbol <b>GK</b> )	lec	cl	lab	pr	sem	symbol	ZZU	CNPS	Total	DN <sup>5</sup> classes	BU¹ classes	subject / groups of classes	Way <sup>3</sup> of crediting	University -wide <sup>4</sup>	Concerni ng scientific activities <sup>5</sup>	Practical <sup>6</sup>	Type <sup>7</sup>
1	W04ITE- SM4116	Application Programming – Java and XML Technologies ( <b>GK</b> )	2	1	1			K2ITE_W09 K2ITE_U10	60	125	5	5	2,72	T/Z*	Z (w)		DN	P (2,5)	S
2	W04ITE- SM4117	Information Systems Analysis (GK)	2		2			K2ITE_W07 K2ITE_U08	60	125	5	5	2,88	T/Z*	E (w)		DN	P (3)	S
3	W04ITE- SM4120 G	Advanced Databases (GK)	2		2			K2ITE_W07 K2ITE_U09	60	125	5	5	2,72	T/Z*	Z(w)		DN	P (2,5)	S
4	W04ITE- SM4119	Softcomputing (GK)	2			2		K2ITE_W08 K2ITE_U08	60	125	5	5	2,88	T/Z*	Z (w)		DN	P (2)	S
5	W04ITE- SM4115	Multimedia and Computer Visualization ( <b>GK</b> )	1			2		K2ITE_W07 K2ITE_U08	45	125	5	5	2,36	T/Z*	E (w)		DN	P (3)	S
		Total	9	1	5	4	0	-	285	625	25	25	13,5 6	_	ı	-	-	P (13)	-

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 $<sup>^2</sup>$ Traditional – enter T, remote – enter Z, remote for lecture and seminar –  $Z^*$ 

<sup>&</sup>lt;sup>3</sup>Exam – enter E, crediting – enter Z. For the group of classes – after the letter E or Z - enter in brackets the final subject form (lec, cl, lab, pr, sem)

<sup>&</sup>lt;sup>4</sup>University-wide subject /group of classes – enter O

<sup>&</sup>lt;sup>5</sup>DN - number of ECTS points assigned to the classes related to the University's academic activity in the discipline/disciplines to which the main field of study is assigned

<sup>&</sup>lt;sup>6</sup>Practical subject / group of classes – enter P. For the group of classes – in brackets enter the number of ECTS points assigned to practical courses

<sup>&</sup>lt;sup>7</sup>KO – general education courses, PD – basic sciences courses, K – main field of study courses, S – specialization courses

#### Altogether in semester

	Total r	number o	f hours		Total number of ZZU hours	Total number of CNPS hours	Total number of ECTS points	Total number of ECTS points for DN classes <sup>5</sup>	Number of ECTS points for BU classes <sup>1</sup>
lec	cl	lab	pr	sem					
11	4	6	4	0	375	760	30	28	17,23

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<sup>&</sup>lt;sup>3</sup>Exam – enter E, crediting – enter Z. For the group of classes – after the letter E or Z - enter in brackets the final subject form (lec, cl, lab, pr, sem)

<sup>&</sup>lt;sup>4</sup>University-wide subject /group of classes – enter O

<sup>&</sup>lt;sup>5</sup>DN - number of ECTS points assigned to the classes related to the University's academic activity in the discipline/disciplines to which the main field of study is assigned

<sup>&</sup>lt;sup>6</sup>Practical subject / group of classes – enter P. For the group of classes – in brackets enter the number of ECTS points assigned to practical courses

<sup>&</sup>lt;sup>7</sup>KO – general education courses, PD – basic sciences courses, K – main field of study courses, S – specialization courses

#### Semester 3

Obligatory subjects / groups of classes Number of ECTS points 3

No.	Subject / groups of	Name of subject / groups of	V	Veekly	numb	er of ho	ours	Learning effect		ber of urs	Numb	er of ECTS	S points	Form <sup>2</sup> of subject /	Way <sup>3</sup> of	Sul	bject / grou	ps of classe	s
	classesco de	classes (denote group of courses with symbol <b>GK</b> )	lec	cl	lab	pr	sem	symbol	ZZU	CNPS	Total	DN <sup>5</sup> classes	BU <sup>1</sup> classes	groups of classes	crediting	University -wide <sup>4</sup>	Concerni ng scientific activities <sup>5</sup>	Practical <sup>6</sup>	Type <sup>7</sup>
1	W08W04 -SM4006	Entepreneurship (GK)	1				1	K2ITE_W02 K2ITE_K02	30	75	3		1,36	T/Z	Z (w)	0		P (1,5)	KO
		Total	1	0	0	0	1	_	30	75	3	0	1,36	_	_	_	-	P (1,5)	_

Optional subjects / groups of classes - Internet Engineering (minimum 345 hours in semester, 27 ECTS points)

No.	Subject / groups of	Name of subject / groups of	V	Veekly	numbe	er of ho	ours	Learning effect	Numl ho	ber of urs	Numbe	er of ECTS	points	Form <sup>2</sup> of subject /	Way³ of	Sul	oject / grou	ps of classe	s
	classesco de	classes (denote group of courses with symbol <b>GK</b> )	lec	cl	lab	pr	sem	symbol	ZZU	CNPS	Total	DN <sup>5</sup> classes	BU <sup>1</sup> classes	groups of classes	crediting	University -wide <sup>4</sup>	Concerni ng scientific activities <sup>5</sup>	Practical <sup>6</sup>	Type <sup>7</sup>
1	W04ITE- SM4114	Internet Engineering Seminar					2	K2ITE_U05 K2ITE_U06	30	75	3	3	1,36	T/Z	Z		DN	P (3)	S
2	W04ITE- SM4113	Final Project						K2ITE_U06	165	275	11	11	1,84	T	Z		DN	P (12)	S
3	W04ITE- SM4121 G	Application Programming – Data Mining and Data Warehousing ( <b>GK</b> )	2		2	1		K2ITE_W07 K2ITE_U09	75	150	6	6	3,48	T/Z*	Z (w)		DN	P (4)	S
4	W04ITE- SM4122 G	Application Programming – Mobile Computing ( <b>GK</b> )	2		2		1	K2ITE_W09 K2ITE_U10	75	175	7	7	3,4	T/Z*	Z (w)		DN	P (4)	S
		Total	4	0	4	1	3	_	345	675	27	27	10,08	-	_	_	-	P (23)	_

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<sup>&</sup>lt;sup>3</sup>Exam – enter E, crediting – enter Z. For the group of classes – after the letter E or Z - enter in brackets the final subject form (lec, cl, lab, pr, sem)

<sup>&</sup>lt;sup>4</sup>University-wide subject /group of classes – enter O

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<sup>&</sup>lt;sup>6</sup>Practical subject / group of classes – enter P. For the group of classes – in brackets enter the number of ECTS points assigned to practical courses

<sup>&</sup>lt;sup>7</sup>KO – general education courses, PD – basic sciences courses, K – main field of study courses, S – specialization courses

Altogether in semester

	Total 1	number o			Total number of ZZU hours	Total number of CNPS hours	Total number of ECTS points	Total number of ECTS points for DN classes <sup>5</sup>	Number of ECTS points for BU classes <sup>1</sup>
lec	cl	lab	pr	sem					
5	0	4	1	4	375	750	30	27	11,44

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<sup>&</sup>lt;sup>3</sup>Exam – enter E, crediting – enter Z. For the group of classes – after the letter E or Z - enter in brackets the final subject form (lec, cl, lab, pr, sem)

<sup>&</sup>lt;sup>4</sup>University-wide subject /group of classes – enter O

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<sup>&</sup>lt;sup>6</sup>Practical subject / group of classes – enter P. For the group of classes – in brackets enter the number of ECTS points assigned to practical courses

<sup>&</sup>lt;sup>7</sup>KO – general education courses, PD – basic sciences courses, K – main field of study courses, S – specialization courses

#### 2. Set of examinations in semestral arrangement

Subject / groups of classescode	Names of subjects / groups of classesending with examination	Semester
W04ITE-SM4010	Computer Project Management	1
W04ITE-SM4013	Discrete Mathematics	1
W04ITE-SM4117	Information Systems Analysis	2
W04ITE-SM4115	Multimedia and Computer Visualization	2

### 3. Numbers of allowable deficit of ECTS points after particular semesters

Semester	Allowable deficit of ECTS points after semester
1	8
2	8

The deficit after semester 2 applies ONLY to courses/groups of courses not passed in semester 1 (all courses/groups of courses from semester 2 must be passed).

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<sup>&</sup>lt;sup>3</sup>Exam – enter E, crediting – enter Z. For the group of classes – after the letter E or Z - enter in brackets the final subject form (lec, cl, lab, pr, sem)

<sup>&</sup>lt;sup>4</sup>University-wide subject /group of classes – enter O

<sup>&</sup>lt;sup>5</sup>DN - number of ECTS points assigned to the classes related to the University's academic activity in the discipline/disciplines to which the main field of study is assigned

<sup>&</sup>lt;sup>6</sup>Practical subject / group of classes – enter P. For the group of classes – in brackets enter the number of ECTS points assigned to practical courses

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Opinion of student government legislative body	
Date	Name and surname, signature of student representative
Date	Dean's signature

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<sup>&</sup>lt;sup>3</sup>Exam – enter E, crediting – enter Z. For the group of classes – after the letter E or Z - enter in brackets the final subject form (lec, cl, lab, pr, sem)

<sup>&</sup>lt;sup>4</sup>University-wide subject /group of classes – enter O

<sup>&</sup>lt;sup>5</sup>DN - number of ECTS points assigned to the classes related to the University's academic activity in the discipline/disciplines to which the main field of study is assigned

<sup>&</sup>lt;sup>6</sup>Practical subject / group of classes – enter P. For the group of classes – in brackets enter the number of ECTS points assigned to practical courses

<sup>&</sup>lt;sup>7</sup>KO – general education courses, PD – basic sciences courses, K – main field of study courses, S – specialization courses