

Procedure for introducing the new study program at University of Novi Sad (UNS)

Prof. dr Milan SIMIĆ – Vice-Rector for Teaching

TEMPUS MOREM – Maribor Workshop, 13.-17. 04. 2010





Procedure for introducing the study program at University of Novi Sad

All procedures for the introduction of the new study program are specified by:

- 1. Law on Higher Education (LHE)**
- 2. National Council for Higher Education (NCHE) and**
- 3. Statute of UNS.**

Starting points:

- ✓ The study program is a set of compulsory and optional study areas or courses, with approximate content whose completion provides the necessary knowledge and skills appropriate to graduate level and type of study.
- ✓ UNS as a higher education institution has three cycles of study.
- ✓ UNS realized studies according to the European Credit Transfer and Accumulation System (ECTAS or ECTS credit).
- ✓ ECTS system is applied with the following objectives:
 - student-oriented and based on the transparency of the learning process and learning outcomes
 - a quantitative measurement of the workload and activities.



1. The LHE determines the content of the study program!

Each study program is comprised of the following elements:

1. Names and objectives of the study program;
2. Type of study and the outcome of the learning process;
3. Professional, academic and/or scientific title;
4. Enrolling conditions for the study program;
5. A list of compulsory and optional study fields or courses, with the outline of contents;
6. The manner of conducting studies and period of time needed to realize individual forms of studies;



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7. Scoring value of each course shown in ECTS;
8. Scoring value of the final thesis (in ECTS):
9. Scoring value of study program (in ECTS);
10. Criteria for admission to study individual course or groups of courses;
11. Manner of choosing courses from other study programs;
12. Conditions for transfer from other study programs within the same or related fields of study;
13. Other issues of relevance for the implementation of the study program.



2. NCHE establishes standards for the accreditation of study program

- Standard 1: The structure of the study program
- Standard 2: The purpose of the study program
- Standard 3: The objectives of the study program
- Standard 4: Competencies of graduates (*Learning outcomes*)
- Standard 5: Curriculum
 - List of compulsory and optional courses with the outline of contents (book of courses)
 - Participation of optional courses at each level
 - Participation of general-academic, methodological –theoretical, scientific-technical and professional-applied courses
 - Schedule of lectures and exercises in semesters and years of study (students' workload)



Procedure for introducing the study program at University of Novi Sad

- Standard 6: The quality, modernity and the international harmonization of study programs
- Standard 7: Student enrollment
- Standard 8: Evaluation and promotion of students
- Standard 9: Teaching staff :
 - Scientific, artistic and professional qualifications of teachers and associates and teaching responsibilities (teachers book)
 - Maximum number of students in a group for theoretical and practical instruction
 - Required number of teachers and assistants for study program
 - Workload of academic staff
- Standard 10: Organizational and financial resources
- Standard 11: Quality Control
- Standard 12: Distance learning (e-Learning)



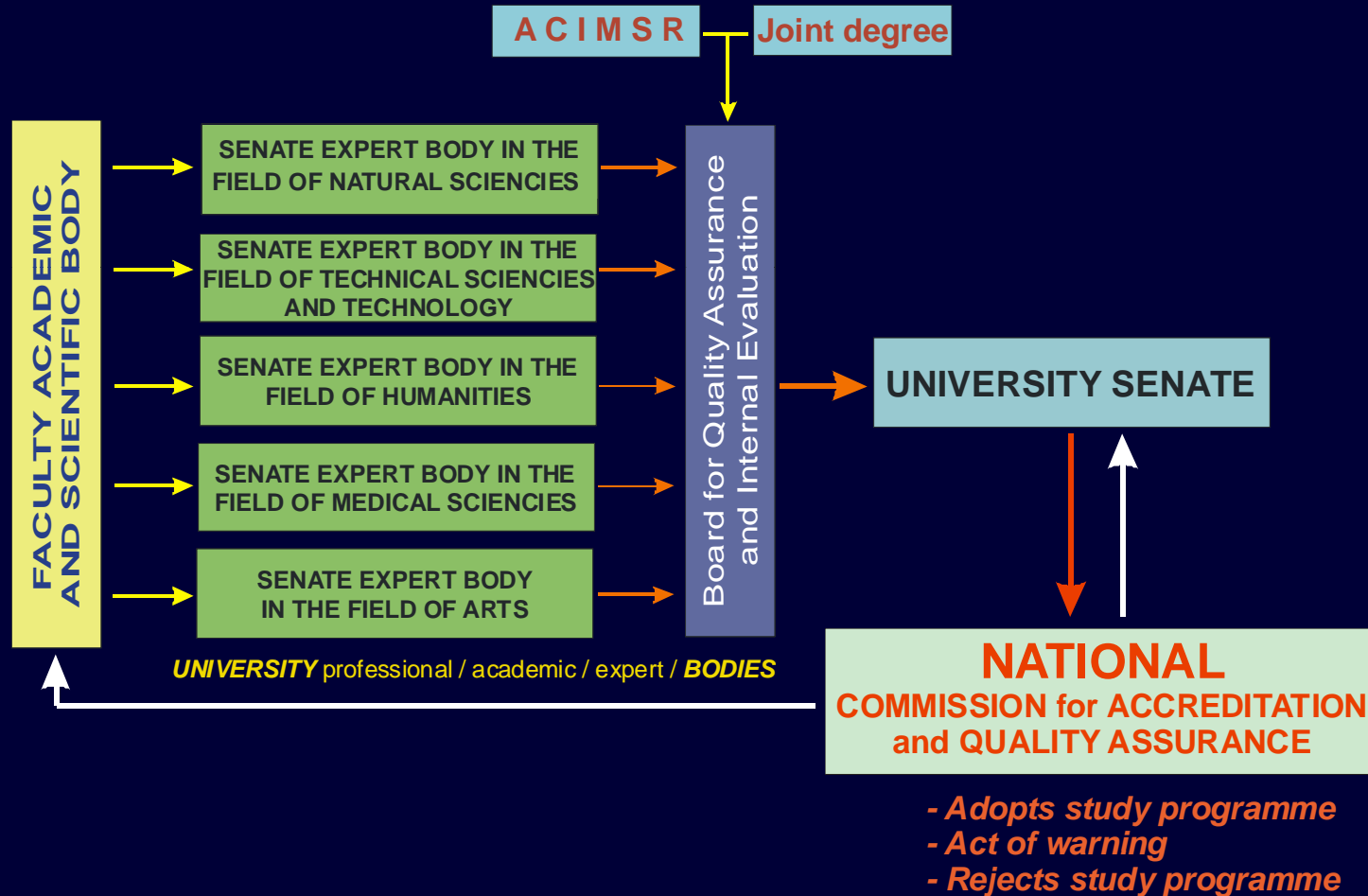
3. The Statute UNS establishes procedures for introducing and accreditation of study program

- ❖ Faculties propose study programs at all levels.
- ❖ University establishes interdisciplinary and multidisciplinary study programs through ACIMSR – special higher education units of University.
- ❖ ACIMSR - Association of University Centers for Interdisciplinary and Multidisciplinary Studies and Research - consists of University centers established by the decision of the Senate for the realization of a particular study program in interdisciplinary and multidisciplinary areas defined by the University and implemented in cooperation with one or more academic units.



Procedure for introducing the study program at University of Novi Sad

Pathway*



*This pathway is not required by Law. It is the specificity of UNS



Current status

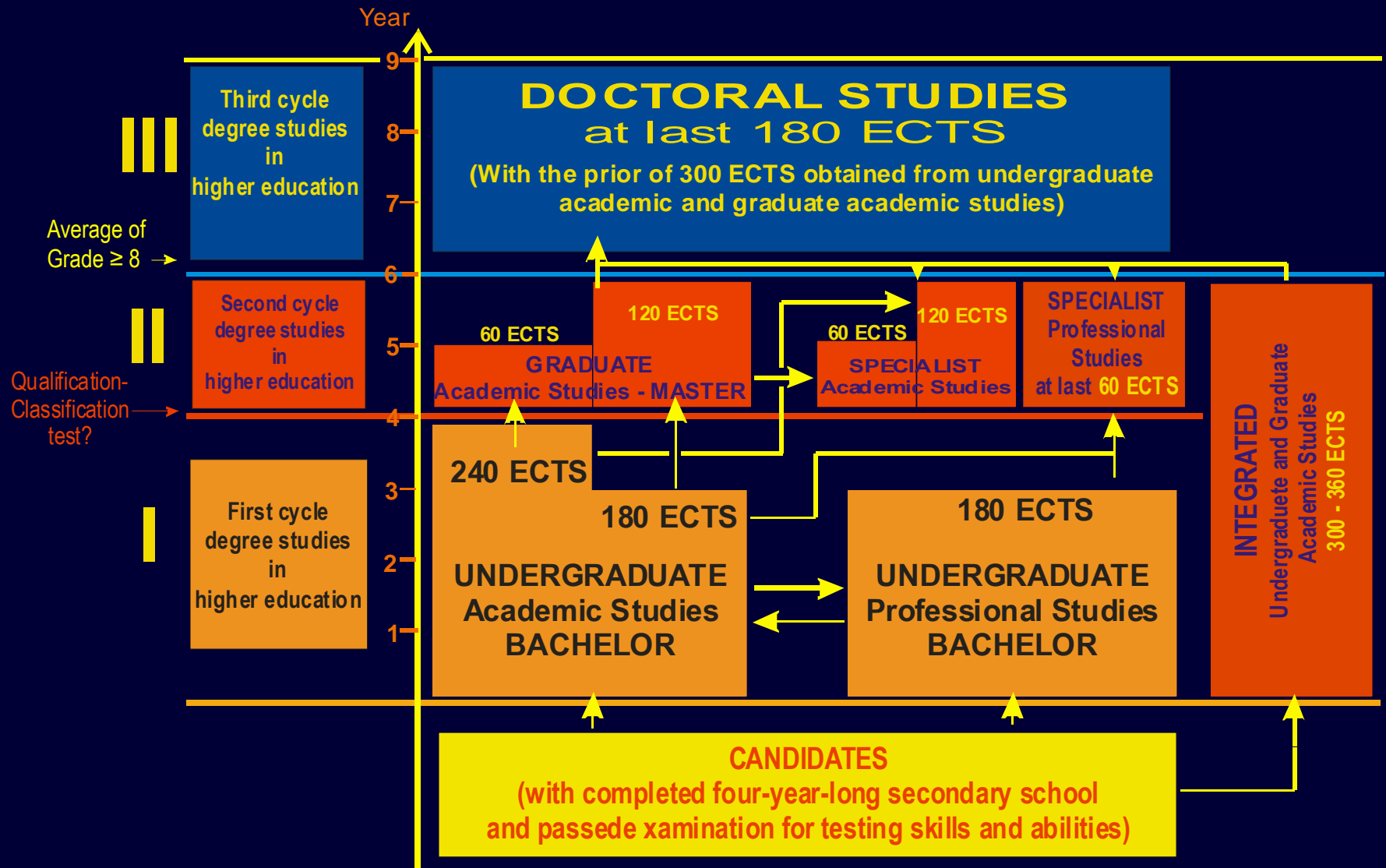
Cycle of study	Types of studies	TOTAL	
First	Undergraduate Professional Studies	4	93
	Undergraduate Academic Studies	89	
Second	Graduate Academic Studies	91	96
	Integrated Undergraduate and Graduate Academic Studies	5	
	Specialist Professional Studies	0	
	Specialist Academic Studies	0	
Third	Doctoral Studies	48	48
		237	

Levels of study and *Credit Accumulation System* are determined by the Statute (article 96) of UNS

3 + 2 + 3

4 + 1 + 3

5-6 + 3





How are the workload and activities of students measured in the study program?

- ✓ ECTS is a quantitative measurement of the workload and activities for each course and overall study program in a specific area.
- ✓ Quantitative measures of student activities in the successful completion of a course (ECTS) is expressed in points.
- ✓ The student can achieve a maximum of 100 points, as follows:
(Illustrative example is the course of Anatomy in the first year of Medical School)

Structure of students' activities

Year of study	Winter semester (N° of hours per week)		Summer semester (N° of hours per week)		N° of tests	N° of seminars	N° of ECTS
	Lectures	Exercises	Lectures	Exercises			
First	5	5	4	5	9	1	23

Evaluation of student activities - number of points for each activity							Total
Pre-exam commitment					Final exam*		
Lectures	Exercises	Tests	Seminar	Other activities	Written exam	Oral examination	100
15	30	10	5	0	20	20	

* Can not be less than 30 nor more than 70 points

DIPLOMA UNDERGRADUATE ACADEMIC STUDIES



РЕПУБЛИКА СРБИЈА

УНИВЕРЗИТЕТ У НОВОМ САДУ
ФАКУЛТЕТ ТЕХНИЧКИХ НАУКА, НОВИ САД

Оснивач високошколске установе НАРОДНА СКУПШТИНА НАРОДНЕ РЕПУБЛИКЕ СРБИЈЕ је издала
ФАКУЛТЕТУ ТЕХНИЧКИХ НАУКА, НОВИ САД дозволу за рад ИВ бр. 238 од 18. маја 1960. године.

ДИПЛОМА

Бојана (Радован) Дракула

рођена 12.07.1985. године у месту Загреб, Република Хрватска, уписана школске 2004/05 године на прву студијску годину, а дана 10.02.2010. године завршила је Основне академске студије (студије I степена) на студијском програму ИНЖЕЊЕРСКИ МЕНАџМЕНТ, студијска група МЕНАѢМЕНТ ЉУДСКИХ РЕСУРСА са просечном оценом 7,90 (седам и 90/100) у току студија и постигнутим укупним бројем ЕСПБ бодова 240 (двеста четрдесет).

На основу тога издаје јој се ова диплома о стеченом високом образовању и академском називу

ИНЖЕЊЕР МЕНАѢМЕНТА

из области ИНДУСТРИЈСКОГ ИНЖЕЊЕРСТВА И ИНЖЕЊЕРСКОГ МЕНАѢМЕНТА
СА СВИМ ПРАВИМА, ПРИВИЛЕГИЈАМА, ОДГОВОРНОСТИМА И ПОШТОВАЊУ КОЈЕЈ ОЈ ПО ЗАКОНУ ПРИПАДАЈУ

Број дипломе: 012-Б-87/И, 18.05.2010. године
у Новом Саду

ДЕКАН

проф. др Илија Ћосић

РЕКТОР

проф. др Мирослав Весковић

BA000124



REPUBLIC OF SERBIA

UNIVERSITY OF NOVI SAD
FACULTY OF TECHNICAL SCIENCES, NOVI SAD

The founder of the higher education institution, the National Assembly of the People's Republic of Serbia, has issued
to the FACULTY OF TECHNICAL SCIENCES, NOVI SAD operating licence IV. No. 238 on 18th May 1960.

DIPLOMA

Bojana (Radovan) Drakula

born on 12 July 1985 in Zagreb, the Republic of Croatia, enrolled the first year studies in the academic year 2004/2005, and completed the Undergraduate Academic Studies (first cycle degree studies) on 11 February 2010 according to the Engineering Management study programme, Human Resources Management study group, with the average grade of 7.90 (seven point nine zero) over the course of studies and obtained the total number of 240 (two hundred and forty) ECTS credits.

Hereby, the student is awarded the higher education diploma and the academic degree of

BACHELOR IN ENGINEERING MANAGEMENT

in the field of INDUSTRIAL ENGINEERING AND MANAGEMENT
WITH ALL RIGHTS, PRIVILEGES, RESPONSIBILITIES AND A RESPECT ANTITLED BY LAW.

No. 012-B-87/I, 18 May 2010
in Novi Sad

DEAN

Prof. Ilija Ćosić, Ph. D.

RECTOR

Prof. Miroslav Vesковиć, Ph. D.

BA000124

DIPLOMA SUPPLEMENT UNDERGRADUATE ACADEMIC STUDIES



Republic of Serbia
University of Novi Sad,
Faculty of Technical Sciences
Trg Dositeja Obradovića 6, 21000 Novi Sad



Diploma Supplement

This Diploma Supplement follows the model developed by the European Commission, Council of Europe and UNESCO/CEPES. The purpose of the supplement is to provide sufficient independent data to improve the international 'transparency' and fair academic and professional recognition of qualifications (diplomas, degrees, certificates etc.). It is designed to provide a description of the nature, level, context, content and status of the studies that were pursued and successfully completed by the individual named on the original qualification to which this supplement is appended. It should be free from any value judgements, equivalence statements or suggestions about recognition. Information in all eight sections should be provided. Where information is not provided, an explanation should give the reason why.

1. INFORMATION IDENTIFYING THE HOLDER OF THE QUALIFICATION

1.1 Surname:

1.2 First Name(s):

1.3 Date of birth (day/month/year):

1.4 Student identification number or code (if available): JMBG (personal code):

2. INFORMATION IDENTIFYING THE QUALIFICATION

2.1 Level of qualification and (if applicable) title conferred:

Bachelor in Electrical and Computer Engineering

2.2 Main field(s) of study for the qualification:

Electrical and Computer Engineering – Computing and Control Engineering - Computer Engineering and Computer Communications

2.3 Name and status of awarding institution (in original language):

Univerzitet u Novom Sadu, Fakultet tehničkih nauka, Novi Sad, state institution

2.4 Name and status of institution (if different from 2.3) administering studies (in original language):

same as 2.3

2.5 Language(s) of instruction/examination:

Serbian

3. INFORMATION ON THE LEVEL OF THE QUALIFICATION:

3.1 Level of qualification:

Undergraduate Academic Studies Bachelor

3.2 Official duration of programme:

Undergraduate academic studies last 8 semesters (4 years) and are worth at least 240 ECTS (1 ECTS is worth 30 hours of work).

3.3 Access requirement(s):

Completed four years of secondary education and passed entrance examination defined by the study programme.

4. INFORMATION ON THE CONTENTS AND RESULTS GAINED:

4.1 Mode of study:

Full-time

4.2 Programme requirements:

A candidate who has completed the undergraduate academic studies defined in section mark 3.2 and produced the final paper receives the title of Bachelor in Engineering in the selected field of study.
The final paper for the title of an Engineer, for any given study programme is a student's final work and represents their final exam after which the undergraduate academic studies are complete. The final paper consists of the theoretical background, the writing and defence of the paper. By writing and defending the final paper before a committee consisting of three university professors, a student demonstrates extended theoretical and practical knowledge in the corresponding field of study and the ability to apply it in the engineering practice.

A Bachelor in Engineering has broad and integrated knowledge and understanding of the theoretical background in the chosen field of study, is competent to analyze and understand tasks related to his part of the work, is able to design and thoroughly consider, formulate, present and discuss suggested problem solutions, to apply the acquired knowledge in practice and exchange ideas and information with experts in the stated field as well as with the general public. He/she is trained to take responsibility while working as a team member, has gained independence in education and professional-training, uses information and communication technologies to acquire knowledge in the stated field, has the knowledge and understanding of the impact that engineering solutions have on the environment and the community as a whole.

4.3 Please see next page:

4.4 Grading scheme and, if available, grade distribution guidance:

Grade	Grade distribution guidance	Percentage of the overall number of points (%)
10	A Excellent – with distinction	95 – 100
9	B Excellent	85 – 94
8	C Very good	75 – 84
7	D Good	65 – 74
6	E Satisfactory	55 – 64
5	F Fail	to 54

The lowest passing grade is 6, the maximum 10. Also, there is a possibility to use (passed / failed).

4.5 Overall classification of the qualification (in original language):

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4.3 Programme details (e.g. modules or units studied) and the individual grades/credits obtained:

Code	Course name	Total number of classes		Examination		Teacher	Note	
		Lectures	Practical	Passed/ Accepted	Grade			ECTS
E212	Mathematical Analysis 1	60	60	passed	6 (six)	9	Ilija Kovacevic	0
E213	Discrete Mathematics and Linear Algebra	60	60	passed	7 (seven)	9	Rade Doroslovački	0
E214	Programming Languages and Data Structures	60	60	passed	6 (six)	9	Dusan Malbaši	0
E215	Physics	60	60	passed	7 (seven)	9	Ljuba Budinski-Petković	0
E216	Fundamentals of Electrical Engineering	60	60	passed	6 (six)	9	Vera Bajović	0
E217	Computer Architecture	60	60	passed	7 (seven)	9	Miroslav Hajduković	0
EJ12	English Language – Basic Course	45	0	passed	6 (six)	3	Branislava Licen	1
EJ2L	English Language – Intermediate Course	45	0	passed	6 (six)	3	Ivana Mirovic	1
E221	Mathematical Analysis 2	60	60	passed	7 (seven)	9	Mila Stojaković	0
E222	Electronics	60	60	passed	7 (seven)	9	Veljko Malbaša	0
E223	Object Programming	60	60	passed	8 (eight)	9	Dusan Malbaši	0
E224	Probability and Stochastic Processes	30	30	passed	6 (six)	6	Mila Stojaković	0
E225	Operating Systems	60	60	passed	9 (nine)	8	Miroslav Hajduković	0
E226	Automatic Control Systems	60	60	passed	6 (six)	8	Filip Kulić, Dusan Petrovački	0
E227	Computer Systems Logical Design I	60	60	passed	7 (seven)	8	Nikola Teslić	0
E251	Sociological Aspects of Technical Development	30	0	passed	6 (six)	3	Radoje Radivojević	0
E230	Computer Systems Logical Design 2	60	60	passed	7 (seven)	8	Vladimir Kovacevic	0
E232	Modeling and Simulation	30	30	passed	7 (seven)	8	Aleksandar Erdeljan	0
E235	Information Systems and Software Engineering Fundamentals	30	60	passed	8 (eight)	6	Branko Perić	0
E238	Computer Networks Fundamentals 1	30	30	passed	8 (eight)	4	Branislav Atlagic	1
E240	DSP Algorithm and Structure Fundamentals 1	60	60	passed	8 (eight)	4	Dragan Kukolj	1
E237	Methods of Optimization	60	60	passed	8 (eight)	8	Zoran Jelčić	0
E2381	Computer Networks Fundamentals 2	30	30	passed	8 (eight)	4	Branislav Atlagic	1
E2401	DSP Algorithm and Structure Fundamentals 2	30	30	passed	8 (eight)	4	Dragan Kukolj	1
E244	Selected Chapters in Physical Architecture Design	45	45	passed	10 (ten)	6	Vladimir Kovacevic	1
E23A	Real-Time System Software	60	60	passed	7 (seven)	8	Miroslav Popovic	1
RT44	DSP Architectures and Algorithms 1	60	45	passed	8 (eight)	7	Nikola Teslić	1
RT50	Television Set and Image Processing Software	60	45	passed	9 (nine)	7	Nikola Teslić	1
RT41	Inter Computer Communication and Computer Networks 1	45	60	passed	8 (eight)	5	Miroslav Popović	1
RT45	Real-Time Software 1	30	30	passed	9 (nine)	4	Branislav Atlagic	1
RT49A	Real-Time Software 2	30	30	passed	9 (nine)	4	Branislav Atlagic	1
RT52	Dedicated Computer Structures Design 1	45	45	passed	10 (ten)	6	Branislav Atlagic	1
RT43	Engineering of Computer Based Systems (ECBS Design)	45	45	passed	7 (seven)	5	Dragan Kukolj	1
RT46	DSP Architectures and Algorithms 2	45	45	passed	10 (ten)	4	Dragan Kukolj	1
E235P	Professional Practice	0	45	passed	3	Branislav Atlagic	0	
E248R	Bachelor Thesis	75	75	passed	10 (ten)	15	Miodrag Terzinac	0

Note: letter O – denotes an obligatory course; letter I – denotes an optional course

Bachelor thesis topic: Optimization of Huffman Encoder for Intel Based Platforms

Bachelor thesis professor (supervisor): Miodrag Terzinac

Bachelor thesis defence date (day/month/year): 23/07/2010

Average grade: 7.60 Number of ECTS credits obtained through the study programme: 240

1. The student completed the following courses/activities not mandatory in the study programme for obtaining the Diploma:

No.	Course/ Activity	Number of classes	Faculty	Grade	ECTS	Teacher
1	--	--	--	--	--	--
2	--	--	--	--	--	--

Total number of ECTS credits obtained: 240

Grade	Grade description	Total number of points expressed in percentages
10	Acquisition, reproduction and creative application of the whole subject matter	95-100
9	Acquisition, reproduction and application of the whole subject matter	85-94
8	Reproduction of the whole and application of the subject matter to a certain extent	75-84
7	Reproduction of the whole subject matter	65-74
6	Reproduction of the subject matter to a certain extent	55-64

DIPLOMA SUPPLEMENT UNDERGRADUATE ACADEMIC STUDIES

5. INFORMATION ON THE FUNCTION OF THE QUALIFICATION:

5.1 Access to further study:

- Graduate academic Master studies (only if the total sum of ECTS credits obtained through the undergraduate academic studies and graduate academic Master studies is not lower than 300);
- Specialist professional studies lasting one year and worth at least 60 ECTS credits
- Specialist professional studies lasting two years and worth at least 120 ECTS credits

5.2 Professional status (if applicable):

A person holding an undergraduate degree in engineering and the legally protected title of Bachelor in Engineering is entitled to perform professional work in those fields of engineering for which the qualification is issued.

6. ADDITIONAL INFORMATION:

6.1 Additional information:

1. Additional information on the institution

Certificate: ISO 9001:2000

2. Higher education institution accreditation:

Accreditation of the scientific and research activities of the Faculty 19/02/2007 Decision No. 021-01-61/22
Accreditation of the higher educational activities of the Faculty 12/04/2008 Decision No. 612-00-01428/2007-04
Accreditation of the study programme 19/05/2008 Decision No. 612-00-01428/25/2007-04

3. Additional information on the holder of qualification

A. Enrolment after completing secondary school:

Secondary school: Secondary Technical School, Kikinda
Duration: 4 years; Completed: 2004/05 academic year; Performance: 38.78 points.
Entrance examination: 1) Mathematics Performance: 30.00 points.

Overall number of points for access: 68.78
Candidates are ranked on the basis of their performance in the secondary school (minimum 18 points, maximum 40 points) and their performance at the entrance examination (maximum 40 points). Candidates can be enrolled within the enrolling quota.

B. Transfer from another Faculty:

Name and location of Faculty: -

C. Enrolment after completing Polytechnic School/Faculty:

Name and location of Polytechnic School/Faculty: -

D. The student achieved the following results at university student competitions:

No.	Competition	Subject	Achievement
1.	-	-	-

E. Other activities:

-

6.2 Further information sources:

1. About the institution: www.ftn.uns.ac.rs; www.uns.ac.rs; www.mps.sr.gov.yu; www.emis-nanic.net

2. About the candidate: Registrar's Office at the Faculty of Technical Sciences

3. Information on the study programme (the curriculum):

The study programme of the undergraduate academic-bachelor studies (the curriculum) Electrical and Computer Engineering, year 2009
- , Registrar's Office at the Faculty of Technical Sciences.

7. CERTIFICATION OF THE SUPPLEMENT

This Diploma Supplement is valid only if submitted with the original Diploma No. 012-B-100E issued by the University of Novi Sad, Faculty of Technical Sciences, Novi Sad.

7.1 No.:

Date:

7.3 Authorized person

BS-012-100E-B000353

27/03/2010

1) Dean: Prof. Ilija Čosić, Ph.D.

2) Rector: Prof. Miroslav Vesković, Ph.D.

7.2 Signature:

1)

7.4 Official stamp or seal:

2)

1)

2)

Procedure for introducing the study program at University of Novi Sad

What does the average of grade in view of ECTS really show?

Illustrative example: Undergraduate Academic Studies of Electrical and Computer Engineering

$$\text{Coefficient of ECTS}(K_{\text{ECTS}}) = \text{ECTS} \times \frac{\text{Grade}}{10}$$

Code	Course name	ECTS	STUDENT I		STUDENT II	
			Grade	K_{ECTS}	Grade	K_{ECTS}
E212	Mathematical Analysis 1	9	10	9	6	5,4
E213	Discrete Mathematics and Linear Algebra	9	10	9	6	5,4
E214	Programming Languages and Data Structures	9	10	9	6	5,4
E215	Physics	9	10	9	6	5,4
E216	Fundamentals of Electrical Engineering	9	10	9	6	5,4
E217	Computer Architecture	9	10	9	6	5,4
EJ1Z	English Language – Basic Course	3	6	1,8	10	3
EJ2L	English Language – Intermediate Course	3	6	1,8	10	3
E221	Mathematical Analysis 2	9	10	9	6	5,4
E222	Electronics	9	10	9	6	5,4
E223	Object Programming	9	10	9	6	5,4
E224	Probability and Stochastic Processes	6	6	3,6	10	6
E225	Operating Systems	8	10	8	6	4,8
E226	Automatic Control Systems	8	10	8	8	6,4
E227	Computer Systems Logical Design 1	8	6	4,8	6	4,8
E251	Sociological Aspects of Technical Development	3	6	1,8	10	3
E230	Computer Systems Logical Design 2	8	10	8	6	4,8
E232	Modelling and Simulation	8	10	8	6	4,8
E235	Information Systems and Software Engineering Fundamentals	6	10	6	8	4,8
E22B	Computer Networks Fundamentals 1	4	6	2,4	10	4

E240	DSP Algorithm and Structure Fundamentals 1	4	6	2,4	10	4
E237	Methods of Optimization	8	8	6,4		0
E23B1	Computer Networks Fundamentals 2	4	6	2,4	10	4
E2401	DSP Algorithm and Structure Fundamentals 2	4	6	2,4	10	4
E244	Selected Chapters in Physical Architecture Design	6	6	3,6	8	4,8
E23A	Real-Time System Software	8	8	6,4	8	6,4
RT44	DSP Architectures and Algorithms 1	7	10	7	8	5,6
RT50	Television Set and Image Processing Software	7	10	7	8	5,6
RT41	Inter Computer Communication and Computer Networks 1	5	6	3	10	5
RT49	Real-Time Software 1	4	6	2,4		0
RT49A	Real-Time Software 2	4	6	2,4	10	4
RT52	Dedicated Computer Structures Design 1	6	6	3,6	10	6
RT43	Engineering of Computer Based Systems (ECBS Design)	5	6	3	10	5
RT46	DSP Architectures and Algorithms 2	4	6	2,4	10	4
E23SP	Professional Practice	3	6	1,8	10	3
E24BR	Bachelor Thesis	15	10	15	6	9
\sum_{ESPB}		240		206,40		168,40
Average of grade*			8,00		8,00	

$$\text{Coefficient of students' workload}(K_{\text{WL}}) = \frac{\sum K_{\text{ECTS}}}{\sum \text{ECTS}} \times 100$$

Student I $K_{\text{WL}} = 86\%$

Student II $K_{\text{WL}} = 70\%$

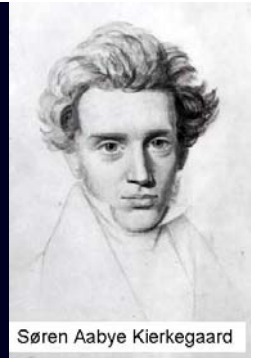
* Note that both students have the same average rating



Expected developments:

- *Improving suitability of ECTS models in evaluating necessary workload.*
- *Balance between ECTS allocated to the courses and real student workload should be reconsidered.*
- *The increase of student participation and influence in this processes and continual evaluation of student work.*
- *Strengthening international dimension of the third cycle/joint and double degree programs with partner universities.*
- *Learning outcomes must be verifiable claims of expressing knowledge, understanding, capacity for implementation, analysis, synthesis, evaluation, etc.*
- *Learning outcomes contain two essential elements:*
 - *To define the threshold of knowledge (the minimum necessary requirements for passing the exam).*
 - *A brief description of the typical knowledge (the expected level of achievement of successful students).*

"Life can be understood only looking backwards, but it is just LOOKING AHEAD to live."



Søren Aabye Kierkegaard



Paradigm:
"Student in the center of the learning process"
has become a reality.

THANK YOU
FOR YOUR
ATTENTION