



UNIVERSITY OF NOVI SAD

FACULTY OF TECHNICAL SCIENCES 21000 NOVI SAD, TRG DOSITEJA OBRADOVIĆA 6



Study Programme Accreditation

MASTER ACADEMIC STUDIES

Power Software Engineering

STUDY PROGRAMME ACCREDITATION MATERIAL:

POWER SOFTWARE ENGINEERING

MASTER ACADEMIC STUDIES

Novi Sad

2012.

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Programme name	Power Software Engineering
Independent higher education institution where the programme is being executed	University of Novi Sad
Higher education institution where the programme is being executed	Faculty of Technical Sciences
Educational-scientific/educational-art field	Technical-Technological Science
Scientific, professional or art field	Electrical and Computer Engineering
Type of studies	Master Academic Studies
Study scope, expressed in ECTS	60
Academic degree, abbreviation	Master in Electrical and Computer Engineering, M.El.Comp.Eng.
Study length	1
Programme implementation starting year	
Future course implementation starting year (for new programme)	2013
Number of students attending this programme	0
Planned number of students to be enrolled in this programme	32
Programme approval date (state the approval issuer)	14.11.2012 - Science Education Council 29.11.2012 - University of Novi Sad Senate
Programme language	Serbian, English
Programme accreditation year	
Web address containing programme information	http://www.ftn.uns.ac.rs



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MASTER ACADEMIC STUDIES

Power Software Engineering

Standard 00. Introduction

The study program of Master Academic Studies of Power Software Engineering represents the continuation of the corresponding study program of Undergraduate Academic Studies. It has been formed on the basis of long-lasting development of the study programs of Power, Electronic and Telecommunication Engineering and Computing and Control Engineering at the Faculty of Technical Sciences in Novi Sad. It is the result of the need for more profound research of the problem of design and development of specialized software for systems representing the functioning base of the society in general and the need for providing the education to the research and science oriented people as a potential resource for the work in the field in question.

Power Software Engineering is the field of studies intended for students who are interested, within their future professional orientation, in developing software for planning, organization, managing, monitoring and control of power systems and who have special talents and tendency to cultivate their research competence in the field in question.

Unlike the study programs dealing with the computer science in general, the Power Software Engineering applies a domain oriented approach with the intention to use the properties and problems of power systems as a context to introduce the advanced methods and techniques of software development. In this way, a detailed insight in the problems of software engineering in general is obtained, but at the same time, profound knowledge of the specifics of designing specialized software for power systems is acquired.

The study program of Power Software Engineering is a result of practical needs – lack in experts qualified for development of specialized software which has become a necessity in a well-functioning modern society. This study program at the level of Master Academic Studies provides the students graduated from the Undergraduate Academic Studies with the possibility, upon opting for the subjects of interest, to further their practical knowledge into skills necessary for the work in target area of application and to train to become research oriented professionals in their field of expertise.



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Power Software Engineering

Standard 01. Programme Structure

The name of the study program is Power Software Engineering. The academic title earned is Master in Electrical and Computer Engineering. The outcome of the learning process is theoretical knowledge, practical skills and ability of analytical and synthetic thinking, providing Master Engineers of this professional orientation with the possibility of independent research work in their field of expertise. The application of such acquired knowledge and skills to the problems occurring in the field of expertise enables not only the successful professional activity, but also the continuance of education at the level of doctoral studies.

Requirements for the enrolment in the study program are the graduation from Undergraduate Academic Studies in the corresponding field and passing of the entrance exam which carries 60 points and the exam is considered passed if the candidate gained at least 14 points.

All the subjects at one-year Master Academic Studies of Power Software Engineering are optional and enable students to shape their studies in a specific way, according to their personal inclination and wishes.

The teaching methods are lectures, auditory, calculation and computer practice. Special forms of teaching activities are homework, seminar papers, projects – all intended for the practical case studies in the corresponding research field. Special attention is paid to individual work with students in the form of mentoring activities and consultations. The number of acquired ECTS is formulated on the basis of a unique methodology and shows the engagement of students in all forms of teaching activities. Studies are considered finished when a student fulfills all its obligations prescribed by the study program, passes the exams, writes and defends the final – Master paper and acquires at least 60 ECTS.



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Standard 02. Programme Objectives

The purpose of the study program of Power Software Engineering is educating the students for the profession of Master in Electrical and Computer Engineering in accordance with the society's needs.

The study program of Power Software Engineering is conceived so that holders of Master Degree in Electrical and Computer Engineering acquire the competence in the field of research oriented approach to software development in general, as well as the software for power systems, in this way providing the basis for social justification and usefulness of this program and its perspective. The Faculty of Technical Sciences in Novi Sad has defined basic assignments and goals in order to provide the education to highly competent resources in the field of engineering, technology, organization, management and making of foundation for scientific and research undertakings in the fields in question. The purpose of the study program of Power Software Engineering is in full compliance with the mentioned basic assignments and goals of the Faculty of Technical Sciences in Novi Sad.

The realization of such a conceived study program means the education to holders of Master Degree in Electrical and Computer Engineering and providing them with the scientific competence in line with both European and world educational standards.



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Power Software Engineering

Standard 03. Programme Goals

The goal of the study program of Power Software Engineering is the acquisition of competence and research and science oriented academic skills in the field of modern information technologies, as well as specific practical skills required for design and development of software for power systems. This includes fostering of creativity in the problem solving process and the ability of critical thinking, but also the encouragement of team work on the realization of research projects with the application of adequate scientific methods.

The goal of the study program is to offer the education to researchers with the required theoretical and practical knowledge in all the needed disciplines, the ability of conducting the research in those disciplines, as well as specific skills in the application of relevant technologies in those disciplines, based on expert knowledge and understanding of engineering laws regulating the mentioned disciplines.

Specific goals, which are in accordance with the goals of Master Academic Studies at the Faculty of Technical Sciences in Novi Sad, are to raise awareness of the need for constant personal advancement as well as to foster the ability of presenting and communicating one's knowledge and results not only to colleagues, but also to both professional and general public. Another goal is to raise awareness of the problems and responsibilities of professional practice among which are the questions of safety, ethics and ecology and social growth as well.



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Power Software Engineering

Standard 04. Graduates` Competencies

Upon completing the study program of Power Software Engineering, holders of Master Degree in Electrical and Computer Engineering are capable of inspecting the professional problems, analyzing the problems, synthesizing the solutions to the problems, making critical evaluation of advantages or disadvantages of the solutions, as well as making expert decisions. They have the capacity to continue with their education at the level of doctoral studies.

Specific skills – knowledge and skills of holders of Master Degree in Electrical and Computer Engineering, acquired in this study program include expert knowledge and understanding of disciplines relevant for this study program as the basis for successful dealing with practical problems with the application of appropriate methods and procedures. The ability to relate the basic theoretical knowledge in various fields with their practical application is specially emphasized. Holders of Master Degree in Electrical and Computer Engineering are capable of formulating, elaborating and presenting of the results of their work in an appropriate way.

Holders of Master Degree in Electrical and Computer Engineering have the competence to apply the acquired knowledge and skills in the practice and to continually make innovations to the knowledge and skills. They also have the competence to generate new expert information as well as the information resulting from scientific and research work and to apply them in their own field of work. In addition, they become qualified for any cooperation in local and international social, public and professional environment.

Finally, holders of Master Degree in Electrical and Computer Engineering obtain a research potential and are capable of participating in team work in which case they can apply the principle of professional and business ethics.



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Power Software Engineering

Standard 05. Curriculum

The curriculum of Master Academic Studies of Power Software Engineering meets all the set requirements. The standard requiring that the optional subjects are included with at least 30% of ECTS credits is fulfilled. There are only optional subjects in the structure of the study program that enable the students to pursue their inclinations in the field they opted for.

All the subjects are one-semester and carry a certain number of ECTS credits where a point approximately corresponds to 30 classes of students' activities. The sequence of subjects within the study program is such that the knowledge required for the subjects that follow is acquired in the preceding subjects. The curriculum includes descriptions of each subject with the name and type of subject, year and semester of the studies, number of ECTS credits, lecturer's name, requirements for passing of the exams, objective of the subjects with anticipated outcome and competence, content of the subjects, teaching methods, knowledge verification and evaluation, recommended literature and other information.

The study program is in accordance with European standards regarding the entrance requirements, duration of studies, diploma acquiring and the concept of studies.

The integral part of the curriculum of the study program of Power Software Engineering is an internship – practical work with the duration of 45 classes which is completed in appropriate scientific and research oriented institutions, in organizations performing innovations related activities, in organizations giving infrastructure related support to innovation activities and in commercial organizations and public utilities.

The students finish the studies by writing a final – Master paper consisting of theoretical and methodology preparation necessary for more profound understanding of the expert field the paper relates to and completing a final – Master paper representing the application of acquired knowledge and skills in a concrete research work.

Prior to the defense of the final – Master paper the students pass the theoretical and methodology base before the mentor to the paper. The final grade of the final – Master paper is derived from the grade of theoretical and methodology preparation and the paper grade formed on the basis of the quality of the submitted paper, its presentation and answers given to the questions of the committee present at the defense of the paper consisting of at least 3 lecturers. At least one lecturer is a lecturer from another study program or department/faculty/university whose expert field is in accordance with the scientific field of this study program.

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Table 5.2 Course specification

Course:		Multimedia Systems				
Course id:	E2505					
Number of ECTS:	6					
Teachers:	Ivetić V. Dragan, Suvajdžin Rakić B. Zorica, Mihajlović R. Dragan					
Course status:	Elective					
Number of active teaching classes (weekly)						
Lectures:	Practical classes:	Other teaching types:	Study research work:	Other classes:		
3	0	3	0	0		
Precondition courses		None				
1. Educational goal: Enabling students to collect, handle, archive, programme, synchronize and present multimedia data flow in the network environment.						
2. Educational outcomes (acquired knowledge): Acquired knowledge and skills are used for development/use of software/systems of expressed multimedia.						
3. Course content/structure: Multimedia (concepts, characteristics and media data flow). Characteristics of audio/video/image-graphic media (music-MIDI; speech; video-TV and HDTV / 3D). An overview of standards for compression and optical storage (standard algorithms; JPEG2000 and MPEG 1, 2, 4, 7 and 21; CD DA-ROM-WO-RW; DVD; holograph). MM communication systems (timer-user-control space and CSCW; requirements and limitations of the protocol on presentation-application and network-transportation ISO-OSI levels) and videoconference. MM data base (structures and operations). Synchronization of MM data (four-layer reference model and distributed systems). Program abstraction, tools and applications (programme and script languages; authoring systems and MM kiosk).						
4. Teaching methods: Lectures, Computer Practice, Consultations. The course is organized in 2 wholes which are checked in the form of 2 tests during the lectures. During Practice, multimedia contents are presented and manipulated on programs (DirectX or OpenGL) or authoring (Flash) levels, creating simple systems for exchange of multimedia contents in real time. The quality of the Practice work is evaluated. Successfully solved exercises are the examination prerequisites. The examination is taken in the written form. Points won at the examination, tests and prerequisites are added to form the final grade.						
Knowledge evaluation (maximum 100 points)						
Pre-examination obligations		Mandatory	Points	Final exam	Mandatory	Points
Complex exercises		Yes	50.00	Theoretical part of the exam	Yes	30.00
Test		Yes	10.00			
Test		Yes	10.00			
Literature						
Ord.	Author	Title		Publisher	Year	
1,	D. Ivetić	Osnovi interaktivnih sistema sa elementima računarske grafike i multimedije, u pripremi			2012	
2,	R. Steinmetz, K. Nahrstedt	Multimedia: Computing, Communications & Applications		Pretince Hall	1995	



Study Programme Accreditation
MASTER ACADEMIC STUDIES Power Software Engineering

Table 5.2 Course specification

Course:	Fuzzy Systems					
Course id:	E2511					
Number of ECTS:	6					
Teacher:	Obradović J. Đorđe					
Course status:	Elective					
Number of active teaching classes (weekly)						
Lectures:	Practical classes:	Other teaching types:	Study research work:	Other classes:		
3	0	3	0	0		
Precondition courses None						
1. Educational goal: Students become familiar with the concepts, techniques and chosen examples of the application of the fuzzy approach.						
2. Educational outcomes (acquired knowledge): Students acquire knowledge in the concepts taken from the fuzzy sets and fuzzy logic theory. Besides, they become familiar with certain approaches and methods of application.						
3. Course content/structure: Fuzzy sets. Fuzzy logic. Probability theory. Approximation decision making. Fuzzy aggregation operators, fuzzy relations, fuzzy clustering. Application in decision making, data search, shape recognition, control.						
4. Teaching methods: Lectures. Computer practice. Tutorial work. The practical part of the course is evaluated through laboratory work by solving obligatory tasks. Students are encouraged to do additional tasks at their own will as well. The tasks are graded. A part of the subject matter that forms a unit can be taken as a partial exam-colloquium (from 2 to 4). The partial exam is a part of the examination. The student can take the next partial exam only if they have gathered at least 30% of points at the previous partial exam. Partial exams are taken in the written form. The final part of the examination is an oral exam. The grade at the exam is formed by adding all the points a student has gathered during the course: by attending the lectures, completing the obligatory tasks, papers, passing the partial exams and the final examination.						
Knowledge evaluation (maximum 100 points)						
Pre-examination obligations		Mandatory	Points	Final exam	Mandatory	Points
Computer exercise attendance		Yes	5.00	Theoretical part of the exam	Yes	30.00
Homework		Yes	2.00			
Lecture attendance		Yes	3.00			
Project		Yes	25.00			
Project task		Yes	15.00			
Term paper		Yes	20.00			
Literature						
Ord.	Author	Title		Publisher	Year	
1,	G. J. Klir, B. Yuan	Fuzzy Sets and Fuzzy Logic		Prentice Hall, 1995, ISBN: 0131011715	1995	
2,	Kwang H Lee	First Course on Fuzzy Theory and Applications		Springer-Verlag Berlin and Heidelberg GmbH & Co.K	2004	

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Table 5.2 Course specification

Course:		Database Management Systems				
Course id:	E2517					
Number of ECTS:	6					
Teacher:	Luković S. Ivan					
Course status:	Elective					
Number of active teaching classes (weekly)						
Lectures:	Practical classes:	Other teaching types:	Study research work:	Other classes:		
3	0	3	0	0		
Precondition courses		None				
1. Educational goal:						
Advanced education of students in the field of Database Management Systems (DBMS) applications, and database (DB) administration, with the possibility of their easy involvement in industry projects in the field of database system development.						
2. Educational outcomes (acquired knowledge):						
Acquiring of skills and knowledge necessary for the application of DBMSs in practice and database administration.						
3. Course content/structure:						
Features and tasks of DBMSs. Physical architecture of a DBMS. Memory management in a DBMS. File management in a DBMS. Physical database organization and performance management. Techniques for the usage of views, sequence generators and indexes at the DB server. Advanced SQL capabilities for database updates and queries. Query optimizers. Mechanisms for providing DB security and safety. DB backup, restore and recovery. Implementation of distributed databases. Software tools for database administration.						
4. Teaching methods:						
Teaching is performed through lessons, oral and computer exercises (in the computer classroom), as well as consultations. Through the teaching process, students are constantly motivated to an intensive discussion, problem oriented reasoning, independent study work and active participation in the whole lecturing process. The prerequisite to enter final exam is to complete all the pre-exam assignments by earning at least 30 points.						
Knowledge evaluation (maximum 100 points)						
Pre-examination obligations		Mandatory	Points	Final exam		
				Mandatory	Points	
Complex exercises		Yes	10.00	Oral part of the exam Yes 30.00		
Complex exercises		Yes	10.00			
Complex exercises		Yes	10.00			
Complex exercises		Yes	10.00			
Presentation		Yes	10.00			
Term paper		Yes	20.00			
Literature						
Ord.	Author	Title		Publisher	Year	
1,	Date C. J.	An Introduction to Database Systems (8th Edition)		Addison Wesley	2004	
2,	Ramakrishnan R., Gehrke J.	Database Management Systems		McGraw Hill, Inc.	2000	
3,	Mogin P, Luković I, Govedarica M	Principi projektovanja baza podataka		FTN Izdavaštvo	2004	
4,	Grupa autora	Priručnici za obezbeđenje administriranja izabranim SUBP			2005	
5,	Bryla Bob, Loney Kevin	Oracle Database 11g DBA Handbook		Oracle Press	2007	
6,	Ross Mistry	Microsoft SQL Server 2008 Management and Administration		Sams Publishing	2009	

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Table 5.2 Course specification

Course:		<h2 style="margin: 0;">Parallel and distributed architectures</h2>				
Course id:	E2529					
Number of ECTS:	6					
Teacher:	Hajduković P. Miroslav					
Course status:	Elective					
Number of active teaching classes (weekly)						
Lectures:	Practical classes:	Other teaching types:	Study research work:	Other classes:		
3	0	3	0	0		
Precondition courses		None				
1. Educational goal: Preparation of students to use parallel and distributed computer architectures.						
2. Educational outcomes (acquired knowledge): Ability of students to use parallel and distributed computer architectures.						
3. Course content/structure: Parallelism classification. Parallelism abstractions. Parallelism expression ways and tools. Parallel and distributed computer architecture case studies and their programming characteristics.						
4. Teaching methods: Lectures, computer practice. Consultations. Pre exam assignments include four tests and one course project. The final examination test the theoretical part of the course material. The number of points for obtaining a signature is 30.						
Knowledge evaluation (maximum 100 points)						
Pre-examination obligations		Mandatory	Points	Final exam	Mandatory	Points
Project		Yes	30.00	Theoretical part of the exam	Yes	30.00
Test		Yes	10.00			
Test		Yes	10.00			
Test		Yes	10.00			
Test		Yes	10.00			
Literature						
Ord.	Author	Title		Publisher	Year	
1,	G.R. ANDREWS	Foundation of Multithreaded, Parallel and Distributed Programming		Addison-Wesley	2000	
2,	Y. C. Lin, L. Snyder	Principles of parallel programming		Pearson/Addison-Wesley	2008	

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Table 5.2 Course specification

Course:		<h2 style="margin: 0;">Applied algorithms in power systems</h2>				
Course id:	ESI024					
Number of ECTS:	6					
Teachers:	Čapko Lj. Darko, Nimrihter D. Miroslav, Pavlica N. Vladimir					
Course status:	Elective					
Number of active teaching classes (weekly)						
Lectures:	Practical classes:	Other teaching types:	Study research work:	Other classes:		
3	0	2	0	1		
Precondition courses		None				
1. Educational goal:						
The aim of the course is the detailed knowledge of the algorithms for solving optimization problems of software applications in power systems.						
2. Educational outcomes (acquired knowledge):						
The outcome is competence to solve some optimization problems in the power system applications.						
3. Course content/structure:						
Optimization problems of software applications in the power system: distributed data model, load balancing, workflow management, the optimal creation of power system network diagram, coloring of power objects for the client applications, etc. Static and dynamic algorithms - characteristics, criteria. Characteristics of graphs that describe the electric power network. Development of algorithms for these problems: graph algorithms (multilevel,...), evolutionary algorithms, etc.						
4. Teaching methods:						
Teaching is conducted through the lectures and computer practice. Throughout the computer practice student is obliged to complete practically oriented tasks.						
Knowledge evaluation (maximum 100 points)						
Pre-examination obligations		Mandatory	Points	Final exam	Mandatory	Points
Project		Yes	30.00	Oral part of the exam	Yes	30.00
Test		Yes	10.00			
Test		Yes	10.00			
Test		Yes	10.00			
Test		Yes	10.00			
Literature						
Ord.	Author	Title		Publisher	Year	
1,	T. H. Cormen, C. E. Leiserson, R. L. Rivest, C. Stein	Introduction to Algorithms, Third Edition		MIT Press	2009	
2,	Christos H. Papadimitriou, Kenneth Steiglitz.	Combinatorial optimization: algorithms and complexity		Prentice Hall	1998	
3,	Vazirani, V.V.	Approximation Algorithms		Springer	2001	

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Table 5.2 Course specification

Course:		<h2 style="margin: 0;">Smart grid applications in Cloud</h2>				
Course id:	ESI032					
Number of ECTS:	6					
Teachers:	Vukmirović M. Srđan, Gavrić M. Milan					
Course status:	Elective					
Number of active teaching classes (weekly)						
Lectures:	Practical classes:	Other teaching types:	Study research work:	Other classes:		
3	0	2	0	1		
Precondition courses		None				
1. Educational goal:						
The aim of this course is to give students specific knowledge in engineering of Smart Grid applications in Cloud.						
2. Educational outcomes (acquired knowledge):						
Students passing this exam will have capacities for realization of Cloud systems in the Smart Grid.						
3. Course content/structure:						
In this exam candidates will learn specific Smart Grid software components and implementation of such components in Cloud environment: Shared memory; Pub/Sub; Replication; Load balancing; Distributed Logging; Distributed Alarming; Resource management and auto-scaling; HPC in Cloud; Real time in Cloud; Communication protocols with field devices; Fault tolerance; Availability etc.						
4. Teaching methods:						
Teaching is conducted through lectures and laboratory exercises. The lectures have a theoretical focus with a number of characteristic examples enforcing easier understanding. The laboratory exercises are linked to the lectures with more practical examples. Students are required to complete practical tasks during laboratory exercises. Apart from lectures and lab exercises, the candidates will have consultations with their professors.						
Knowledge evaluation (maximum 100 points)						
Pre-examination obligations		Mandatory	Points	Final exam		
		Mandatory	Points			
Project	Yes	30.00	Oral part of the exam		Yes	30.00
Test	Yes	10.00				
Test	Yes	10.00				
Test	Yes	10.00				
Test	Yes	10.00				
Literature						
Ord.	Author	Title		Publisher	Year	
1,	Microsoft Power and Utilities Group	Smart Energy Reference Architecture		Microsoft Press	2009	
2,	Srđan Vukmirović	Cloud zasnovani Smart Grid sistemi – skripta		-	2013	

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Table 5.2 Course specification

Course:		<h2 style="margin: 0;">Visualization techniques in power systems</h2>				
Course id:	ESI036					
Number of ECTS:	6					
Teachers:	Ivetić V. Dragan, Gavrić M. Milan					
Course status:	Elective					
Number of active teaching classes (weekly)						
Lectures:	Practical classes:	Other teaching types:	Study research work:	Other classes:		
3	0	2	0	1		
Precondition courses		None				
1. Educational goal:						
The objective of this course is to acquire the knowledge to visualize the state of power grid systems.						
2. Educational outcomes (acquired knowledge):						
Course outcomes are mastering the knowledge and skills necessary for selection (development) of appropriate real-time visualization technique of power grid systems (and other systems with modest characteristics) at a given level of detail.						
3. Course content/structure:						
Basic concepts and general principles of data visualization techniques in power grid. Techniques and associated algorithms for the visualization of linear and hierarchical data structure, multidimensional metadata and huge collections of text and objects. Special attention is given to techniques and algorithms for the visualization of networks and graphs - adjacency matrix by forcing a predetermined spatial positions (linear, circular, mesh and geographic) or layered drawing. Techniques and algorithms are illustrated with examples using various display options (color depth and resolution) as well as the context of use (personal use and/or group/audience, observations and/or complete control, with or without multimedia streams).						
4. Teaching methods:						
Teaching is conducted through lectures and computer lab exercises. During the computer practice student is required to complete practically oriented tasks.						
Knowledge evaluation (maximum 100 points)						
Pre-examination obligations		Mandatory	Points	Final exam		
Complex exercises		Yes	50.00	Oral part of the exam		
Test		Yes	10.00			
Test		Yes	10.00			
Literature						
Ord.	Author	Title		Publisher	Year	
1,	Dragan Ivetić	Vizuelizacija podataka - skripta		FTN Novi Sad	2013	
2,	Ward, M. and Grinstein, G. and Keim, D.	Interactive Data Visualization: Foundations, Techniques, and Application		A K Peters	2010	

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Table 5.2 Course specification

Course:		Simulation of Power Grid critical mission systems				
Course id:	ESI025					
Number of ECTS:	6					
Teachers:	Atlagić S. Branislav, Nimrihter D. Miroslav, Pavlica N. Vladimir					
Course status:	Elective					
Number of active teaching classes (weekly)						
Lectures:	Practical classes:	Other teaching types:	Study research work:	Other classes:		
3	0	2	0	1		
Precondition courses		None				
1. Educational goal:						
The aim of the subject is detail study of advanced critical mission software systems applied in power grids.						
2. Educational outcomes (acquired knowledge):						
The outcome of the subject is acquiring knowledge, skills and capacities for active approach to tasks in critical mission software systems applied in power grids.						
3. Course content/structure:						
Application of SCADA/DCS systems in critical power and infrastructure systems. The main requirements related to designing and managing of this class systems. Introduction to the legal regulations governing use of computer technologies in this area. Reliability and availability of control system. Redundant structures. Security aspects. Expanding of the basic SCADA systems by subsystem for expert management in real time. Integration of control systems with GIS and decision support systems. Architecture of critical infrastructure control systems and control algorithms. Analysis of typical applications for: energy transport and distribution (electrical, gas, oil), complex industrial plants (refineries), traffic control. Analysis of actual examples.						
4. Teaching methods:						
Teaching is conducted through the lectures and computer practice. Throughout the computer practice student is required to complete practically oriented tasks.						
Knowledge evaluation (maximum 100 points)						
Pre-examination obligations		Mandatory	Points	Final exam	Mandatory	Points
Project		Yes	30.00	Theoretical part of the exam	Yes	30.00
Test		Yes	10.00			
Test		Yes	10.00			
Test		Yes	10.00			
Test		Yes	10.00			
Literature						
Ord.	Author	Title		Publisher	Year	
1,	S.Das, K.Kant, N.Zhang	Securing Cyber-Physical Critical Infrastructure		Morgan Kaufmann	2011	
2,	A.Murray, T.Grubesic	Critical Infrastructure - Reliability and Vulnerability		Springer	2007	
3,	R.Krutz	Securing SCADA Systems		Wiley Publishing	2006	

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Table 5.2 Course specification

Course:		<h2 style="margin: 0;">Simulation of power grid critical mission systems</h2>				
Course id:	ESI029					
Number of ECTS:	6					
Teachers:	Gavrić M. Milan, Pavlica N. Vladimir					
Course status:	Elective					
Number of active teaching classes (weekly)						
Lectures:	Practical classes:	Other teaching types:	Study research work:	Other classes:		
3	0	2	0	1		
Precondition courses		None				
1. Educational goal:						
The aim of the subject is detail study of methods for simulation of critical mission software systems applied in power grids.						
2. Educational outcomes (acquired knowledge):						
The outcome of the subject is capacity to design simulator of critical mission software systems applied in power grids.						
3. Course content/structure:						
Simulation environments for development and verification of application specific control code for SCADA systems implemented in critical mission power grids. Use and classification of SCADA simulation environments. Protocol simulators. Plant simulators: discrete and analog simulation – notion and characteristics. Dispatcher training simulators. Integration of Simulink code with SCADA simulator. Case studies of different real-world critical mission systems with stress on power systems.						
4. Teaching methods:						
Teaching is conducted through the lectures and computer practice. Throughout the computer practice student is required to complete practically oriented tasks.						
Knowledge evaluation (maximum 100 points)						
Pre-examination obligations		Mandatory	Points	Final exam	Mandatory	Points
Project		Yes	30.00	Oral part of the exam	Yes	30.00
Test		Yes	10.00			
Test		Yes	10.00			
Test		Yes	10.00			
Test		Yes	10.00			
Literature						
Ord.	Author	Title		Publisher	Year	
1,	B.Lipták	Process Control and Optimization		CRC Press	2006	
2,	J.Dabney; T.Harman	Mastering Simulink		Pearson/Prentice Hall	2004	
3,	S.Karris	Introduction to Simulink® with Engineering Applications		Orchard Publications	2006	

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Table 5.2 Course specification

Course:		<h2 style="margin: 0;">Advanced Power Grid Communication Protocols</h2>				
Course id:	ESI033					
Number of ECTS:	6					
Teachers:	Atlagić S. Branislav, Lendak I. Imre					
Course status:	Elective					
Number of active teaching classes (weekly)						
Lectures:	Practical classes:	Other teaching types:	Study research work:	Other classes:		
3	0	2	0	1		
Precondition courses		None				
1. Educational goal:						
The aim of the subject is detail study of advanced industrial communication protocols applied in power grids.						
2. Educational outcomes (acquired knowledge):						
The outcome of the subject is capacity to use software systems based on industrial communication protocols applied in power grids.						
3. Course content/structure:						
Industrial communications and networks applied in critical infrastructure systems. High security demands. Architecture and design of secured network structures. Smart grid communication standards. Detail study of IEC 61850, OPC and IEC 61850-2. AMI protocols. Protocols for controlling business and residential buildings.						
4. Teaching methods:						
Teaching is conducted through the lectures and computer practice. Throughout the computer practice student is required to complete practically oriented tasks.						
Knowledge evaluation (maximum 100 points)						
Pre-examination obligations		Mandatory	Points	Final exam	Mandatory	Points
Project		Yes	30.00	Oral part of the exam	Yes	30.00
Test		Yes	10.00			
Test		Yes	10.00			
Test		Yes	10.00			
Test		Yes	10.00			
Literature						
Ord.	Author	Title		Publisher	Year	
1,	C.Ozansoy	Modelling and Object Oriented Implementation of IEC 61850		Lambert	2010	
2,	Eric D. Knapp	Industrial Network Security		Syngress	2011	

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Table 5.2 Course specification

Course:		<h2 style="margin: 0;">Smart Grid security and safety</h2>				
Course id:	ESI037					
Number of ECTS:	6					
Teachers:	Lendak I. Imre, Pavlica N. Vladimir					
Course status:	Elective					
Number of active teaching classes (weekly)						
Lectures:	Practical classes:	Other teaching types:	Study research work:	Other classes:		
3	0	2	0	1		
Precondition courses		None				
1. Educational goal:						
The aim of this course is to familiarize the candidates with advanced concepts of secure and dependable power systems, with a special emphasis on Smart Grid systems.						
2. Educational outcomes (acquired knowledge):						
Candidates passing this exam will be capable of planning and implementing secure and dependable power systems within the Smart Grid.						
3. Course content/structure:						
A short history of known security breaches in Smart Grids. General security policy for improving the security and dependability of Smart Grids. External and internal security threats. Physical security of critical infrastructure systems. The Internet and its effect on the security and dependability of Smart Grids. Advanced mechanisms of intrusion detection and advanced defense mechanisms. Secure networks of Smart Meters. Legal aspects and consumer data privacy.						
4. Teaching methods:						
Teaching is conducted through lectures and laboratory exercises. The lectures have a theoretical focus with a number of characteristic examples enforcing easier understanding. The laboratory exercises are linked to the lectures with more practical examples. Candidates are required to complete practical tasks during laboratory exercises. Apart from lectures and lab exercises, the candidates will have face-to-face consultations with their professors.						
Knowledge evaluation (maximum 100 points)						
Pre-examination obligations		Mandatory	Points	Final exam	Mandatory	Points
Test		Yes	10.00	Coloquium exam	Yes	30.00
Test		Yes	10.00	Theoretical part of the exam	Yes	30.00
Test		Yes	10.00			
Test		Yes	10.00			
Literature						
Ord.	Author	Title		Publisher	Year	
1,	A.S.Tanenbaum, M.van Steen	Distributed Systems: Principles and Paradigms		Pearson	2002	
2,	R.J.Anderson	Security Engineering: A Guide to Building Dependable Distributed Systems		John Wiley & Sons	2008	
3,	C.F.Pfleeger, S.L.Pfleeger	Security in Computing		Prentice Hall	2006	

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Table 5.2 Course specification

Course:		Quality control and assurance of electric power software				
Course id:	ESI022					
Number of ECTS:	6					
Teachers:	Nimrihter D. Miroslav, Pavlica N. Vladimir, Varga D. Ervin					
Course status:	Elective					
Number of active teaching classes (weekly)						
Lectures:	Practical classes:	Other teaching types:	Study research work:	Other classes:		
3	0	3	0	0		
Precondition courses		None				
1. Educational goal: The aim of the subject is preparation to electric power software maintenance and quality control.						
2. Educational outcomes (acquired knowledge): The educational outcome is ability to take part in electric power software maintenance and quality control team.						
3. Course content/structure: Electric power software quality control and quality assurance. Electric power software maintenance and techniques (program comprehension, re-engineering and reverse engineering). Exploitation effectiveness of power engineering software.						
4. Teaching methods: The teaching is conducted through lectures and computer practice. During the practice classes students are required to perform practice oriented tasks.						
Knowledge evaluation (maximum 100 points)						
Pre-examination obligations		Mandatory	Points	Final exam	Mandatory	Points
Project		Yes	30.00	Theoretical part of the exam	Yes	30.00
Test		Yes	10.00			
Test		Yes	10.00			
Test		Yes	10.00			
Test		Yes	10.00			
Literature						
Ord.	Author	Title		Publisher	Year	
1,	I. Sommerville	Software Engineering, 9th Edition		Addison-Wesley	2007	
2,	Steve McConnell	Code Complete, 2nd Edition		Microsoft Press	2004	
3,	Frederick Phillips Brooks	The Mythical Man-Month: Essays on Software Engineering		Addison-Wesley	1995	

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Table 5.2 Course specification

Course:		<h2 style="margin: 0;">Distributed Software Architectures for Smart Energy Grids</h2>				
Course id:	ESI030					
Number of ECTS:	6					
Teachers:	Erdeljan M. Aleksandar, Nimrihter D. Miroslav, Pavlica N. Vladimir					
Course status:	Elective					
Number of active teaching classes (weekly)						
Lectures:	Practical classes:	Other teaching types:	Study research work:	Other classes:		
3	0	2	0	1		
Precondition courses		None				
1. Educational goal:						
The goal of this course is to acquire the necessary knowledge about the concepts and paradigms of distributed systems and their implementation in the power systems.						
2. Educational outcomes (acquired knowledge):						
Outcomes are the knowledge, skills and abilities necessary for understanding the complexity of distributed systems and solve practical engineering problems in power systems.						
3. Course content/structure:						
<p>Introduction: Smart Grid business and functional requirements. Smart Grid infrastructure requirements and challenges: scalable software platforms, information streaming from millions of smart meters, computational intensive applications, forecast power usage and respond to operational events, monitoring and control of energy assets for their optimal use. Data sources and models in Smart Grid: power grid data model, asset data, forecasting computational models, customer load model, dynamic pricing of power, etc. Services for Smart Grid systems. Logical architecture and interfaces of the Smart Grid. Processing and data flows: SCADA software, advanced DMS software, demand/response optimization services, stream data (from sensors and Smart Meters) processing, scheduling latency sensitive applications. Real-time, two-way communication between utilities and consumers. System-of-Systems architectures: Silo architecture, Integration using Enterprise Service Buses, Adapter Architecture, Architecture Based on Open Standard Service Mechanisms. Architectures based on centralized systems at utilities and Clouds. Reference architecture as the basis for development of the "integrated utility of the future". Security aspects: scalable data sharing and privacy preservation.</p>						
4. Teaching methods:						
Teaching is conducted through lectures and computer exercises. During the exercises the student is required to apply their knowledge in practice.						
Knowledge evaluation (maximum 100 points)						
Pre-examination obligations		Mandatory	Points	Final exam	Mandatory	Points
Project		Yes	30.00	Theoretical part of the exam	Yes	30.00
Test		Yes	10.00			
Test		Yes	10.00			
Test		Yes	10.00			
Test		Yes	10.00			
Literature						
Ord.	Author	Title		Publisher	Year	
1,	IEEE	IEEE Smart Grid		http://smartgrid.ieee.org/	1993	
2,	Andrew S. Tenenbaum, Maarten Van Steen	Distributed Systems, Principles and Paradigms		Pearson Education, inc.	2007	
3,	Smart Energy Reference Architecture	Microsoft Power and Utilities		Microsoft	2009	
4,	NIST	NIST Smart Grid		http://www.nist.gov/smartgrid/	2013	

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Table 5.2 Course specification

Course:		<h2 style="margin: 0;">Multi-tier applications development in Smart Grids</h2>				
Course id:	ESI034					
Number of ECTS:	6					
Teachers:	Čapko Lj. Darko, Pavlica N. Vladimir					
Course status:	Elective					
Number of active teaching classes (weekly)						
Lectures:	Practical classes:	Other teaching types:	Study research work:	Other classes:		
3	0	2	0	1		
Precondition courses		None				
1. Educational goal:						
The aim of the subject is detail study of multi-tier application development applied in Smart Grid systems.						
2. Educational outcomes (acquired knowledge):						
The outcome of the subject is capacity to develop multi-tier application in Smart Grids.						
3. Course content/structure:						
The architecture of software applications in Smart Grids: centralized and decentralized. Components in Smart Grids (OMS, DMS, GIS, EMS, CMS, etc.). Analysis of communication networks and types of communication between components. Development of complex multi-tier applications for the integration of components within the Smart Grid. Communication between the components of the Smart Grids. Standardization of the communication. Project: The development of complex multi-tier applications for the Smart Grids.						
4. Teaching methods:						
Teaching is conducted through the lectures and computer practice. Throughout the computer practice student is obliged to complete practically oriented tasks.						
Knowledge evaluation (maximum 100 points)						
Pre-examination obligations		Mandatory	Points	Final exam	Mandatory	Points
Project		Yes	30.00	Oral part of the exam	Yes	30.00
Test		Yes	10.00			
Test		Yes	10.00			
Test		Yes	10.00			
Test		Yes	10.00			
Literature						
Ord.	Author	Title		Publisher	Year	
1,	Fowler, Martin	Patterns of Enterprise Application Architecture		Addison Wesley	2002	
2,	Andrew S.Tanenbaum, Maarten Van Steen	Distributed systems: principles and paradigms		Pearson Prentice Hall	2002	
3,	James Momoh	Smart Grid – Fundamentals of Design and Analysis		John Wiley & Sons	2012	
4,	Janaka Ekanayake, i ostali	Smart grid : technology and applications		John Wiley & Sons	2012	
5,	IEEE	IEEE Smart Grid		http://smartgrid.ieee.org/	2013	

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Table 5.2 Course specification

Course:		<h2 style="margin: 0;">Service oriented architectures in Smart Grid</h2>				
Course id:	ESI038					
Number of ECTS:	6					
Teachers:	Lendak I. Imre, Nimrihter D. Miroslav, Pavlica N. Vladimir, Vukmirović M. Srđan					
Course status:	Elective					
Number of active teaching classes (weekly)						
Lectures:	Practical classes:	Other teaching types:	Study research work:	Other classes:		
3	0	2	0	1		
Precondition courses		None				
1. Educational goal:						
The aim of this course is to give students specific knowledge in engineering of Service oriented applicatons in Smart Grid.						
2. Educational outcomes (acquired knowledge):						
Students passing this exam will have experiences in in engineering of Service oriented applicatons in Smart Grid.						
3. Course content/structure:						
SOA in Smart Grid; Leveraging Best Practices from EAI and SOA; Message Oriented Middleware; Service Containers and Abstract Endpoints; ESB Service Invocations, Routing, and SOA; Protocols, Messaging, Custom Adapters, and Services; ESB Integration Patterns and Recurring Design Solutions.						
4. Teaching methods:						
Teaching is conducted through lectures and laboratory excercises. The lectures have a theoretical focus with a number of characteristic examples enforcing easier understanding. The laboratory excercises are linked to the lectures with more practical exmaples. Students are required to complete practical tasks during laboratory excercises. Apart from lectures and lab excercises, the candidates will have consultations with their professors.						
Knowledge evaluation (maximum 100 points)						
Pre-examination obligations		Mandatory	Points	Final exam		
		Mandatory	Points			
Project	Yes	30.00	Oral part of the exam		Yes	30.00
Test	Yes	10.00				
Test	Yes	10.00				
Test	Yes	10.00				
Test	Yes	10.00				
Literature						
Ord.	Author	Title		Publisher	Year	
1,	David A. Chappell	Enterprise Service Bus		O Reilly Media	2004	

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Table 5.2 Course specification

Course:		<h2 style="margin: 0;">Standards and Modeling in power systems</h2>				
Course id:	ESI023					
Number of ECTS:	6					
Teacher:	Gavrić M. Milan					
Course status:	Elective					
Number of active teaching classes (weekly)						
Lectures:	Practical classes:	Other teaching types:	Study research work:	Other classes:		
3	0	3	0	0		
Precondition courses		None				
1. Educational goal:						
The aim of the course is detail study of power systems modeling based on standards and specifications.						
2. Educational outcomes (acquired knowledge):						
The outcome of the course is ? working knowledge of power systems modeling, including planning (versioning), understanding standards and specifications in the field of power systems modeling.						
3. Course content/structure:						
UML and UML profiles. Platform dependent and platform independent architectures. Necessity of semantic connection between heterogeneous data sources. RDF and RDFS. CIM/XML based model. Modeling of network connectivity and network topology in CIM. Defining of electric utility enterprise model in compliance with IEC 61968 and IEC 61970 standards. CIM extensibility. Full and difference models. Multispeak specification.						
4. Teaching methods:						
Teaching is conducted through the lectures and computer practice. Throughout the computer practice student is to complete practically oriented tasks.						
Knowledge evaluation (maximum 100 points)						
Pre-examination obligations		Mandatory	Points	Final exam	Mandatory	Points
Project		Yes	30.00	Theoretical part of the exam	Yes	30.00
Test		Yes	10.00			
Test		Yes	10.00			
Test		Yes	10.00			
Test		Yes	10.00			
Literature						
Ord.	Author	Title		Publisher	Year	
1,	M.Gavrić	Standardi i modeliranje elektroenergetskih sistema - skripta			2013	
2,	PM: L. King	Common Information Model Primer - 1024449		EPRI	2011	
3,	ESRI and Miner and Miner	Electric Distribution Data Model Reference Book - http://downloads2.esri.com/resources/datamodels/electric_distribution.zip		ESRI	2011	
4,	PM: L. King	The Common Information Model for Distribution: An Introduction to the CIM for Integrating Distribution Applications and Systems - 1016058		ESRI	2008	
5,	Gary McNaughton, Waren McNaughton, Cornice Engineering, Inc.	http://www.multispeak.org/about/Specification/Documents/MultiSpeak_V3_UserGuideFinal_013006.pdf		NRECA	2006	

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Table 5.2 Course specification

Course:		<h2 style="margin: 0;">Advanced cloud computing in power systems</h2>				
Course id:	ESI027					
Number of ECTS:	6					
Teachers:	Vukmirović M. Srđan, Gavrić M. Milan, Nimrihter D. Miroslav, Pavlica N. Vladimir					
Course status:	Elective					
Number of active teaching classes (weekly)						
Lectures:	Practical classes:	Other teaching types:	Study research work:	Other classes:		
3	0	2	0	1		
Precondition courses		None				
1. Educational goal:						
The aim of this course is to give students advanced knowledge about Cloud Computing development.						
2. Educational outcomes (acquired knowledge):						
Students passing this exam will have capacity to realize applications in Cloud environment, with special emphasis on the Smart Grid systems.						
3. Course content/structure:						
<p>In this exam students will learn design patterns for Cloud application: Horizontally Scaling Compute Pattern, Queue-Centric Workflow Pattern, Auto-Scaling Pattern, Eventual Consistency Primer, MapReduce Pattern, Database Sharding Pattern, Multitenancy and Commodity Hardware Primer, Busy Signal Pattern, Node Failure Pattern, Network Latency Primer, Colocate Pattern, Valet Key Pattern, CDN Pattern, Multisite Deployment Pattern.</p>						
4. Teaching methods:						
Teaching is conducted through lectures and laboratory excercises. The lectures have a theoretical focus with a number of characteristic examples enforcing easier understanding. The laboratory excercises are linked to the lectures with more practical exmaples. Students are required to complete practical tasks during laboratory excercises. Apart from lectures and lab excercises, the students will have consultations with their professors.						
Knowledge evaluation (maximum 100 points)						
Pre-examination obligations		Mandatory	Points	Final exam	Mandatory	Points
Project		Yes	30.00	Theoretical part of the exam	Yes	30.00
Test		Yes	10.00			
Test		Yes	10.00			
Test		Yes	10.00			
Test		Yes	10.00			
Literature						
Ord.	Author	Title		Publisher	Year	
1,	Bill Wilder	Cloud Architecture Patterns		O Reilly	2012	

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Table 5.2 Course specification

Course:		Business Intelligence and Data Warehouse Systems in Power Systems				
Course id:	ESI031					
Number of ECTS:	6					
Teachers:	Nimrihter D. Miroslav, Gavrić M. Milan, Pavlica N. Vladimir					
Course status:	Elective					
Number of active teaching classes (weekly)						
Lectures:	Practical classes:	Other teaching types:	Study research work:	Other classes:		
3	0	2	0	1		
Precondition courses		None				
1. Educational goal:						
Advanced students' education in the Data Warehouse (DW) system development and its application in Business Intelligence, i.e. software support of strategic and tactic management in organization systems.						
2. Educational outcomes (acquired knowledge):						
To gain necessary skills and knowledge for the design and implementation of business intelligence and data warehouse systems in industry practice, as well as coupling DW systems with decision support systems.						
3. Course content/structure:						
Characteristics, tasks and application domains of DW in power systems. Strategic system analysis as a prerequisite for the development of DW and business intelligence systems. Planning the DW system development process. A common methodology of the DW system development. A common DW system architecture. Enterprise DW systems and Data Mart systems. A common structure and the design of database schemas for DW systems. Methods and techniques of the initial load and subsequent refreshing of a DW database. Extraction, transforming and loading data into a DW database – ETL process. Computation of aggregated data in DW databases. Database Management Systems' mechanisms aimed at providing various DW system implementations. Preserving operational performances of DW systems. Decision support systems. OLAP tools and data analyses. Reporting techniques and tools. Data Mining techniques and tools in DW systems.						
4. Teaching methods:						
Teaching is performed through lessons, oral and computer exercises (in the computer classroom), as well as consultations. Through the teaching process, students are constantly motivated to an intensive discussion, problem oriented reasoning, independent study work and active participation in the whole lecturing process. The prerequisite to enter final exam is to complete all the pre-exam assignments by earning at least 30 points.						
Knowledge evaluation (maximum 100 points)						
Pre-examination obligations		Mandatory	Points	Final exam	Mandatory	Points
Complex exercises		Yes	10.00	Oral part of the exam	Yes	30.00
Complex exercises		Yes	10.00			
Exercise attendance		Yes	5.00			
Project		Yes	30.00			
Project task		Yes	15.00			
Literature						
Ord.	Author	Title		Publisher	Year	
1,	Inmon W. H.	Building The Data Warehouse (3rd Edition)		John Wiley & Sons, Inc, USA	2002	
2,	Ramakrishnan R., Gehrke J.	Database Management Systems		Mc Graw Hill	2000	
3,	Kimball R., Ross M.	The Data Warehouse Toolkit: The Complete Guide to Dimensional Modeling (2nd Edition)		John Wiley and Sons, Inc.	2002	
4,	Grupa autora	Priručnici za obezbeđenje upotrebe izabranog softverskog alata za razvoj DW sistema		-	2005	
5,	Golfarelli Matteo, Rizzi, Stefano	Data Warehouse Design: Modern Principles and Methodologies		McGraw-Hill	2009	

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Table 5.2 Course specification

Course:		<h2 style="margin: 0;">Computer graphic algorithms for smart grid systems</h2>				
Course id:	ESI035					
Number of ECTS:	6					
Teachers:	Ivetić V. Dragan, Nimrihter D. Miroslav, Pavlica N. Vladimir					
Course status:	Elective					
Number of active teaching classes (weekly)						
Lectures:	Practical classes:	Other teaching types:	Study research work:	Other classes:		
3	0	2	0	1		
Precondition courses		None				
1. Educational goal:						
The objective of this course is to acquire the knowledge and programming skills at the geometry and the rasterization levels of 3D graphics pipeline that are required for successful implementation of smart grid systems.						
2. Educational outcomes (acquired knowledge):						
Course outcomes are mastering the knowledge, skills and abilities required for programming graphical objects drawing on parallelism of modern GPU at both the OpenGL (or DirectX) and the GLSL (HLSL) levels.						
3. Course content/structure:						
Overview of matrix and vector calculus. Detailed studies of 3D graphics pipeline and transformations within the geometry/rasterize phases. The internal architecture of a modern GPU. Advanced algorithms for simplifying a mesh model. Vertex shaders. Advanced algorithms for projection and clipping (intersection test methods and collision detection). Culling algorithms. Advanced techniques for texturing and effects. Pixel shaders. Algorithms and data structures for accelerating graphics real-time rendering, used in smart grid.						
4. Teaching methods:						
Teaching is conducted through lectures and computer lab exercises. During the computer practice student is required to complete practically oriented tasks.						
Knowledge evaluation (maximum 100 points)						
Pre-examination obligations		Mandatory	Points	Final exam		
Complex exercises		Yes	50.00	Theoretical part of the exam		
Test		Yes	10.00			
Test		Yes	10.00			
Literature						
Ord.	Author	Title		Publisher	Year	
1,	Dragan Ivetić	Računarska grafika - skripta		FTN Novi Sad	2012	
2,	Akenine-Möller T., Heines E. and Hoffman N	Real-Time rendering		A K Peters	2008	
3,	J. F. Hughes , A. van Dam, M. McGuire, D. Sklar, J. D. Foley, S.K. Feiner, K. Akeley	Computer Graphics: Principles and Practice (3rd Edition)		Addison-Wesley	2013	

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Table 5.2 Course specification

Course:		<h2 style="margin: 0;">Specialized Software in Power Systems</h2>				
Course id:	EE0516					
Number of ECTS:	6					
Teacher:	Švenda S. Goran					
Course status:	Elective					
Number of active teaching classes (weekly)						
Lectures:	Practical classes:	Other teaching types:	Study research work:	Other classes:		
3	2	0	0	1		
Precondition courses		None				
1. Educational goal:						
The main course objective is acquiring knowledge on specialized DMS software and specialized DMS algorithms.						
2. Educational outcomes (acquired knowledge):						
Knowledge on specialized mathematical models and algorithms for modelling and solving problems of distribution networks. Preparation for using DMS software.						
3. Course content/structure:						
<p>The main terminology: (un)balanced elements and (un)symmetrical states, distribution networks characteristics, consumer modelling (characteristic consumers, consumption coefficients, simultaneous coefficients, "Predictive Load Model"), local automation (ARN, voltage regulator, condensation batteries) and equivalencing of network parts.</p> <p>DMS software and its structure. Data structure. Structure of DMS applications, functions for: controlling and surveillance of network, operation planning and optimization, system operation analysis and planning of distributive network development.</p> <p>Specialized DMS applications and algorithms: Load Profile Tool, Load Flow & Performance Indices, State Estimation, Volt Control, Var Control, Volt/Var Control, DSDR, FLISR, Closed Loop, LV equivalent, sensor, VR & CB placement, DG management, Forecasting (NTLF, STLF), etc.</p> <p>Practical application of specialized DMS applications and algorithms.</p>						
4. Teaching methods:						
Lectures and practical classes are held in the computer centre						
Knowledge evaluation (maximum 100 points)						
Pre-examination obligations		Mandatory	Points	Final exam	Mandatory	Points
Exercise attendance		Yes	5.00	Oral part of the exam	Yes	70.00
Lecture attendance		Yes	5.00			
Term paper		Yes	20.00			
Literature						
Ord.	Author	Title		Publisher	Year	
1,	D.Popović, D.Bekut, V.Treskanica	Specijalizovani DMS algoritmi		DMS Group, Novi Sad	2004	
2,	R.G.Pratt, P.J.Balducci, C.Gerkmeyer, ...	The Smart Grid: An Estimation of the Energy and CO2 Benefits		Pacific Northwest National Laboratory, USA	2010	

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Table 5.2 Course specification

Course:		Stručna praksa				
Course id:	ESI040					
Number of ECTS:	3					
Teachers:						
Course status:		Mandatory				
Number of active teaching classes (weekly)						
Lectures:	Practical classes:	Other teaching types:	Study research work:	Other classes:		
0	0	0	0	3		
Precondition courses		None				
1. Educational goal:						
2. Educational outcomes (acquired knowledge):						
3. Course content/structure:						
4. Teaching methods:						
Knowledge evaluation (maximum 100 points)						
Pre-examination obligations		Mandatory	Points	Final exam	Mandatory	Points
Literature						
Ord.	Author	Title		Publisher	Year	

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Table 5.2 Course specification

Course:		Studijsko istraživački rad na teorijskim osnovama - master rada				
Course id:	ESISIR					
Number of ECTS:	17					
Teachers:						
Course status:		Mandatory				
Number of active teaching classes (weekly)						
Lectures:	Practical classes:	Other teaching types:	Study research work:	Other classes:		
0	0	0	15	0		
Precondition courses		None				
1. Educational goal:						
2. Educational outcomes (acquired knowledge):						
3. Course content/structure:						
4. Teaching methods:						
Knowledge evaluation (maximum 100 points)						
Pre-examination obligations		Mandatory	Points	Final exam	Mandatory	Points
Literature						
Ord.	Author	Title		Publisher	Year	

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Table 5.2 Course specification

Course:		Izrada i odbrana master rada				
Course id:	E1MR1					
Number of ECTS:	10					
Teachers:						
Course status:		Mandatory				
Number of active teaching classes (weekly)						
Lectures:	Practical classes:	Other teaching types:	Study research work:	Other classes:		
0	0	0	0	10		
Precondition courses		None				
1. Educational goal:						
<p>Students acquire the knowledge about the techniques, structure and form of writing a research report after completing analysis and other activities conducted within the given topic of the master thesis. By writing a master thesis students gain the experience of writing papers which require the description of the problem, the methods and procedures in conducting research and the obtained results. In addition, preparation and defence of master thesis has the goal of developing the students' ability to prepare the results of their individual form and present it in a suitable form to a wider audience as well as respond to comments and questions related to the thesis topic.</p>						
2. Educational outcomes (acquired knowledge):						
<p>Students are able to develop a systematic approach to the given problem, conduct analysis, apply the acquired knowledge and gain knowledge in other areas for the purpose of finding a solution to the given problem. By working independently on solving the given tasks, students gain awareness of the complexity of the problem in their professional field. By working on the master thesis students gain experience which they can use in practice when solving the problems in their professional field. In preparation for defending their results in public and answering the questions and comments of the thesis committee, the student attains the necessary practical experience on how to present the results of their individual or collective work before an audience.</p>						
3. Course content/structure:						
<p>The content is defined individually, in accordance with the needs and field to be covered by the master thesis. In consultation with the supervisor the student produces the master thesis in written form according to the rules of the Faculty of Technical Sciences. After preparation the student defends the thesis in public as arranged with the thesis supervisor and in accordance with the prescribed rules and procedures.</p>						
4. Teaching methods:						
<p>During the preparation of the master thesis the student consults with the thesis supervisor, and, if necessary, other professors who work in the area covered by the master thesis. The students writes the paper and, having obtained the approval of the thesis committee, provides them with bound copies of the work. The master thesis is defended in public, and the student is obliged to answer the questions and comments after the oral presentation.</p>						
Knowledge evaluation (maximum 100 points)						
Pre-examination obligations		Mandatory	Points	Final exam		
Writing the master thesis		Yes	50.00	Master thesis defence	Yes	50.00

**Study Programme Accreditation**

MASTER ACADEMIC STUDIES

Power Software Engineering

Standard 06. Programme Quality, Contemporaneity and International Compliance

The study program of Power Software Engineering at the Faculty of Technical Sciences in Novi Sad is in compliance with modern European and worldwide educational and scientific trends in the field of Electric and Computer Engineering in Europe and worldwide.

The study program of Power Software Engineering at the Faculty of Technical Sciences in Novi Sad is comparable to similar programs at the following international higher education institutions:

1. National Technical University of Athens, School of Electrical and Computer Engineering, Greece
(http://http://www.ece.ntua.gr/index.php?option=com_courses)
2. Faculty of Electrical Engineering and Information Technology, University of Hannover, Germany
(<http://www.et-inf.uni-hannover.de/etech-it.html?&L=1>)
3. Faculty of Electrical Engineering, Graz University of Technology, Austria
(http://portal.tugraz.at/portal/page/portal/TU_Graz/Studium_Lehre/Studien/ET_Bachelor)
4. Department of Information Technology, Uppsala University
<http://www.it.uu.se/>
5. Faculty of Electrical Engineering and Information Technology, Leipzig University
<http://www.eit.htwk-leipzig.de/>
6. Intelligent Reliable Systems (Information Technology), Aalborg University
<http://www.studyguide.aau.dk/programmes/postgraduate/55773/academic-content/>

The study program of Power Software Engineering is conceived to offer a comprehensive education to students and the most modern and expert knowledge and skills in the field in question.

**Study Programme Accreditation**

MASTER ACADEMIC STUDIES

Power Software Engineering

Standard 07. Student Enrollment

According to the society's needs and available resources, the Faculty of Technical Sciences accepts a number of students at the Master Academic Studies, the study program of Power Software Engineering, who are either financed by the budget or self-financed. The number of the students is defined by a special decision of Educational-Scientific Council of the Faculty and founders' decisions. The selection of applicants and their enrolment is done on the basis of average grades during the previous education and results of the entrance examination, which is defined by the Regulation on student enrolment in study programs.

Students in other study programs, as well as individuals who graduated from other undergraduate academic studies may enroll in this study program as well. The Committee for Evaluation (consisting of the heads of all departments participating in the realization of the study program and the manager of the study program) evaluates all the exams passed and other activities of the candidate which are relevant for the enrolment and on the basis of the recognized number of points it is determined whether the candidate can be enrolled in the Master Academic Studies of the chosen study group – module. The exams passed and evaluated activities are recognized entirely, partly with the corresponding additional work or are not recognized at all.



Study Programme Accreditation

MASTER ACADEMIC STUDIES

Power Software Engineering

Standard 08. Student Evaluation and Progress

The final grade in every of subjects of this study program is formed by continual observation of the work and results the students achieved during the lectures, completion of pre exam assignments and in the final exam.

The students master the study program by passing exams thus obtaining a certain number of ECTS credits, in accordance with the curriculum of the study program. Every subject in the program carries a certain number of ECTS credits gained with each exam passed. The number of ECTS credits is determined on the basis of the amount of work students perform in mastering of a certain subject and by application of unique methodology of the Faculty of Technical Sciences in Novi Sad for all study programs. The success of students in mastering of a certain subject is continually observed and is evaluated with credits. The maximum number of credits a student can acquire in a subject is 100.

The students acquire the credits in a subject by attending the lectures, by fulfilling the pre-exam assignments and by passing the exams. The minimal number of credits a student can acquire by fulfilling the pre exam assignments throughout the lectures is 30 and the maximum 70.

Every subject in the study program has a clear and published mode of credits acquisition including the credits a student acquires on the basis of every particular activity defined in the syllabus or by fulfilling the pre exam assignments and by passing the exams.

The students' final achievement in a subject is graded from 5 (failed) to 10 (excellent). The students' grade is based on the total number of credits the students acquired by fulfilling the pre exam assignments and by passing the exams, taking into account the quality of acquired knowledge and skills. In order for the students to be able to take an exam in a specific subject, they are obliged to acquire at least 55% credits in the pre exam assignments during the semester in which the lectures take place. Additional requirements for passing the exams are defined by the syllabus for every subject separately.

The advancement of the students throughout the studies is defined by the Rules of studying on undergraduate academic studies.



Study Programme Accreditation

MASTER ACADEMIC STUDIES

Power Software Engineering

Standard 09. Teaching Staff

For the realization of the study program of Power Software Engineering of Undergraduate Academic Studies at the Faculty of Technical Sciences in Novi Sad the teaching staff having the required professional and scientific qualifications is assigned.

The number of lecturers is in accordance with the requirements of the study program and is determined by the number of subjects and the number of classes within the subjects. The total number of lecturers is sufficient for realization of the total number of classes in the study program so the lecturers realize 180 classes of active teaching on average per year (lectures, consultations, practice, practical work, etc.) or 6 classes on average per week. None of the lecturers realizes more than 12 classes per week, either at the Faculty of Technical Sciences in Novi Sad or any other higher education institution in Serbia. Out of the total number of required lecturers, more than 70% is employed on a permanent basis at the Faculty of Technical Sciences in Novi Sad.

The number of associates is in accordance with the requirements of the study program. The total number of associates is sufficient for realization of the total number of classes in the study program so the associates realize 300 classes of active teaching on average per year or 10 classes on average per week. None of the lecturers realizes more than 20 classes per week, either at the Faculty of Technical Sciences in Novi Sad or any other higher education institution in Serbia.

Scientific and professional qualifications of the teaching staff are in accordance with academic and scientific area and specialist field in question and the level of their duties as well. Each lecturer has at least five references from specialist or scientific and professional field in question within the study program.

The maximum number of students in a group is 180, in a group for auditory practice it is 60, and group for calculation, computer and laboratory practice it is 20 students.

All the information on lecturers and associates (CVs, academic career, representative references) are available to public via the Internet web site of the Faculty of Technical Sciences in Novi Sad and other means available to the public.

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Science, arts and professional qualifications

Name and last name:	Atlagić S. Branislav		
Academic title:	Associate Professor		
Name of the institution where the teacher works full time and starting date:	Faculty of Technical Sciences - Novi Sad 07.01.1985		
Scientific or art field:	Computer Engineering and Computer Communication		
Academic carier	Year	Institution	Field
Academic title election:	2011		Computer Engineering and Computer Communication
PhD thesis	2001	Faculty of Technical Sciences - Novi Sad	Electrical and Computer Engineering
Magister thesis	1996	Faculty of Technical Sciences - Novi Sad	Electrical and Computer Engineering
Bachelor's thesis	1984	Faculty of Technical Sciences - Novi Sad	Electrical and Computer Engineering

List of courses being held by the teacher in the accredited study programmes

ID	Course name	Study programme name, study type
1. E230	Logic Design of Computer Systems 2	(E20) Computing and Control Engineering, Undergraduate Academic Studies (ES0) Power Software Engineering, Undergraduate Academic Studies (MR0) Measurement and Control Engineering, Undergraduate Academic Studies (E10) Power, Electronic and Telecommunication Engineering, Undergraduate Academic Studies
2. RT49	Real Time Software 1	(E20) Computing and Control Engineering, Undergraduate Academic Studies (MR0) Measurement and Control Engineering, Undergraduate Academic Studies (SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies (SEL) Software Engineering and Information Technologies - Loznica, Undergraduate Academic Studies
3. RT49A	Real Time Software 2	(E20) Computing and Control Engineering, Undergraduate Academic Studies (SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies
4. ESI006	Introduction to critical mission software for power grids	(ES0) Power Software Engineering, Undergraduate Academic Studies
5. ESI009	Smart Grid Communication Protocols	(ES0) Power Software Engineering, Undergraduate Academic Studies
6. ESI019	Critical mission software for power grids	(ES0) Power Software Engineering, Undergraduate Academic Studies
7. RT58	Dedicated Computer Structure Design 2	(E20) Computing and Control Engineering, Master Academic Studies (SE0) Software Engineering and Information Technologies, Master Academic Studies (E10) Power, Electronic and Telecommunication Engineering, Master Academic Studies
8. ESI025	Simulation of Power Greed critical mission systems	(ES0) Power Software Engineering, Master Academic Studies
9. ESI033	Advanced Power Grid Communication Protocols	(ES0) Power Software Engineering, Master Academic Studies
10. DRNI02	Selected Topics in Advanced Software Architecture	(E20) Computing and Control Engineering, Doctoral Academic Studies

Representative references (minimum 5, not more than 10)

1.	Udžbenik "Logičko projektovanje računarskih sistema II", V.Kovačević, B.Atlagić, FTN 2007/2009.
2.	M.Popovic, B.Atlagic, V.Kovacevic, "Case study: a maintenance practice used with real-time telecommunications software", Journal of Software Maintenance and Evolution, John Wiley and Sons Ltd, March-April issue, 2001.
3.	D.Kukolj, M.Berko-Pušić, B.Atlagić, "Experimental Design of Supervisory Control Functions Based on Multilayer Perceptron", Artificial Intelligence for Engineering Design, Analysis and Manufacturing, 15(5) 2001, pp. 425-431.



Study Programme Accreditation

MASTER ACADEMIC STUDIES

Power Software Engineering

Representative references (minimum 5, not more than 10)

4.	D.Kukolj, B.Atlagic, M.Petrov, "Data clustering using a re-organizing neural network", Taylor & Francis Inc., Cybernetics and Systems, An Int. Journal, Vol. 37, No. 7, 2006, pp. 779-790.
5.	Generalizovani akviziciono upravljački sistem - GAUS
6.	B.Atlagic, M.Sagi, D.Milinkov, S.Culaja, B.Bogovac, "A way towards efficiency of SCADA infrastructure", ECBS 2012, Novi Sad 2012.
7.	B.Atlagic, D.Milinkov, M.Sagi, B.Bogovac, "High-Performance Networked SCADA Architecture For Safety-Critical Systems", ECBS-EERC 2011, Bratislava.
8.	B.Atlagic, V.Mihić, T.Maruna, "A Methodology for Specification and Development of Control Code in Industrial DCS Application", XIV International Conference on Systems Science, Wroclav 2001.
9.	B.Atlagic, M.Sagi, D.Milinkov, B.Bogovac, S.Culaja, "Model-based approach to the Development of SCADA applications", The 9th IEEE Workshop on Model-Based Development for Computer-Based Systems, Novi Sad 2012.
10.	B.Atlagic, D.Kukolj, V.Kovacevic, M.Popovic, "Application development environment of an integrated SCADA system", EUROCON 2003, Ljubljana 2003.

Summary data for teacher's scientific or art and professional activity:

Quotation total :	0			
Total of SCI(SSCI) list papers :	3			
Current projects :	Domestic :	2	International :	1

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Science, arts and professional qualifications

Name and last name:	Čapko Lj. Darko		
Academic title:	Assistant Professor		
Name of the institution where the teacher works full time and starting date:	Faculty of Technical Sciences - Novi Sad 25.01.1999		
Scientific or art field:	Automatic Control and System Engineering		
Academic carieer	Year	Institution	Field
Academic title election:	2012	Faculty of Technical Sciences - Novi Sad	Automatic Control and System Engineering
PhD thesis	2012	Faculty of Technical Sciences - Novi Sad	Automatic Control and System Engineering
Magister thesis	2002	Faculty of Technical Sciences - Novi Sad	Automatic Control and System Engineering
Bachelor's thesis	1998	Faculty of Technical Sciences - Novi Sad	Automatic Control and System Engineering

List of courses being held by the teacher in the accredited study programmes

	ID	Course name	Study programme name, study type
1.	E232	System Modeling and Simulation	(E20) Computing and Control Engineering, Undergraduate Academic Studies (ES0) Power Software Engineering, Undergraduate Academic Studies (M40) Technical Mechanics and Technical Design, Undergraduate Academic Studies (MR0) Measurement and Control Engineering, Undergraduate Academic Studies (SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies (SEL) Software Engineering and Information Technologies - Loznica, Undergraduate Academic Studies
2.	H213	System Modelling and Simulation 1	(G10) Geodesy and Geomatics, Undergraduate Academic Studies (H00) Mechatronics, Undergraduate Academic Studies
3.	BMI124	System Modeling and Simulation	(BM0) Biomedical Engineering, Undergraduate Academic Studies
4.	E2312	Software design for SCADA systems	(E20) Computing and Control Engineering, Undergraduate Academic Studies (SEL) Software Engineering and Information Technologies - Loznica, Undergraduate Academic Studies
5.	ESI013	Multi-tier applications development in power systems	(ES0) Power Software Engineering, Undergraduate Academic Studies
6.	ESI020	Data structures and algorithms in power systems	(ES0) Power Software Engineering, Undergraduate Academic Studies
7.	SEAU02	SCADA Software	(SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies
8.	SEAU09	Software design of SCADA systems	(SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies (SEL) Software Engineering and Information Technologies - Loznica, Undergraduate Academic Studies
9.	AU502	Distributed Control Systems	(E20) Computing and Control Engineering, Master Academic Studies (MR0) Measurement and Control Engineering, Master Academic Studies (E10) Power, Electronic and Telecommunication Engineering, Master Academic Studies
10.	BMIM3D	Development of integrated biomedical systems	(BM0) Biomedical Engineering, Master Academic Studies
11.	E2533	Discrete event simulation	(E20) Computing and Control Engineering, Master Academic Studies
12.	E2535	Software Algorithms in Supervisory Control and Data Acquisition Systems	(E20) Computing and Control Engineering, Master Academic Studies (E10) Power, Electronic and Telecommunication Engineering, Master Academic Studies



Study Programme Accreditation

MASTER ACADEMIC STUDIES

Power Software Engineering

List of courses being held by the teacher in the accredited study programmes

ID	Course name	Study programme name, study type
13.	ESI024 Applied algorithms in power systems	(ES0) Power Software Engineering, Master Academic Studies
14.	ESI034 Multi-tier applications development in Smart Grids	(ES0) Power Software Engineering, Master Academic Studies
15.	SEAM06 Integration of Distributed Control Systems	(SE0) Software Engineering and Information Technologies, Master Academic Studies
16.	DAU006 Selected Chapters in Modeling and Simulation of Dynamic Systems	(E20) Computing and Control Engineering, Doctoral Academic Studies
17.	DAU018 Selected Chapters in Distributed Control Systems	(E20) Computing and Control Engineering, Doctoral Academic Studies
18.	ZRD25A Selected chapters from Artificial Ingeligence	(Z01) Safety at Work, Doctoral Academic Studies

Representative references (minimum 5, not more than 10)

1.	Vukmirović S., Erdeljan A., Čapko D., Lendak I., Nedić N., „Optimization of workflow scheduling in Utility Management System with hierarchical neural network“, International Journal of Computational Intelligence Systems., Vol. 4, No. 4, pp. 672-679, 2011., ISSN 1875-6891
2.	Vukmirović S., Erdeljan A., Lendak I., Čapko D., „A novel software architecture for Smart Metering systems“, Journal of Scientific and Industrial Research, Vol. 2010, No. 12, pp. 937-941, 2010., ISSN 0022-4456
3.	Čapko D., Erdeljan A., Vukmirović S., Lendak I., „A Hybrid Genetic Algorithm for Partitioning of Data Model in Distribution Management Systems“, Information technology and control, Vol. 40, No. 4, 2011., ISSN 1392-124X
4.	Čapko D., Erdeljan A., Popović M., Švenda G., „An Optimal Initial Partitioning of Large Data Model in Utility Management Systems“, Advances in Electrical and Computer Engineering, No. 4, 2011., ISSN 1582-7445
5.	Nedić N., Vukmirović S., Erdeljan A., Lendak I., Čapko D., „ A Genetic Algorithm Approach for Utility Management System Workflow Scheduling “, Information technology and control, Vol. 39, No. 4, pp. 310-316, 2010., ISSN 1392-124X
6.	Vukmirović S., Erdeljan A., Čapko D., Lendak I., „Extension of the Common Information Model with Virtual Meter“, Electronics and electrical engineering, Vol. 107, No. 1, pp. 59-64, 2011., ISSN 1392-1215
7.	Čapko D., Erdeljan A., Švenda G., Popović M., „Dynamic Repartitioning of Large Data Model in Distribution Management Systems“, Electronics and electrical engineering, Vol. 121, No. 4, pp. 83-85,2012., ISSN 1392-1215
8.	Vukmirović S., Erdeljan A., Lendak I., Čapko D., „Optimal Workflow Scheduling in Critical Infrastructure Systems with Neural Networks“, Journal of Applied Research and Technology, Vol. 10, No. 2, pp. 114-121, 2012., ISSN 1665-6423
9.	Vukmirovic, Srdjan; Erdeljan, Aleksandar; Lendak, Imre; Capko, Darko: Unifying the Common Information Model (CIM), REVUE ROUMAINE DES SCIENCES TECHNIQUES-SERIE ELECTROTECHNIQUE ET ENERGETIQUE 2012 57 (3):301-310
10.	Velimir Congradac, Marta Prica, Marija Paspalj, Dubravka Bojanic, Darko Capko: Algorithm for blinds control based on the optimization of blind tilt angle using a genetic algorithm and fuzzy logic,Solar Energy 86 (2012), pp 2762–2770

Summary data for teacher's scientific or art and professional activity:

Quotation total :	0
Total of SCI(SSCI) list papers :	10
Current projects :	Domestic : 1 International : 0

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Science, arts and professional qualifications

Name and last name:	Erdeljan M. Aleksandar		
Academic title:	Associate Professor		
Name of the institution where the teacher works full time and starting date:	Faculty of Technical Sciences - Novi Sad 24.07.1989		
Scientific or art field:	Automatic Control and System Engineering		
Academic carier	Year	Institution	Field
Academic title election:	2011		Automatic Control and System Engineering
PhD thesis	2000	Faculty of Technical Sciences - Novi Sad	Automatic Control and System Engineering
Magister thesis	1993	School of Electrical Engineering - Beograd	Automatic Control and System Engineering
Bachelor's thesis	1989	Faculty of Technical Sciences - Novi Sad	Automatic Control and System Engineering

List of courses being held by the teacher in the accredited study programmes

	ID	Course name	Study programme name, study type
1.	E126	System Control, Modeling and Simulation	(E10) Power, Electronic and Telecommunication Engineering, Undergraduate Academic Studies
2.	E232	System Modeling and Simulation	(E20) Computing and Control Engineering, Undergraduate Academic Studies (ES0) Power Software Engineering, Undergraduate Academic Studies (M40) Technical Mechanics and Technical Design, Undergraduate Academic Studies (MR0) Measurement and Control Engineering, Undergraduate Academic Studies (SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies (SEL) Software Engineering and Information Technologies - Loznica, Undergraduate Academic Studies
3.	GI303A	Distributed Systems in Geomatics	(GI0) Geodesy and Geomatics, Undergraduate Academic Studies
4.	H213	System Modelling and Simulation 1	(GI0) Geodesy and Geomatics, Undergraduate Academic Studies (H00) Mechatronics, Undergraduate Academic Studies
5.	BMI124	System Modeling and Simulation	(BM0) Biomedical Engineering, Undergraduate Academic Studies
6.	E2312	Software design for SCADA systems	(E20) Computing and Control Engineering, Undergraduate Academic Studies (SEL) Software Engineering and Information Technologies - Loznica, Undergraduate Academic Studies
7.	ESI001	Software Tools in Power Engineering	(ES0) Power Software Engineering, Undergraduate Academic Studies
8.	ESI010	Basics of control in power systems	(ES0) Power Software Engineering, Undergraduate Academic Studies (E10) Power, Electronic and Telecommunication Engineering, Undergraduate Academic Studies
9.	ESI015	Distributed Computer Systems in Power Systems	(ES0) Power Software Engineering, Undergraduate Academic Studies
10.	SEAU02	SCADA Software	(SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies
11.	SEAU09	Software design of SCADA systems	(SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies (SEL) Software Engineering and Information Technologies - Loznica, Undergraduate Academic Studies
12.	SEI002	Architecture of Distributed Systems in Power Systems	(ES0) Power Software Engineering, Undergraduate Academic Studies



Study Programme Accreditation

MASTER ACADEMIC STUDIES

Power Software Engineering

List of courses being held by the teacher in the accredited study programmes

ID	Course name	Study programme name, study type
13. AU502	Distributed Control Systems	(E20) Computing and Control Engineering, Master Academic Studies (MR0) Measurement and Control Engineering, Master Academic Studies (E10) Power, Electronic and Telecommunication Engineering, Master Academic Studies
14. H301	System Modeling and Symulation	(H00) Mechatronics, Master Academic Studies
15. S054	Computer Modelling and Simulation	(S01) Postal Traffic and Telecommunications, Master Academic Studies
16. BMIM3D	Development of integrated biomedical systems	(BM0) Biomedical Engineering, Master Academic Studies
17. E2532	Automatic Control Systems Project Management	(E20) Computing and Control Engineering, Master Academic Studies
18. E2533	Discrete event simulation	(E20) Computing and Control Engineering, Master Academic Studies
19. E2535	Software Algorithms in Supervisory Control and Data Acquisition Systems	(E20) Computing and Control Engineering, Master Academic Studies (E10) Power, Electronic and Telecommunication Engineering, Master Academic Studies
20. ESI030	Distributed Software Architectures for Smart Energy Grids	(ES0) Power Software Engineering, Master Academic Studies
21. SEAM06	Integration of Distributed Control Systems	(SE0) Software Engineering and Information Technologies, Master Academic Studies
22. DAU006	Selected Chapters in Modeling and Simulation of Dynamic Systems	(E20) Computing and Control Engineering, Doctoral Academic Studies
23. DAU018	Selected Chapters in Distributed Control Systems	(E20) Computing and Control Engineering, Doctoral Academic Studies
24. ZRD25A	Selected chapters from Artificial Ingeligence	(Z01) Safety at Work, Doctoral Academic Studies

Representative references (minimum 5, not more than 10)

1.	Lendak I., Erdeljan A., Popović D.: Algorithm for cataloguing topologies in the Common Information Model (CIM), Computers Math. Appl. 61, No. 3, 715-721 (2011). ISSN 0898-1221
2.	Vukmirović S., Erdeljan A., Čapko D., Lendak I., Nedić N.: Optimization of workflow scheduling in Utility Management System with hierarchical neural network, International Journal of Computational Intelligence Systems, 2011, Vol. 4, No 4, pp. 672-679, ISSN 1875-6883
3.	Čapko D., Erdeljan A., Švenda G., Popović M.: Dynamic Repartitioning of Large Data Model in Distribution Management Systems, Electronics and electrical engineering, 2012, No 4(120), pp. 83-88, ISSN 1392-1215
4.	Ilić S., Vukmirović S., Erdeljan A., Kulić F.: Hybrid Artificial Neural Network System for Short-Term Load Forecasting, Thermal Science, 2012, Vol. 16, No S, pp. 215-224, ISSN 0354-9836
5.	Vukmirović S., Erdeljan A., Čapko D., Lendak I.: Extension of the Common Information Model with Virtual Meter, Electronics and electrical engineering, 2011, Vol. 107, No 1, pp. 59-64, ISSN 1392-1215
6.	Čapko D., Erdeljan A., Popović M., Švenda G.: An Optimal Initial Partitioning of Large Datasets in Utility Management Systems, Journal of Advances in Electrical and Computer Engineering, 2011, Vol. 11, No 4, pp. 41-46, ISSN 1582-7445
7.	Čapko D., Erdeljan A., Vukmirović S., Lendak I.: A HYBRID GENETIC ALGORITHM FOR PARTITIONING OF DATA MODEL IN DISTRIBUTION MANAGEMENT SYSTEMS, Information technology and control, 2011, Vol. 40, No 4, pp. 316-322, ISSN 1392-124X
8.	Vukmirović S., Nedić N., Erdeljan A., Lendak I., Čapko D.: A Genetic Algorithm Approach for Utility Management System Workflow Scheduling, Information technology and control, 2010, Vol. 39, No 4, pp. 310-316, ISSN 1392-124X
9.	Vukmirović S., Erdeljan A., Lendak I., Čapko D.: A novel software architecture for Smart Metering systems, Journal of Scientific and Industrial Research (JSIR), 2010, Vol. 2010, No 12, pp. 937-941, ISSN 0022-4456
10.	Čapko D., Erdeljan A., Popović M., Švenda G.: An Optimal Relationship-Based Partitioning of Large Datasets, LNCS, Springer Verlag, 2010, str. 555-558, ISBN 978-3-642-15575-8

Summary data for teacher's scientific or art and professional activity:

Quotation total :	1
Total of SCI(SSCI) list papers :	9
Current projects :	Domestic : 3 International : 0



Science, arts and professional qualifications

Name and last name:	Gavrić M. Milan		
Academic title:	Assistant Professor		
Name of the institution where the teacher works full time and starting date:	Faculty of Technical Sciences - Novi Sad 01.11.2012		
Scientific or art field:	Informatics		
Academic career	Year	Institution	Field
Academic title election:	2012	Faculty of Technical Sciences - Novi Sad	Informatics
PhD thesis	2011	Faculty of Technical Sciences - Novi Sad	Unknown
Magister thesis	1998	Faculty of Technical Sciences - Novi Sad	Automatic Control and System Engineering
Bachelor's thesis	1994	Faculty of Technical Sciences - Novi Sad	Automatic Control and System Engineering

List of courses being held by the teacher in the accredited study programmes

	ID	Course name	Study programme name, study type
1.	ESI001	Software Tools in Power Engineering	(ES0) Power Software Engineering, Undergraduate Academic Studies
2.	ESI003	Electric power software development	(ES0) Power Software Engineering, Undergraduate Academic Studies
3.	ESI004	Cloud Computing in power systems	(ES0) Power Software Engineering, Undergraduate Academic Studies
4.	ESI012	Smart Grid Networks	(ES0) Power Software Engineering, Undergraduate Academic Studies
5.	ESI016	Smart Grid Programming	(ES0) Power Software Engineering, Undergraduate Academic Studies
6.	ESI023	Standards and Modeling in power systems	(ES0) Power Software Engineering, Master Academic Studies
7.	ESI027	Advanced cloud computing in power systems	(ES0) Power Software Engineering, Master Academic Studies
8.	ESI029	Simulation of power grid critical mission systems	(ES0) Power Software Engineering, Master Academic Studies
9.	ESI031	Business Intelligence and Data Warehouse Systems in Power Systems	(ES0) Power Software Engineering, Master Academic Studies
10.	ESI032	Smart grid applications in Cloud	(ES0) Power Software Engineering, Master Academic Studies
11.	ESI036	Visualization techniques in power systems	(ES0) Power Software Engineering, Master Academic Studies

Representative references (minimum 5, not more than 10)

1.	Gavrić M, Martinov M, Bojic S, Djatkov Dj, Pavlovic M. 2011. Short- and long-term dynamic accuracies determination of satellite-based positioning devices using a specially designed testing facility. Computers and Electronics in Agriculture 76: 297–305.
2.	Gavrić, M, Martinov, M. 2007. Low Cost GPS-Based System for Site-Specific Farming at Flat Terrains – Case Study. Agricultural Engineering International, CIGR e-journal, 9: Manuscript ATOE 07 004.
3.	Martinov, M., Gavrić, M., Kiš, F., Brunet, B. and G. Mickovic. 2009. Applicability of GPS guidance in South-East European agriculture. 37. International Symposium Agricultural Engineering: Actual Tasks on Agricultural Engineering, Opatija, 10-13 February 2009, Book of Proc: 201-212.
4.	Varga, E., Lendak, I., Gavric, M., Erdeljan, A. 2011. Applicability of RESTful web services in control center software integrations. International Conference on Innovations in Information Technology – IIT. 282 – 286.
5.	Lendak, I., Varga, E., Erdeljan, A., Gavric, M. 2010. RESTful web services and the Common Information Model (CIM). Energy Conference and Exhibition (EnergyCon), 2010 IEEE International. 716-721.
6.	Lendak, I., Varga, E., Erdeljan, A., Gavric, M. 2010. RESTful access to power system state variables, IEEE Region 8 International Conference on Computational Technologies in Electrical and Electronics Engineering - SIBIRCON.
7.	Sekulić, P., Gavrić, M., Martinov, M. and M. Konstantinović. 2004. GIS and GPS for Sustainable Agriculture and Traceability – Case Study Vojvodina. Second Conference of AESEE “Energy Efficiency and Agricultural Engineering, Rousse, Bulgaria, Book of Proceedings, 362-368.
8.	Gavrić, M. i M. Martinov. 2006. Postupci i tačnost primene GPS u poljoprivredi. Savremena poljoprivredna tehnika, 32(1-2): 96-102.
9.	Gavrić, M., Sekulić, P.Đ. (2004) Primena GIS-a i GPS-a u poljoprivredi. Zbornik radova Instituta za ratarstvo i povrtarstvo, br. 40, str. 171-178
10.	Gavrić M., Sekulić P. 2003. Information System on Soil Protection. International Congress on Information Technology in Agriculture, Food and Environment, 07-10. October 2003, Izmir, Turkey, Proceedings 75-79.

Summary data for teacher's scientific or art and professional activity:



UNIVERSITY OF NOVI SAD

FACULTY OF TECHNICAL SCIENCES 21000 NOVI SAD, TRG DOSITEJA OBRADOVIĆA 6



Study Programme Accreditation

MASTER ACADEMIC STUDIES

Power Software Engineering

Quotation total :	1			
Total of SCI(SSCI) list papers :	0			
Current projects :	Domestic :	0	International :	0

	UNIVERSITY OF NOVI SAD FACULTY OF TECHNICAL SCIENCES 21000 NOVI SAD, TRG DOSITEJA OBRADOVIĆA 6	
	Study Programme Accreditation MASTER ACADEMIC STUDIES Power Software Engineering	

Science, arts and professional qualifications

Name and last name:	Hajduković P. Miroslav		
Academic title:	Full Professor		
Name of the institution where the teacher works full time and starting date:	Faculty of Technical Sciences - Novi Sad 01.07.1993		
Scientific or art field:	Applied Computer Science and Informatics		
Academic career	Year	Institution	Field
Academic title election:	1998	Faculty of Technical Sciences - Novi Sad	Applied Computer Science and Informatics
PhD thesis	1984	Faculty of Electrical Engineering - Sarajevo	Applied Computer Science and Informatics
Magister thesis	1980	Faculty of Electrical Engineering - Sarajevo	Applied Computer Science and Informatics
Bachelor's thesis	1977	Faculty of Electrical Engineering - Sarajevo	Applied Computer Science and Informatics

List of courses being held by the teacher in the accredited study programmes

	ID	Course name	Study programme name, study type
1.	E217	Computer Architecture	(E20) Computing and Control Engineering, Undergraduate Academic Studies (ES0) Power Software Engineering, Undergraduate Academic Studies
2.	E225	Operating Systems	(E20) Computing and Control Engineering, Undergraduate Academic Studies (ES0) Power Software Engineering, Undergraduate Academic Studies
3.	E243	Human Computer Interaction	(E20) Computing and Control Engineering, Undergraduate Academic Studies (SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies (SEL) Software Engineering and Information Technologies - Loznica, Undergraduate Academic Studies
4.	EE301	Operating Systems and Competitive Programming	(MR0) Measurement and Control Engineering, Undergraduate Academic Studies (E10) Power, Electronic and Telecommunication Engineering, Undergraduate Academic Studies
5.	RI4A	Computer Graphics	(E20) Computing and Control Engineering, Undergraduate Academic Studies (ES0) Power Software Engineering, Undergraduate Academic Studies (F10) Engineering Animation, Undergraduate Academic Studies (SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies (SEL) Software Engineering and Information Technologies - Loznica, Undergraduate Academic Studies
6.	E2529	Parallel and distributed architectures	(E20) Computing and Control Engineering, Master Academic Studies (ES0) Power Software Engineering, Master Academic Studies (MR0) Measurement and Control Engineering, Master Academic Studies (E10) Power, Electronic and Telecommunication Engineering, Master Academic Studies
7.	DAU014	Selected Topics in Computing	(E20) Computing and Control Engineering, Doctoral Academic Studies (OM1) Mathematics in Engineering, Doctoral Academic Studies
8.	DRNI18	Selected Topics in Distributed/Mobile computing	(E20) Computing and Control Engineering, Doctoral Academic Studies (F20) Engineering Animation, Doctoral Academic Studies

Representative references (minimum 5, not more than 10)

1.	Hajduković M., "Programski jezik CONCERT", Pomoćni udžbenik, Fakultet tehničkih nauka, 1995.
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Study Programme Accreditation

MASTER ACADEMIC STUDIES

Power Software Engineering

Representative references (minimum 5, not more than 10)

2.	Hajduković M., "Organizacija računara", Pomoćni udžbenik, Fakultet tehničkih nauka, 1996.
3.	Hajduković M., Suvajdžin Z., "Uvod u međunarodni standard IEC 61131-3", Pomoćni udžbenik, Fakultet tehničkih nauka, 2002.
4.	Hajduković M., "Operativni sistemi", Osnovni udžbenik, Fakultet tehničkih nauka, 2004.
5.	Hajduković M., "Arhitektura računara", Osnovni udžbenik, Fakultet tehničkih nauka, 2004.
6.	Hajduković M. i ostali, "The active side principle approach to the client server protocol design", YUJOR, vol. 6, no. 1, Belgrade, 1996., 121- 127
7.	Hajduković M. i ostali, "Uninterruptable and other regions", YUJOR, vol. 8, no. 2, Belgrade, 1998., 323- 329
8.	Hajduković M. i ostali, "Communication models: an educational framework for parallel programming", YUJOR, vol. 9, no. 1, Belgrade, 1999., 129- 139
9.	Hajduković M. između ostalih, "Character oriented program editing – habit or necessity?", NSJOM, vol. 33, no. 1, Novi Sad, 2003., 53- 65
10.	Hajduković M. između ostalih, "A problem of program execution time measurement", NSJOM, vol. 33, no. 1, Novi Sad, 2003., 67- 73

Summary data for teacher's scientific or art and professional activity:

Quotation total :	11			
Total of SCI(SSCI) list papers :	3			
Current projects :	Domestic :	1	International :	0

	UNIVERSITY OF NOVI SAD FACULTY OF TECHNICAL SCIENCES 21000 NOVI SAD, TRG DOSITEJA OBRADOVIĆA 6	
	Study Programme Accreditation MASTER ACADEMIC STUDIES Power Software Engineering	

Science, arts and professional qualifications

Name and last name:	Ivetić V. Dragan		
Academic title:	Full Professor		
Name of the institution where the teacher works full time and starting date:	Faculty of Technical Sciences - Novi Sad 22.10.1990		
Scientific or art field:	Applied Computer Science and Informatics		
Academic carieer	Year	Institution	Field
Academic title election:	2010	Faculty of Technical Sciences - Novi Sad	Applied Computer Science and Informatics
PhD thesis	1999	Faculty of Technical Sciences - Novi Sad	Applied Computer Science and Informatics
Magister thesis	1994	Faculty of Technical Sciences - Novi Sad	Applied Computer Science and Informatics
Bachelor's thesis	1990	Faculty of Technical Sciences - Novi Sad	Applied Computer Science and Informatics

List of courses being held by the teacher in the accredited study programmes

	ID	Course name	Study programme name, study type
1.	E243	Human Computer Interaction	(E20) Computing and Control Engineering, Undergraduate Academic Studies (SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies (SEL) Software Engineering and Information Technologies - Loznica, Undergraduate Academic Studies
2.	H207	Programming and Programming Languages	(F10) Engineering Animation, Undergraduate Academic Studies (H00) Mechatronics, Undergraduate Academic Studies (S01) Postal Traffic and Telecommunications, Undergraduate Academic Studies
3.	RI4A	Computer Graphics	(E20) Computing and Control Engineering, Undergraduate Academic Studies (ES0) Power Software Engineering, Undergraduate Academic Studies (F10) Engineering Animation, Undergraduate Academic Studies (SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies (SEL) Software Engineering and Information Technologies - Loznica, Undergraduate Academic Studies
4.	E0243	Human-Computer Interaction	(ES0) Power Software Engineering, Undergraduate Academic Studies (F10) Engineering Animation, Undergraduate Academic Studies
5.	E2505	Multimedia Systems	(E20) Computing and Control Engineering, Master Academic Studies (ES0) Power Software Engineering, Master Academic Studies (F20) Engineering Animation, Master Academic Studies (SE0) Software Engineering and Information Technologies, Master Academic Studies
6.	E2516	Virtual Reality Systems	(E20) Computing and Control Engineering, Master Academic Studies (SE0) Software Engineering and Information Technologies, Master Academic Studies
7.	E2528	Computer game development	(E20) Computing and Control Engineering, Master Academic Studies (SE0) Software Engineering and Information Technologies, Master Academic Studies
8.	E2534	Data Compression	(E20) Computing and Control Engineering, Master Academic Studies (SE0) Software Engineering and Information Technologies, Master Academic Studies



List of courses being held by the teacher in the accredited study programmes

ID	Course name	Study programme name, study type
9. ESI035	Computer graphic algorithms for smart grid systems	(ES0) Power Software Engineering, Master Academic Studies
10. ESI036	Visualization techniques in power systems	(ES0) Power Software Engineering, Master Academic Studies
11. DRNI09	Selected Topics in Human Centered Computing	(E20) Computing and Control Engineering, Doctoral Academic Studies (F20) Engineering Animation, Doctoral Academic Studies
12. FDS151	Selected Chapters in Multimedia	(F00) Graphic Engineering and Design, Doctoral Academic Studies
13. FDS152	Selected Topics in Computer Graphics	(F00) Graphic Engineering and Design, Doctoral Academic Studies
14. DRNI15	Selected Topics in Advanced Computer Graphics	(E20) Computing and Control Engineering, Doctoral Academic Studies (F20) Engineering Animation, Doctoral Academic Studies
15. DRNI18	Selected Topics in Distributed/Mobile computing	(E20) Computing and Control Engineering, Doctoral Academic Studies (F20) Engineering Animation, Doctoral Academic Studies

Representative references (minimum 5, not more than 10)

1.	Dinu Dragan, Dragan Ivetic, "Request Redirection Paradigm in Medical Image Archive Implementation", Computer methods and programs in biomedicine, Elsevier, Vol. 107, No. 2, p.111-121, ISSN 0169-2607, Aug 2012
2.	Dragan Ivetic, Dinu Dragan, "Medical Image on the go!", Journal of Medical Systems, Springer, Vol. 35, No. 4, pp. 499-516, ISSN 0148-5598, August 2011.
3.	Dragan Ivetic, Srdjan Mihic, Branko Markoski, "Augmented AVI video file for road surveying", Computers and Electrical Engineering, Elsevier, Vol. 36, No. 1, pp. 169-179, ISSN 0045-7906, January 2010.
4.	Dinu Dragan, Dragan Ivetic, "Architectures of DICOM based PACS for JPEG2000 Medical Image Streaming", Computer Science and Information Systems Journal (ComSIS), vol. 6(1), ISSN: 1820-0214, pp. 185-203, ComSIS Consortium, Serbia, June 2009.
5.	Dragan Ivetic, Dusan Malbaski, "A dichotomous software life-cycle model", Journal of Applied Systems Studies, Nikitas. A. Assimakopoulos, Ed., Cambridge International Science Publishing, Cambridge, England, vol. 2, No. 2, 2001
6.	Dinu Dragan, Dragan Ivetic, "A Comprehensive Quality Evaluation System for PACS", Ubiquitous Computing and Communication Journal, Special Issue on ICIT 2009 Conference - Bioinformatics and Image, Vol. 4(3), ISSN: 1992-8424, pp. 642-650, UBICC Publisher, July 2009.
7.	Veljko Petrovic, Dragan Ivetic, "Education and out of the box thinking – linearization of Graham’s scan algorithm complexity as fruit of education policy", Ubiquitous Computing and Communications Journal, Special Issue on ICIT 2011 conference, ISSN: 1992-8424, pp. 43-51, UBICC Publisher, 2011.
8.	Dusan Malbaski, Dragan Ivetic, "Some notes on the formal definition of streams", Byron Papathanassiou, Ed., Yugoslav Journal of Operations Research, vol. 6, no. 2, 1996., 277-284.
9.	Ivetic Dragan, Dinu Dragan, "JPEG2000 Aims To Make Medical Image Ubiquitous", Egyptian Computer Science Journal, Vol. 31, No. 5, pp. 1-13, ISSN 1110-2586, Sept. 2009.
10.	Dragan D., Ivetic D.: Chapter 28: Tools for Ubiquitous PACS System, in "Proceedings of the International Conference on Human-centric Computing 2011 and Embedded Multimedia Computing 2011", Lecture Notes in Electrical Engineering, J.J. Park et al. (eds.), Berlin, Springer, 2011, str. 297-308, ISBN 978-94-007-2104-3

Summary data for teacher's scientific or art and professional activity:

Quotation total :	55		
Total of SCI(SSCI) list papers :	4		
Current projects :	Domestic :	2	International : 0

	UNIVERSITY OF NOVI SAD FACULTY OF TECHNICAL SCIENCES 21000 NOVI SAD, TRG DOSITEJA OBRADOVIĆA 6	
	Study Programme Accreditation MASTER ACADEMIC STUDIES Power Software Engineering	

Science, arts and professional qualifications

Name and last name:	Lendak I. Imre		
Academic title:	Assistant Professor		
Name of the institution where the teacher works full time and starting date:	Faculty of Technical Sciences - Novi Sad 01.02.2005		
Scientific or art field:	Automatic Control and System Engineering		
Academic career	Year	Institution	Field
Academic title election:	2012	Faculty of Technical Sciences - Novi Sad	Automatic Control and System Engineering
PhD thesis	2011	Faculty of Technical Sciences - Novi Sad	Automatic Control and System Engineering
Magister thesis	2007	Faculty of Technical Sciences - Novi Sad	Automatic Control and System Engineering
Bachelor's thesis	2002	Faculty of Technical Sciences - Novi Sad	Automatic Control and System Engineering

List of courses being held by the teacher in the accredited study programmes

	ID	Course name	Study programme name, study type
1.	E232	System Modeling and Simulation	(E20) Computing and Control Engineering, Undergraduate Academic Studies (E50) Power Software Engineering, Undergraduate Academic Studies (M40) Technical Mechanics and Technical Design, Undergraduate Academic Studies (MR0) Measurement and Control Engineering, Undergraduate Academic Studies (SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies (SEL) Software Engineering and Information Technologies - Loznica, Undergraduate Academic Studies
2.	GI303A	Distributed Systems in Geomatics	(GI0) Geodesy and Geomatics, Undergraduate Academic Studies
3.	E2312	Software design for SCADA systems	(E20) Computing and Control Engineering, Undergraduate Academic Studies (SEL) Software Engineering and Information Technologies - Loznica, Undergraduate Academic Studies
4.	ESI003	Electric power software development	(E50) Power Software Engineering, Undergraduate Academic Studies
5.	ESI011	Software security and safety in power engineering	(E50) Power Software Engineering, Undergraduate Academic Studies
6.	ESI016	Smart Grid Programming	(E50) Power Software Engineering, Undergraduate Academic Studies
7.	ESI017	Mobile computing in power systems	(E50) Power Software Engineering, Undergraduate Academic Studies
8.	SEAU02	SCADA Software	(SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies
9.	AU502	Distributed Control Systems	(E20) Computing and Control Engineering, Master Academic Studies (MR0) Measurement and Control Engineering, Master Academic Studies (E10) Power, Electronic and Telecommunication Engineering, Master Academic Studies
10.	S054	Computer Modelling and Simulation	(S01) Postal Traffic and Telecommunications, Master Academic Studies
11.	BMIM3D	Development of integrated biomedical systems	(BM0) Biomedical Engineering, Master Academic Studies
12.	E2533	Discrete event simulation	(E20) Computing and Control Engineering, Master Academic Studies
13.	E2535	Software Algorithms in Supervisory Control and Data Acquisition Systems	(E20) Computing and Control Engineering, Master Academic Studies (E10) Power, Electronic and Telecommunication Engineering, Master Academic Studies
14.	ESI033	Advanced Power Grid Communication Protocols	(E50) Power Software Engineering, Master Academic Studies



Study Programme Accreditation

MASTER ACADEMIC STUDIES

Power Software Engineering

List of courses being held by the teacher in the accredited study programmes

ID	Course name	Study programme name, study type
15. ESI037	Smart Grid security and safety	(ES0) Power Software Engineering, Master Academic Studies
16. ESI038	Service oriented architectures in Smart Grid	(ES0) Power Software Engineering, Master Academic Studies
17. SEAM03	Software Algorithms in Supervisory Control and Data Acquisition Systems	(SE0) Software Engineering and Information Technologies, Master Academic Studies

Representative references (minimum 5, not more than 10)

1.	Lendak I., Erdeljan A. & Popović D. (2011), „Algorithm for cataloguing topologies in the Common Information Model (CIM)“, Computers and mathematics with applications, February 2011, vol 61 (3), pp. 715-721. DOI 10.1016/j.camwa.2010.12.021
2.	Vukmirović S., Erdeljan A., Čapko D., Lendak I., Nedić N. (2011), „Optimization of workflow scheduling in Utility Management System with hierarchical neural network“, International Journal of Computational Intelligence Systems, 2011, vol 4 (4), pp. 672-679.
3.	Lendak I., Ivancevic N., Vukmirovic S., Varga E., Nenadic K. & Erdeljan A. (2012), „Client Side Internet Technologies in Critical Infrastructure Systems“, International Journal of Computers, Communications & Control (IJCCC), 2012, vol 7 (5), pp. 878-890.
4.	Vukmirovic S., Erdeljan A., Lendak I. & Capko D. (2012), „Unifying the Common Information Model (CIM)“, Revue Roumaine des Sciences Techniques-Serie Electrotechnique et Energetique, 2012, vol 57 (3), pp. 301-310.
5.	Vukmirovic S., Erdeljan A., Lendak I. & Capko D. (2012), „Optimal Workflow Scheduling in Critical Infrastructure Systems with Neural Networks“, Journal of Applied Research and Technology, 2012, vol 10 (2), pp. 114-121.
6.	Čapko D., Erdeljan A., Vukmirović S. & Lendak I. (2011), „A Hybrid Genetic Algorithm for Partitioning of Data Model in Distribution Management Systems“, Information Technology and Control, 2011, vol 40 (4), pp. 316-322.
7.	Vukmirović S., Erdeljan A., Lendak I. & Čapko D. (2011), „Extension of the Common Information Model with Virtual Meter“, Electronics and electrical engineering, ISSN 1392 – 1215, 2011, vol 1 (111), pp. 59-64.
8.	Vukmirović S., Erdeljan A., Lendak I. & Čapko D. (2010), „A novel software architecture for smart metering systems“, Journal of Scientific & Industrial Research, December 2010, vol 69, pp. 937-941.
9.	Nedić N., Vukmirović S., Erdeljan A., Lendak I. & Čapko D. (2010), „A genetic algorithm approach for utility management system workflow scheduling“, Information technology and control, 2010, vol 39 (4), pp. 310-319.
10.	Erdeljan A., Lendak I., Vukmirović S. & Čapko D. (2007), „Otvorena softverska arhitektura za modeliranje, simulaciju i upravljanje distributivnim vodovodnim sistemima“, Vodoprivreda, 2007, ISSN 0350-0519, vol 229-230, pp. 291-302.

Summary data for teacher's scientific or art and professional activity:

Quotation total :	25		
Total of SCI(SSCI) list papers :	9		
Current projects :	Domestic :	1	International : 1

	UNIVERSITY OF NOVI SAD FACULTY OF TECHNICAL SCIENCES 21000 NOVI SAD, TRG DOSITEJA OBRADOVIĆA 6	
	Study Programme Accreditation MASTER ACADEMIC STUDIES Power Software Engineering	

Science, arts and professional qualifications

Name and last name:	Luković S. Ivan		
Academic title:	Full Professor		
Name of the institution where the teacher works full time and starting date:	Faculty of Technical Sciences - Novi Sad 18.05.1991		
Scientific or art field:	Applied Computer Science and Informatics		
Academic career	Year	Institution	Field
Academic title election:	2006	Faculty of Technical Sciences - Novi Sad	Applied Computer Science and Informatics
PhD thesis	1996	Faculty of Technical Sciences - Novi Sad	Applied Computer Science and Informatics
Magister thesis	1993	School of Electrical Engineering - Beograd	Applied Computer Science and Informatics
Bachelor's thesis	1990	Military-Technical Faculty - Zagreb	Applied Computer Science and Informatics

List of courses being held by the teacher in the accredited study programmes

	ID	Course name	Study programme name, study type
1.	E2I40	Database Systems	(E20) Computing and Control Engineering, Undergraduate Academic Studies (MR0) Measurement and Control Engineering, Undergraduate Academic Studies (SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies (SEL) Software Engineering and Information Technologies - Loznica, Undergraduate Academic Studies
2.	E2I41	Information System Engineering	(E20) Computing and Control Engineering, Undergraduate Academic Studies (SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies
3.	GI205	Information Systems and Databases	(GI0) Geodesy and Geomatics, Undergraduate Academic Studies
4.	GI408A	Geospatial Databases	(GI0) Geodesy and Geomatics, Undergraduate Academic Studies
5.	RI43A	Databases 1	(E20) Computing and Control Engineering, Undergraduate Academic Studies (ES0) Power Software Engineering, Undergraduate Academic Studies (MR0) Measurement and Control Engineering, Undergraduate Academic Studies
6.	RI43B	Databases 2	(E20) Computing and Control Engineering, Undergraduate Academic Studies (SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies
7.	0RI43B	Databases 2	(ES0) Power Software Engineering, Undergraduate Academic Studies
8.	BM118E	Databases	(BM0) Biomedical Engineering, Undergraduate Academic Studies
9.	EE417A	Databases	(E10) Power, Electronic and Telecommunication Engineering, Undergraduate Academic Studies
10.	SE0013	Data Organization	(SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies (SEL) Software Engineering and Information Technologies - Loznica, Undergraduate Academic Studies
11.	SE0016	Databases	(SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies (SEL) Software Engineering and Information Technologies - Loznica, Undergraduate Academic Studies
12.	E2502	Data Warehouse Systems	(E20) Computing and Control Engineering, Master Academic Studies (SE0) Software Engineering and Information Technologies, Master Academic Studies (E10) Power, Electronic and Telecommunication Engineering, Master Academic Studies



Study Programme Accreditation

MASTER ACADEMIC STUDIES

Power Software Engineering

List of courses being held by the teacher in the accredited study programmes

ID	Course name	Study programme name, study type
13. E2517	Database Management Systems	(E20) Computing and Control Engineering, Master Academic Studies (E50) Power Software Engineering, Master Academic Studies (MR0) Measurement and Control Engineering, Master Academic Studies (SE0) Software Engineering and Information Technologies, Master Academic Studies (E10) Power, Electronic and Telecommunication Engineering, Master Academic Studies
14. E2518	Software Based Business Process Modeling	(E20) Computing and Control Engineering, Master Academic Studies (SE0) Software Engineering and Information Technologies, Master Academic Studies
15. E2530	Domain Specific Modeling and Languages	(E20) Computing and Control Engineering, Master Academic Studies (SE0) Software Engineering and Information Technologies, Master Academic Studies
16. DRNI02	Selected Topics in Advanced Software Architecture	(E20) Computing and Control Engineering, Doctoral Academic Studies
17. DRNI04	Selected Topics in Database Management	(E20) Computing and Control Engineering, Doctoral Academic Studies
18. DRNI05	Selected Topics in Software Standardization and Quality	(E20) Computing and Control Engineering, Doctoral Academic Studies (F20) Engineering Animation, Doctoral Academic Studies
19. DRNI08	Selected Topics in Information Systems	(E20) Computing and Control Engineering, Doctoral Academic Studies

Representative references (minimum 5, not more than 10)

1.	Luković I., Ivančević V., Čeliković M., Aleksić S.: DSLs in Action with Model Based Approaches to Information System Development, in the book: Formal and Practical Aspects of Domain-Specific Languages: Recent Developments; Chapter 17., IGI Global, USA, 2013, pp. 502-532, ISBN 978-1-4666-2092-6.
2.	Luković I.: From the Synthesis Algorithm to the Model Driven Transformations in Database Design, 10. International Scientific Conference on Informatics, Herlany: Slovak Society for Applied Cybernetics and Informatics and Technical University of Košice - Faculty of Electrical Engineering and Informatics, 23-25 Novembar, 2009, pp. 9-18, ISBN 978-80-8086-126-1. (Invited paper).
3.	Luković I.: Application of Information System Development Tools and Methods - Some Experiences from Industry and Research Projects in Serbia, 9. International Business Informatics Conference – Symposium on Business Informatics in Central and Eastern Europe, Vienna: Austrian Computer Society and University of Vienna, 25-27 Februar, 2009, pp. 119-128, ISBN 978-3-85403-242-7. (Invited paper).
4.	Luković I: An Approach to Specification and Generation of Software Systems using Form Types, 2nd Conference on Compilers, Related Technologies and Applications (CoRTA 2008), July 11, 2008, Braganca, Portugal, Proceedings, Polytechnic Institute of Braganca, Portugal, ISBN: 978-972-745-096-1, pp. 4. (Invited talk).
5.	Mogin P, Luković I, Govedarica M: Principi projektovanja baza podataka, II izdanje, Univerzitet u Novom Sadu, Fakultet tehničkih nauka, Novi Sad, 2004, ISBN: 86-80249-81-5, 700 str.
6.	Mogin P, Luković I: Principi baza podataka, Univerzitet u Novom Sadu, Fakultet tehničkih nauka i MP "Stylos", Novi Sad, 1996, 350 str.
7.	Obrenović N., Aleksić S., Popović A., Luković I.: Transformations of Check Constraint PIM Specifications, COMPUTING AND INFORMATICS, SLOVAK ACADEMY OF SCIENCES, ISSN 1335-9150, 2012, Vol. 31, No. 5, pp. 1045-1079.
8.	Luković I, Mogin P, Pavićević J, Ristić S, "An Approach to Developing Complex Database Schemas Using Form Types", Software: Practice and Experience, John Wiley & Sons Inc, Hoboken, USA, ISSN: 0038-0644, DOI: 10.1002/spe.820, Vol. 37, No. 15, 2007, pp. 1621-1656.
9.	Luković I., Pereira Varanda M., Oliveira N., Cruz D., Henriques Rangel P.: A DSL for PIM Specifications: Design and Attribute Grammar based Implementation, Computer Science and Information Systems (ComSIS), ISSN 1820-0214, 2011, Vol. 8, No 2, pp. 379-403.
10.	Čeliković M., Luković I., Aleksić S., Ivančević V.: A MOF based Meta-Model and a Concrete DSL Syntax of IIS*Case PIM Concepts, Computer Science and Information Systems, ISSN 1820-0214, 2012, Vol. 9, No 3, pp. 1075-1103.

Summary data for teacher's scientific or art and professional activity:

Quotation total :	22
Total of SCI(SSCI) list papers :	5
Current projects :	Domestic : 1 International : 0

	UNIVERSITY OF NOVI SAD FACULTY OF TECHNICAL SCIENCES 21000 NOVI SAD, TRG DOSITEJA OBRADOVIĆA 6	
	Study Programme Accreditation MASTER ACADEMIC STUDIES Power Software Engineering	

Science, arts and professional qualifications

Name and last name:	Mihajlović R. Dragan		
Academic title:	Associate Professor		
Name of the institution where the teacher works full time and starting date:	Faculty of Technical Sciences - Novi Sad 24.09.1990		
Scientific or art field:	Applied Computer Science and Informatics		
Academic carieer	Year	Institution	Field
Academic title election:	2009	Faculty of Technical Sciences - Novi Sad	Applied Computer Science and Informatics
PhD thesis	1988	Faculty of Electrical Engineering - Sarajevo	Applied Computer Science and Informatics
Bachelor's thesis	1973	Faculty of Electrical Engineering - Sarajevo	Applied Computer Science and Informatics
Magister thesis	1070	Faculty of Electrical Engineering - Sarajevo	Electrical and Computer Engineering

List of courses being held by the teacher in the accredited study programmes

	ID	Course name	Study programme name, study type
1.	AU54	Geoinformation Systems	(E20) Computing and Control Engineering, Undergraduate Academic Studies (GI0) Geodesy and Geomatics, Undergraduate Academic Studies
2.	E243	Human Computer Interaction	(E20) Computing and Control Engineering, Undergraduate Academic Studies (SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies (SEL) Software Engineering and Information Technologies - Loznica, Undergraduate Academic Studies
3.	GI029	Utility Information Systems and their Application	(GI0) Geodesy and Geomatics, Undergraduate Academic Studies
4.	GI205	Information Systems and Databases	(GI0) Geodesy and Geomatics, Undergraduate Academic Studies
5.	RI43A	Databases 1	(E20) Computing and Control Engineering, Undergraduate Academic Studies (ES0) Power Software Engineering, Undergraduate Academic Studies (MR0) Measurement and Control Engineering, Undergraduate Academic Studies
6.	RI43B	Databases 2	(E20) Computing and Control Engineering, Undergraduate Academic Studies (SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies
7.	RI4A	Computer Graphics	(E20) Computing and Control Engineering, Undergraduate Academic Studies (ES0) Power Software Engineering, Undergraduate Academic Studies (F10) Engineering Animation, Undergraduate Academic Studies (SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies (SEL) Software Engineering and Information Technologies - Loznica, Undergraduate Academic Studies
8.	0RI43B	Databases 2	(ES0) Power Software Engineering, Undergraduate Academic Studies
9.	BM118E	Databases	(BM0) Biomedical Engineering, Undergraduate Academic Studies
10.	E0243	Human-Computer Interaction	(ES0) Power Software Engineering, Undergraduate Academic Studies (F10) Engineering Animation, Undergraduate Academic Studies
11.	EE417A	Databases	(E10) Power, Electronic and Telecommunication Engineering, Undergraduate Academic Studies



Study Programme Accreditation

MASTER ACADEMIC STUDIES

Power Software Engineering

List of courses being held by the teacher in the accredited study programmes

ID	Course name	Study programme name, study type
12. E2505	Multimedia Systems	(E20) Computing and Control Engineering, Master Academic Studies (ES0) Power Software Engineering, Master Academic Studies (F20) Engineering Animation, Master Academic Studies (SE0) Software Engineering and Information Technologies, Master Academic Studies
13. E2516	Virtual Reality Systems	(E20) Computing and Control Engineering, Master Academic Studies (SE0) Software Engineering and Information Technologies, Master Academic Studies
14. FDS151	Selected Chapters in Multimedia	(F00) Graphic Engineering and Design, Doctoral Academic Studies

Representative references (minimum 5, not more than 10)

1.	Mihajlović D., Informacioni sistemi i projektovanje baza podataka, FTN Novi Sad, 1998
2.	Mihajlović D, Obradović D, Jedan algoritam sažimanja srpskohrvatskih reči, Informatika br 4, pp45-47, 1982
3.	Mihajlović D, Obradović D, An evaluation of textual documents indexing methods, Yujor, 1992, pp107-112.
4.	Mihajlović D i ostali, Softversko rešenje za farmaceutski informacioni sistem, Diskobolos 97.
5.	Mihajlović D, Kecman Ž, Farmaceutski informacioni sistem, I kongres farmaceuta Jugoslavije, Vrnjačka Banja, 1994
6.	Mihajlović D, Izbor parova leksičkih jedinica iz poznatog rečnika za automatizovano postavljanje relacija u tezaurusu
7.	Mihajlović D, Odredjivanje vrsta reči iz srpskohrvatskog jezika primenom računara, Informatica, br 1, pp52-54, 1988
8.	Perišić B, Obradović D, Mihajlović D, Standardizacija metodologije projektovanja informacionih sistema software-inženjerski aspekti, Standardizacija i kvalitet u informacionim tehnologijama, beograd 1995.
9.	Mihajlović D, Nićin V, Prilog razvoju automastke obrade informacija u INDOK-delatnosti u organima uprave, Dani informatike 80, pp73-83, Novi Sad
10.	Obradović D, Perišić B, Mihajlović D, Konjović Z, Stanje i trendovi u projektovanju informacionih sistema, IPME, Beograd, 1992



Summary data for teacher's scientific or art and professional activity:

Quotation total :	
Total of SCI(SSCI) list papers :	
Current projects :	Domestic : <input type="text"/> International : <input type="text"/>

	UNIVERSITY OF NOVI SAD FACULTY OF TECHNICAL SCIENCES 21000 NOVI SAD, TRG DOSITEJA OBRADOVIĆA 6	
	Study Programme Accreditation MASTER ACADEMIC STUDIES Power Software Engineering	

Science, arts and professional qualifications

Name and last name:		Nimrihter D. Miroslav	
Academic title:		Associate Professor	
Name of the institution where the teacher works full time and starting date:		Faculty of Technical Sciences - Novi Sad 01.06.1976	
Scientific or art field:		Electroenergetics	
Academic carieer	Year	Institution	Field
Academic title election:	2009		Electroenergetics
PhD thesis	1994	School of Electrical Engineering - Beograd	Electroenergetics
Magister thesis	1984	School of Electrical Engineering - Beograd	Electroenergetics
Bachelor's thesis	1975	School of Electrical Engineering - Beograd	Electroenergetics
List of courses being held by the teacher in the accredited study programmes			
	ID	Course name	Study programme name, study type
1.	EE309	Power Distribution Systems	(E10) Power, Electronic and Telecommunication Engineering, Undergraduate Academic Studies
2.	EE409	High Voltage Engineering	(E10) Power, Electronic and Telecommunication Engineering, Undergraduate Academic Studies
3.	EE413	Power System Reliability	(E10) Power, Electronic and Telecommunication Engineering, Undergraduate Academic Studies
4.	EE309	Power Distribution Systems	(E10) Power, Electronic and Telecommunication Engineering, Undergraduate Academic Studies
5.	ESI020	Data structures and algorithms in power systems	(E00) Power Software Engineering, Undergraduate Academic Studies
6.	DE106S	Reliability of Power Systems	(E11) Power, Electronic and Telecommunication Engineering, Specialised Academic Studies
7.	DE112S	Non-deterministic Modelling	(E11) Power, Electronic and Telecommunication Engineering, Specialised Academic Studies
8.	EE560	Planiranje elektroenergetskih sistema	(E10) Power, Electronic and Telecommunication Engineering, Master Academic Studies
9.	EE409M	High Voltage Engineering	(E10) Power, Electronic and Telecommunication Engineering, Master Academic Studies
10.	EM435A	Electronic Systems in Oil Industry	(E10) Power, Electronic and Telecommunication Engineering, Master Academic Studies
11.	EM437A	The application of electronic systems in clean and renewable energy	(E10) Power, Electronic and Telecommunication Engineering, Master Academic Studies
12.	ESI022	Quality control and assurance of electric power software	(E00) Power Software Engineering, Master Academic Studies
13.	ESI024	Applied algorithms in power systems	(E00) Power Software Engineering, Master Academic Studies
14.	ESI025	Simulation of Power Greed critical mission systems	(E00) Power Software Engineering, Master Academic Studies
15.	ESI027	Advanced cloud computing in power systems	(E00) Power Software Engineering, Master Academic Studies
16.	ESI030	Distributed Software Architectures for Smart Energy Grids	(E00) Power Software Engineering, Master Academic Studies
17.	ESI031	Business Intelligence and Data Warehouse Systems in Power Systems	(E00) Power Software Engineering, Master Academic Studies
18.	ESI035	Computer graphic algorithms for smart grid systems	(E00) Power Software Engineering, Master Academic Studies
19.	ESI038	Service oriented architectures in Smart Grid	(E00) Power Software Engineering, Master Academic Studies
20.	DE106	Reliability of Power Systems	(E10) Power, Electronic and Telecommunication Engineering, Doctoral Academic Studies (OM1) Mathematics in Engineering, Doctoral Academic Studies
21.	DE112	Non-deterministic Modelling	(E10) Power, Electronic and Telecommunication Engineering, Doctoral Academic Studies
Representative references (minimum 5, not more than 10)			

	UNIVERSITY OF NOVI SAD FACULTY OF TECHNICAL SCIENCES 21000 NOVI SAD, TRG DOSITEJA OBRADOVIĆA 6		
	Study Programme Accreditation MASTER ACADEMIC STUDIES Power Software Engineering		
Representative references (minimum 5, not more than 10)			
1.	Gušavac S., Nimrihter M., Gerić Lj.: ESTIMATION OF OVERHEAD LINE CONDITION, , Electric Power System Research, 2008, Vol. 78, pp. 566-583		
2.	Desnica V., Živanov Lj., Aleksić S., Nimrihter M.: Comparative Characteristics of Thick-Film Integrated LC Filters, IEEE Transactions on Instrumentation and Measurement, 2002, Vol. 51, No 4, pp. 570-576, ISSN 0018-9456		
3.	Nimrihter M.: Comparative Analysis of Security Concepts for Urban Medium Voltage Cable Distribution Networks, Electric Power System Research, 1994, No 29, pp. 43-50, ISSN 0378-7796		
4.	Popović D., Glamočić Lj., Nimrihter M.: The Optimal Automation Level of Medium Voltage Distribution Networks, International Journal of Electrical Power		
5.	Nimrihter M.: Comparative Analysis of Security Concepts for Urban Medium Voltage Cable Distribution Networks, Electric Power Research, 1994, No 29, pp. 43-50		
6.	Nimrihter M., Živanov M., Gušavac S.: FUEL CELLS – ECOLOGICAL COGENERATIVE ENERGY SOURCES, 9th INTERNATIONAL SYMPOSIUM INTERDISCIPLINARY REGIONAL RESEARCH – ISIRR 2007, , Novi Sad, 21-22 Jun, 2007		
7.	*****Živanov M., Nimrihter M., Živanov Lj.: Energetska efikasnost sistema sa gorivnim ćelijama Naziv skupa: Međunarodno savetovanje ENERGETIKA 2007 , UDK: UDC 621.311.29.001.5/.004:620.92		
8.	*****Živanov M., Nimrihter M., Živanov Lj.: Efekti primene gorivnih ćelija Naziv skupa: Međunarodno savetovanje ENERGETIKA 2007 , UDK: 621.311.29.001.5/.004:620.92		
9.	*****Nimrihter M., Gušavac S., Lukić J., Kuljić R.: Uticaj distribuiranih generatora na rizik u SN DEM, edukativni softver za potrebe CEFES magistarski studija Naziv skupa: 14th International Symposium on Power Electronics - Ee 2007 , UDK: 621.38; 620.9(082)		
10.	*****Nimrihter M., Gušavac S., Lukić J.: Uticaj distribuiranih protočnih elektrana na rizik napajanja potrošača Naziv skupa: 14. International Symposium on Power Electronics-Ee2007 , UDK: 621.38; 620.9(082)		
Summary data for teacher's scientific or art and professional activity:			
Quotation total :		22	
Total of SCI(SSCI) list papers :		5	
Current projects :		Domestic :	3
		International :	12

	UNIVERSITY OF NOVI SAD FACULTY OF TECHNICAL SCIENCES 21000 NOVI SAD, TRG DOSITEJA OBRADOVIĆA 6	
	Study Programme Accreditation MASTER ACADEMIC STUDIES Power Software Engineering	

Science, arts and professional qualifications

Name and last name:	Obradović J. Đorđe		
Academic title:	Assistant Professor		
Name of the institution where the teacher works full time and starting date:	Faculty of Technical Sciences - Novi Sad 01.07.1998		
Scientific or art field:	Applied Computer Science and Informatics		
Academic career	Year	Institution	Field
Academic title election:	2011	Faculty of Technical Sciences - Novi Sad	Applied Computer Science and Informatics
PhD thesis	2011		Applied Computer Science and Informatics
Magister thesis	2003	Faculty of Technical Sciences - Novi Sad	Computer Science
Bachelor's thesis	1997	Faculty of Technical Sciences - Novi Sad	Applied Computer Science and Informatics

List of courses being held by the teacher in the accredited study programmes

	ID	Course name	Study programme name, study type
1.	E236A	Computational Intelligence Fundamentals	(E20) Computing and Control Engineering, Undergraduate Academic Studies (SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies (SEL) Software Engineering and Information Technologies - Loznica, Undergraduate Academic Studies
2.	E2K40A	Soft Computing	(E20) Computing and Control Engineering, Undergraduate Academic Studies (MR0) Measurement and Control Engineering, Undergraduate Academic Studies (SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies (SEL) Software Engineering and Information Technologies - Loznica, Undergraduate Academic Studies
3.	ISIT26	Upravljanje projektima	(SII) Software and Information Technologies (Indija), Undergraduate Professional Studies
4.	ISIT30	Business process management systems	(SII) Software and Information Technologies (Indija), Undergraduate Professional Studies
5.	ISIT41	eGovernment technologies and systems	(SII) Software and Information Technologies (Indija), Undergraduate Professional Studies
6.	SE0006	Object oriented programming 1	(SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies (SEL) Software Engineering and Information Technologies - Loznica, Undergraduate Academic Studies
7.	SE0013	Data Organization	(SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies (SEL) Software Engineering and Information Technologies - Loznica, Undergraduate Academic Studies
8.	SE239A	Web programming	(P00) Production Engineering, Undergraduate Academic Studies (SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies (SEL) Software Engineering and Information Technologies - Loznica, Undergraduate Academic Studies
9.	E2511	Fuzzy Systems	(E20) Computing and Control Engineering, Master Academic Studies (ES0) Power Software Engineering, Master Academic Studies (SE0) Software Engineering and Information Technologies, Master Academic Studies (E10) Power, Electronic and Telecommunication Engineering, Master Academic Studies



Study Programme Accreditation

MASTER ACADEMIC STUDIES

Power Software Engineering

List of courses being held by the teacher in the accredited study programmes

ID	Course name	Study programme name, study type
10. E2512	Neural Networks	(E20) Computing and Control Engineering, Master Academic Studies (SE0) Software Engineering and Information Technologies, Master Academic Studies (E10) Power, Electronic and Telecommunication Engineering, Master Academic Studies
11. EP002	EBusiness technologies and systems	(I20) Engineering Management, Specialised Professional Studies (IB0) Engineering Management - MBA, Specialised Professional Studies
12. E2536	Mobile Application Development	(E20) Computing and Control Engineering, Master Academic Studies (SE0) Software Engineering and Information Technologies, Master Academic Studies
13. DRNI07	Selected Chapters in Computational Intelligence	(E20) Computing and Control Engineering, Doctoral Academic Studies (OM1) Mathematics in Engineering, Doctoral Academic Studies
14. DRNI14	Selected Chapters in Machine Learning	(E20) Computing and Control Engineering, Doctoral Academic Studies
15. DRNI17	Selected Topics in ICT enhanced learning	(E20) Computing and Control Engineering, Doctoral Academic Studies (OM1) Mathematics in Engineering, Doctoral Academic Studies
16. DRNI18	Selected Topics in Distributed/Mobile computing	(E20) Computing and Control Engineering, Doctoral Academic Studies (F20) Engineering Animation, Doctoral Academic Studies

Representative references (minimum 5, not more than 10)

1.	Konjović Z., Obradović Đ., Racković M., Object oriented implementation of the neural network training system, Proc. Of Seventh IFSA '97 World Congress, Prague 1997.
2.	Obradović Đ. Jovanović D., Konjović Z., Govedarica M., Web based software system supporting detection of topographical symbols, InterGeoEast 2006.
3.	Obradović Đ. Racković M., Algorithmic Structure for Representation of the Various Neural Network Models, XI Conference on Applied Mathematics PRIM '96 Budva 1996.
4.	Konjović Z., Fišl I., Obradović Đ., "Specification of the language for reporting in library information system", YuInfo'98, Kopaonik 1998.
5.	Obradović Đ., Konjović Z., "The system for the computer supported testing students knowledge", YuInfo'99, Kopaonik 1999.
6.	Šolajić D., Obradović Đ., Konjović Z., "Reengineering in the anthropomorphic gait simulation system", PRIM 2000
7.	Obradović Đ., Konjović Z., "Anthropomorphic Gait Simulation System", PRIM 2000
8.	Obradović Đ., Šolajić D., Konjović Z. "Softverski sistem za administriranje procesa izvođenja nastave", YUINFO 2004
9.	Šolajić D., Obradović Đ., Konjović Z., "Web bazirana aplikacija za podršku razvoju softverskog projekta" YUINFO 2004
10.	Jovanović D., Obradović Đ., Konjović Z., Govedarica M., Softverski sistem za detekciju topografskih znakova na kartama i mapama, YuInfo, Kopaonik 2005.

Summary data for teacher's scientific or art and professional activity:

Quotation total :	0
Total of SCI(SSCI) list papers :	0
Current projects :	Domestic : 0 International : 0

	UNIVERSITY OF NOVI SAD FACULTY OF TECHNICAL SCIENCES 21000 NOVI SAD, TRG DOSITEJA OBRADOVIĆA 6	
	Study Programme Accreditation MASTER ACADEMIC STUDIES Power Software Engineering	

Science, arts and professional qualifications

Name and last name:	Pavlica N. Vladimir		
Academic title:	Assistant Professor		
Name of the institution where the teacher works full time and starting date:	Faculty of Technical Sciences - Novi Sad 01.11.2012		
Scientific or art field:	Computer Science		
Academic career	Year	Institution	Field
Academic title election:	2012	Faculty of Technical Sciences - Novi Sad	Computer Science
PhD thesis	1997	Faculty of Technical Sciences - Novi Sad	Automatic Control and System Engineering
Magister thesis	1991	School of Electrical Engineering - Beograd	Automatic Control and System Engineering
Bachelor's thesis	1989	Faculty of Technical Sciences - Novi Sad	Unknown

List of courses being held by the teacher in the accredited study programmes

	ID	Course name	Study programme name, study type
1.	ESI003	Electric power software development	(ES0) Power Software Engineering, Undergraduate Academic Studies
2.	ESI006	Introduction to critical mission software for power grids	(ES0) Power Software Engineering, Undergraduate Academic Studies
3.	ESI012	Smart Grid Networks	(ES0) Power Software Engineering, Undergraduate Academic Studies
4.	ESI014	Integration of power systems	(ES0) Power Software Engineering, Undergraduate Academic Studies
5.	ESI016	Smart Grid Programming	(ES0) Power Software Engineering, Undergraduate Academic Studies
6.	ESI043	Optimization Methods in Power Engineering	(ES0) Power Software Engineering, Undergraduate Academic Studies
7.	ESI022	Quality control and assurance of electric power software	(ES0) Power Software Engineering, Master Academic Studies
8.	ESI024	Applied algorithms in power systems	(ES0) Power Software Engineering, Master Academic Studies
9.	ESI025	Simulation of Power Greed critical mission systems	(ES0) Power Software Engineering, Master Academic Studies
10.	ESI027	Advanced cloud computing in power systems	(ES0) Power Software Engineering, Master Academic Studies
11.	ESI029	Simulation of power grid critical mission systems	(ES0) Power Software Engineering, Master Academic Studies
12.	ESI030	Distributed Software Architectures for Smart Energy Grids	(ES0) Power Software Engineering, Master Academic Studies
13.	ESI031	Business Intelligence and Data Warehouse Systems in Power Systems	(ES0) Power Software Engineering, Master Academic Studies
14.	ESI034	Multi-tier applications development in Smart Grids	(ES0) Power Software Engineering, Master Academic Studies
15.	ESI035	Computer graphic algorithms for smart grid systems	(ES0) Power Software Engineering, Master Academic Studies
16.	ESI037	Smart Grid security and safety	(ES0) Power Software Engineering, Master Academic Studies
17.	ESI038	Service oriented architectures in Smart Grid	(ES0) Power Software Engineering, Master Academic Studies

Representative references (minimum 5, not more than 10)

1.	D. Petrovački, S. Odri, A. Erdeljan, V. Pavlica, J. Grbović: "Research and Industrial Activities of the Laboratory for Automatic Control", ("Contemporary Problems in Power Engineering" edited by D. Gvozdenac, J. Xypteras, M. Dimić), Fakultet tehničkih nauka, Novi Sad, 1996., (S print), ISSN-0354-8449 CIP- Katalogizacija u publikaciji Biblioteke matice srpske, pp. 299-318.
2.	S.Odri, V.Pavlica, N.Jorgovanović, J.Grbović: "Hardware elements of scada neuron", ("Contemporary Problems in Power Engineering" edited by D. Gvozdenac, J. Xypteras, M. Dimić), Fakultet tehničkih nauka, Novi Sad, 1996., (S print), ISSN-0354-8449 CIP- Katalogizacija u publikaciji Biblioteke matice srpske, pp. 333-336.
3.	V.Pavlica, D.Petrovački: "About simple fuzzy control and fuzzy control based on fuzzy relational equations", International Journal FUZZY SETS AND SYSTEMS, Elsevier-Science, Amsterdam, 1999, Vol 101, pp 41-47.
4.	V.Pavlica, D.Petrovački, S.Odri: "Optimal PID-fuzzy hybrid controller", Journal of Automatic Control, Faculty of Electrical Engineering, Beograd, Vol 7, pp 27-32, 1997.



UNIVERSITY OF NOVI SAD

FACULTY OF TECHNICAL SCIENCES 21000 NOVI SAD, TRG DOSITEJA OBRADOVIĆA 6

**Study Programme Accreditation**

MASTER ACADEMIC STUDIES

Power Software Engineering

Representative references (minimum 5, not more than 10)

5.	V. Pavlica, D. Petrovački, "Temperature control with PID-Fuzzy Hybrid Controller", 14th ISPE/IEEE/IFAC International conference on CAD/CAM, robotics & factories of the future CARS & FOF'98, pp. 165-170, Pereira, Colombia, 1998.
6.	V. Pavlica, D. Petrovački, "An Application of PID-Fuzzy Hybrid Controller", Proceeding of the 1998 IEEE International conference on control application, Trieste, Italy, 1998, pp 629-632.
7.	V.Pavlica, A.Erdeljan, T.Popović: "Some variants of the genetic algorithm", World congress on neural network WCNN'96, San Diego, CA, 1996.
8.	V.Pavlica, D.Petrovački, T.Popović, S.Odri: "The PID-fuzzy hybrid controller", Proceeding of the 12th ISPE/IEEE/IFAC International conference on CAD/CAM, robotics & factories of the future CARS & FOF'96, London, UK, 1996, pp 375-380.
9.	V.Pavlica, D.Petrovački, A.Erdeljan, T.Popović: "Some Modifications of the Genetic Optimization Algorithm" The second international Conference on Technical Informatics CONTI'96, Timisoara, Romania, 1996.
10.	V. Pavlica, A. Erdeljan: "The GLS learning algorithm for multilayer neural network", 1995 IEEE International conference on neural networks, ICNN'95, Perth, Australia, 1995.

Summary data for teacher's scientific or art and professional activity:

Quotation total :	14		
Total of SCI(SSCI) list papers :	1		
Current projects :	Domestic :	0	International : 0

	UNIVERSITY OF NOVI SAD FACULTY OF TECHNICAL SCIENCES 21000 NOVI SAD, TRG DOSITEJA OBRADOVIĆA 6	
	Study Programme Accreditation MASTER ACADEMIC STUDIES Power Software Engineering	

Science, arts and professional qualifications

Name and last name:	Suvajdzin Rakić B. Zorica		
Academic title:	Assistant Professor		
Name of the institution where the teacher works full time and starting date:	Faculty of Technical Sciences - Novi Sad 01.12.1998		
Scientific or art field:	Applied Computer Science and Informatics		
Academic career	Year	Institution	Field
Academic title election:	2008	Faculty of Technical Sciences - Novi Sad	Applied Computer Science and Informatics
PhD thesis	2008	Faculty of Technical Sciences - Novi Sad	Computer Science
Magister thesis	2000	Faculty of Technical Sciences - Novi Sad	Applied Computer Science and Informatics
Bachelor's thesis	1998	Faculty of Technical Sciences - Novi Sad	Applied Computer Science and Informatics

List of courses being held by the teacher in the accredited study programmes

	ID	Course name	Study programme name, study type
1.	E225	Operating Systems	(E20) Computing and Control Engineering, Undergraduate Academic Studies (ES0) Power Software Engineering, Undergraduate Academic Studies
2.	E234	Compilers	(E20) Computing and Control Engineering, Undergraduate Academic Studies (ES0) Power Software Engineering, Undergraduate Academic Studies (MR0) Measurement and Control Engineering, Undergraduate Academic Studies
3.	EE301	Operating Systems and Competitive Programming	(MR0) Measurement and Control Engineering, Undergraduate Academic Studies (E10) Power, Electronic and Telecommunication Engineering, Undergraduate Academic Studies
4.	H207	Programming and Programming Languages	(F10) Engineering Animation, Undergraduate Academic Studies (H00) Mechatronics, Undergraduate Academic Studies (S01) Postal Traffic and Telecommunications, Undergraduate Academic Studies
5.	ISIT12	Osnove informacionih sistema	(SII) Software and Information Technologies (Indija), Undergraduate Professional Studies
6.	ISIT22	Osnove baza podataka	(SII) Software and Information Technologies (Indija), Undergraduate Professional Studies
7.	SE0034	Compilers	(SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies
8.	E2505	Multimedia Systems	(E20) Computing and Control Engineering, Master Academic Studies (ES0) Power Software Engineering, Master Academic Studies (F20) Engineering Animation, Master Academic Studies (SE0) Software Engineering and Information Technologies, Master Academic Studies
9.	F402	Electronic Publishing	(F00) Graphic Engineering and Design, Master Academic Studies
10.	DRNI08	Selected Topics in Information Systems	(E20) Computing and Control Engineering, Doctoral Academic Studies

Representative references (minimum 5, not more than 10)

1.	Rakić P., Milašinović D., Živanov Ž., Suvajdzin Rakić Z., Nikolić M., Hajduković M.: MPI-CUDA parallelization of a finite-strip program for geometric nonlinear analysis: A hybrid approach, Advances in Engineering Software, 2011, Vol. 42, No 5, pp. 273-285, ISSN 0965-9978
2.	Zorica Suvajdzin, Miroslav Hajduković, A Structure Editor for the Program Composing Assistant, Computer Science and Information Systems, Volume 3, Number 1, Beograd, jun 2006., pp 65-76
3.	Miroslav Hajduković, Zorica Suvajdzin, Žarko Živanov, Character oriented program editing - habit or necessity, Novi Sad Journal of mathematics, vol. 33, no. 1, Novi Sad, 2003., pp 53-65



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**Study Programme Accreditation**

MASTER ACADEMIC STUDIES

Power Software Engineering

Representative references (minimum 5, not more than 10)

4.	Hajduković M., Suvajdžin Z., Živanov Ž. Naziv: A problem of program execution time measurement Naziv časopisa: Novi Sad Journal of mathematics , Novi Sad Journal of Mathematics, 2003, Vol. 33, No 1, pp. 67-73, ISSN 1450-5444, UDK: 51
5.	Rakić P., Stričević L., Suvajdžin Rakić Z.: Statically Typed Matrix: in C library, 5. Balkan Conference in Informatics, Novi Sad: ACM, 16-20 Septembar, 2012, pp. 217-222
6.	Milašinović D., Živanov Ž., Rakić P., Suvajdžin Rakić Z., Nikolić M., Hajduković M., Borković A., Milaković I.: A Finite-Strip Analysis of Nonlinear Shear-Lag Effect Supported by Automatic Visualization
7.	Suvajdžin Rakić Z., Rakić P.: Computers and Education, 1. VIPSI, Nepoznato, 3-4 April, 2009, ISBN 86-7466-117-3
8.	Zorica Suvajdžin, Miroslav Hajduković, Program Composing Assistant For Novice Programmers, The ASEE Mid-Atlantic Spring Conference 2006, Brooklyn NY, April 2006, abstract+5 pages (CD-ROM)
9.	Zorica Suvajdžin, Miroslav Hajduković, Towards Program Composing Assistants, Proceedings of the 2005 International Conference on Programming Languages and Compilers, PLC'05, Las Vegas, Nevada, USA, jun 2005, pp 142-147
10.	Rakić P., Živanov Ž., Suvajdžin Rakić Z., Stričević L., Hajduković M.: Characteristics of Operating System for Wireless Sensor Network Applications, 9. International Symposium Interdisciplinary Regional Research - ISIRR, Novi Sad, , pp. 50-50

Summary data for teacher's scientific or art and professional activity:

Quotation total :	0			
Total of SCI(SSCI) list papers :	0			
Current projects :	Domestic :	0	International :	0

	UNIVERSITY OF NOVI SAD FACULTY OF TECHNICAL SCIENCES 21000 NOVI SAD, TRG DOSITEJA OBRADOVIĆA 6	
	Study Programme Accreditation MASTER ACADEMIC STUDIES Power Software Engineering	

Science, arts and professional qualifications

Name and last name:	Švenda S. Goran		
Academic title:	Associate Professor		
Name of the institution where the teacher works full time and starting date:	-		
Scientific or art field:	Electroenergetics		
Academic career	Year	Institution	Field
Academic title election:	2012	Faculty of Technical Sciences - Novi Sad	Electroenergetics
PhD thesis	2001	School of Electrical Engineering - Beograd	Electroenergetics
Magister thesis	1994	School of Electrical Engineering - Beograd	Electroenergetics
Bachelor's thesis	1988	Faculty of Technical Sciences - Novi Sad	Electroenergetics

List of courses being held by the teacher in the accredited study programmes

ID	Course name	Study programme name, study type
1. EE401	Application of Computers in Power Systems 1	(E10) Power, Electronic and Telecommunication Engineering, Undergraduate Academic Studies
2. ESI003	Electric power software development	(E0) Power Software Engineering, Undergraduate Academic Studies
3. ESI043	Optimization Methods in Power Engineering	(E0) Power Software Engineering, Undergraduate Academic Studies
4. SEI002	Architecture of Distributed Systems in Power Systems	(E0) Power Software Engineering, Undergraduate Academic Studies
5. DE207S	Prelazni procesi i stabilnost u EES	(E11) Power, Electronic and Telecommunication Engineering, Specialised Academic Studies
6. DE216S	Computational Intelligence in Power Systems	(E11) Power, Electronic and Telecommunication Engineering, Specialised Academic Studies
7. EE501	Numerika i algoritmi	(M30) Energy and Process Engineering, Master Academic Studies
8. EE506	Analysis of PES 3	(E10) Power, Electronic and Telecommunication Engineering, Master Academic Studies
9. EE560	Planiranje elektroenergetskih sistema	(E10) Power, Electronic and Telecommunication Engineering, Master Academic Studies
10. DE105S	Optimization Methods in Power Engineering - II	(E11) Power, Electronic and Telecommunication Engineering, Specialised Academic Studies
11. DE217S	PES Analysis 4	(E11) Power, Electronic and Telecommunication Engineering, Specialised Academic Studies
12. EE0501	Optimization Methods in Power Systems - 1	(E10) Power, Electronic and Telecommunication Engineering, Master Academic Studies
13. EE0516	Specialized Software in Power Systems	(E0) Power Software Engineering, Master Academic Studies (E10) Power, Electronic and Telecommunication Engineering, Master Academic Studies
14. DE216	Computational Intelligence in Power Systems	(E10) Power, Electronic and Telecommunication Engineering, Doctoral Academic Studies
15. DE105	Optimization Methods in Power Engineering - II	(E10) Power, Electronic and Telecommunication Engineering, Doctoral Academic Studies

Representative references (minimum 5, not more than 10)

1.	Čapko D., Erdeljan A., Popović M., Švenda G.: An Optimal Relationship-Based Partitioning of Large Datasets, LNCS, Springer Verlag, 2010, str. 555-558, ISBN 978-3-642-15575-8
2.	Švenda G., Simendić Z., Strezoski V.: Advanced Voltage Control Integrated in DMS, INT J ELEC POWER, 2012, Vol. 43, pp. 333-343, ISSN 0142-0615
3.	Švenda G., Nahman J.: Transformer Phase Coordinate Models Extended for Grounding System Analysis, IEEE Trans. on Power Delivery, 2002, Vol. 17, No 4, pp. 1023-1029
4.	Čapko D., Erdeljan A., Švenda G., Popović M.: A Dynamic Repartitioning of Large Data Model in Distribution Management Systems, Electronics and electrical engineering, 2012, Vol. 5, No 121, pp. 1392-1215, ISSN 1392-1215
5.	Strezoski V., Popović D., Bekut D., Švenda G.: DMS – Basis for Increasing of Green Distributed Generation Penetration in Distribution Networks, Thermal Science, 2012, Vol. 1, No 16, pp. 189-203, ISSN 0354-9836
6.	Čapko D., Erdeljan A., Popović M., Švenda G.: An Optimal Initial Partitioning of Large Datasets in Utility Management Systems, Journal of Advances in Electrical and Computer Engineering, 2011, Vol. 11, No 4, pp. 41-46, ISSN 1582-7445



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**Study Programme Accreditation**

MASTER ACADEMIC STUDIES

Power Software Engineering

Representative references (minimum 5, not more than 10)

7.	Strezoski V., Švenda G., Bekut D.: Extension of the Canonical Model Application for Calculation on Power Systems Under Fault Conditions, Electrical Power
8.	Nahman J., Švenda G.: Power and Earthing System Modeling in Natural Coordinates, Electrical Power
9.	Bekut D., Švenda G., Strezoski V.: Dead Zone Phenomenon in Distance Relaying of Overhead Transmission Lines, Electrical Power System Research, 2000, No 56, pp. 1-8
10.	Nahman J., G. Svenda: Power and Earthing System Modeling in Natural Coordinates, Electrical Power And Energy Systems, ELSEVIER, 2002, No.24, pp. 541-549, ISSN 0142-0615.,
Summary data for teacher's scientific or art and professional activity:	
Quotation total :	5
Total of SCI(SSCI) list papers :	8
Current projects :	Domestic : 6 International : 14

	UNIVERSITY OF NOVI SAD FACULTY OF TECHNICAL SCIENCES 21000 NOVI SAD, TRG DOSITEJA OBRADOVIĆA 6	
	Study Programme Accreditation MASTER ACADEMIC STUDIES Power Software Engineering	

Science, arts and professional qualifications

Name and last name:		Varga D. Ervin	
Academic title:		Assistant Professor	
Name of the institution where the teacher works full time and starting date:		-	
Scientific or art field:		Electroenergetics	
Academic carieer	Year	Institution	Field
Academic title election:	2009	Faculty of Technical Sciences - Novi Sad	Electroenergetics
PhD thesis	2007	Faculty of Technical Sciences - Novi Sad	Electroenergetics
Magister thesis	1999	Faculty of Technical Sciences - Novi Sad	Computer Science
Bachelor's thesis	1994	Faculty of Technical Sciences - Novi Sad	Computer Engineering and Computer Communication
List of courses being held by the teacher in the accredited study programmes			
ID	Course name	Study programme name, study type	
1.	ESI003 Electric power software development	(ES0) Power Software Engineering, Undergraduate Academic Studies	
2.	ESI004 Cloud Computing in power systems	(ES0) Power Software Engineering, Undergraduate Academic Studies	
3.	ESI014 Integration of power systems	(ES0) Power Software Engineering, Undergraduate Academic Studies	
4.	ESI015 Distributed Computer Systems in Power Systems	(ES0) Power Software Engineering, Undergraduate Academic Studies	
5.	ESI016 Smart Grid Programming	(ES0) Power Software Engineering, Undergraduate Academic Studies	
6.	ESI018 GIS in power systems	(ES0) Power Software Engineering, Undergraduate Academic Studies	
7.	EE502 Distributed Computer System Application	(E10) Power, Electronic and Telecommunication Engineering, Master Academic Studies	
8.	ESI022 Quality control and assurance of electric power software	(ES0) Power Software Engineering, Master Academic Studies	
Representative references (minimum 5, not more than 10)			
1.	Popović D., Varga E., Perlić Z.: Extension of the Common Information Model With a Catalog of Topologies, IEEE Transactions on Power Systems, 2007, Vol. 22, No 2, pp. 770-777		
2.	Varga E.: The Holistic Approach to Software Engineering, 5. PSU-UNS International Conference on Engineering and Technology - ICET, Phuket, 2-3 Maj, 2011, pp. 334-337		
3.	Varga E., Lendak I., Gavrić M., Erdeljan A.: Applicability of RESTful Web Services in Control Center Software Integrations		
4.	Lendak I., Varga E., Erdeljan A., Gavrić M.: RESTful Access to Power System State Variables, 8. SIBIRCON, IEEE Reg. Int. Conf. on "Computational Technologies in Electrical and Electronics Engineering", Irkutsk, 11-15 Jul, 2010, pp. 450-454, ISBN 978-1-4244-7624-4		
5.	Lendak I., Varga E., Erdeljan A., Gavrić M.: RESTful Web Services and the Common Information Model (CIM), 1. IEEE International Energy Conference (ENERGYCON), Manama, ISBN 9789990171105		
6.	Varga E., Gavrić M., Hajduković M.: An overview of the object-oriented concurrent programming language CONCERT realization, 4. Balkan conference on operational research, Solun, 1 Januar, 1997		
7.	Varga E., Konjović Z., Gerić Lj.: Direktno upravljanje opterećenjem sa mogućnošću zadavanja oblika dijagrama opterećenja sistema, 2. Jugoslovensko Savetovanje o Elektrodistributivnim Mrežama, Herceg Novi, 1 Januar, 2000		
8.	Varga E.: Implementacija Baze Podataka za Rad sa Skeniranim Katalozima Proizvoda, 1. Jugoslovensko Savetovanje o elektrodistributivnim mrežama JUKO CIRED, Zlatibor, 5-8 Oktobar, 1998		
9.	Lendak I., Ivančević N., Vukmirović S., Varga E., Nenadić K. & Erdeljan A.: Client Side Internet Technologies in Critical Infrastructure Systems, International Journal of Computers, Communications & Control (IJCCC), 2012, vol 7 (5), pp. 878-890.		
10.	Sandor F. Beretka, Ervin D. Varga: Proposal of a Multi-Agent System Architecture for use in Energy Management Systems, 20th Telecommunications forum TELFOR 2012, Belgrade, Serbia, 2012.		
Summary data for teacher's scientific or art and professional activity:			
Quotation total :		18	
Total of SCI(SSCI) list papers :		1	
Current projects :		Domestic :	International :
		1	0

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	Study Programme Accreditation MASTER ACADEMIC STUDIES Power Software Engineering	

Science, arts and professional qualifications

Name and last name:	Vukmirović M. Srđan		
Academic title:	Assistant Professor		
Name of the institution where the teacher works full time and starting date:	Faculty of Technical Sciences - Novi Sad 20.11.2000		
Scientific or art field:	Automatic Control and System Engineering		
Academic carieer	Year	Institution	Field
Academic title election:	2012	Faculty of Technical Sciences - Novi Sad	Automatic Control and System Engineering
PhD thesis	2011	Faculty of Technical Sciences - Novi Sad	Automatic Control and System Engineering
Magister thesis	2004	Faculty of Technical Sciences - Novi Sad	Automatic Control and System Engineering
Bachelor's thesis	2000	Faculty of Technical Sciences - Novi Sad	Automatic Control and System Engineering

List of courses being held by the teacher in the accredited study programmes

	ID	Course name	Study programme name, study type
1.	E126	System Control, Modeling and Simulation	(E10) Power, Electronic and Telecommunication Engineering, Undergraduate Academic Studies
2.	E232	System Modeling and Simulation	(E20) Computing and Control Engineering, Undergraduate Academic Studies (ES0) Power Software Engineering, Undergraduate Academic Studies (M40) Technical Mechanics and Technical Design, Undergraduate Academic Studies (MR0) Measurement and Control Engineering, Undergraduate Academic Studies (SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies (SEL) Software Engineering and Information Technologies - Loznica, Undergraduate Academic Studies
3.	GI303A	Distributed Systems in Geomatics	(GI0) Geodesy and Geomatics, Undergraduate Academic Studies
4.	H213	System Modelling and Simulation 1	(GI0) Geodesy and Geomatics, Undergraduate Academic Studies (H00) Mechatronics, Undergraduate Academic Studies
5.	E2312	Software design for SCADA systems	(E20) Computing and Control Engineering, Undergraduate Academic Studies (SEL) Software Engineering and Information Technologies - Loznica, Undergraduate Academic Studies
6.	ESI004	Cloud Computing in power systems	(ES0) Power Software Engineering, Undergraduate Academic Studies
7.	ESI008	Development of Cloud application in power systems	(ES0) Power Software Engineering, Undergraduate Academic Studies
8.	SEAU02	SCADA Software	(SE0) Software Engineering and Information Technologies, Undergraduate Academic Studies
9.	AU502	Distributed Control Systems	(E20) Computing and Control Engineering, Master Academic Studies (MR0) Measurement and Control Engineering, Master Academic Studies (E10) Power, Electronic and Telecommunication Engineering, Master Academic Studies
10.	H301	System Modeling and Symulation	(H00) Mechatronics, Master Academic Studies
11.	E2533	Discrete event simulation	(E20) Computing and Control Engineering, Master Academic Studies
12.	E2535	Software Algorithms in Supervisory Control and Data Acquisition Systems	(E20) Computing and Control Engineering, Master Academic Studies (E10) Power, Electronic and Telecommunication Engineering, Master Academic Studies
13.	ESI027	Advanced cloud computing in power systems	(ES0) Power Software Engineering, Master Academic Studies



Study Programme Accreditation

MASTER ACADEMIC STUDIES

Power Software Engineering

List of courses being held by the teacher in the accredited study programmes

ID	Course name	Study programme name, study type
14. ESI032	Smart grid applications in Cloud	(ESO) Power Software Engineering, Master Academic Studies
15. ESI038	Service oriented architectures in Smart Grid	(ESO) Power Software Engineering, Master Academic Studies
16. DAU006	Selected Chapters in Modeling and Simulation of Dynamic Systems	(E20) Computing and Control Engineering, Doctoral Academic Studies
17. DAU018	Selected Chapters in Distributed Control Systems	(E20) Computing and Control Engineering, Doctoral Academic Studies
18. ZRD25A	Selected chapters from Artificial Ingeligence	(Z01) Safety at Work, Doctoral Academic Studies

Representative references (minimum 5, not more than 10)

1.	Kljajic, Miroslav; Gvozdenac, Dusan; Vukmirovic, Srdjan Use of Neural Networks for modeling and predicting boiler's operating performance ENERGY 2012 45 (1):304-311
2.	Vukmirović S., Erdeljan A., Čapko D., Lendak I., Nedić N.: Optimization of workflow scheduling in Utility Management System with hierarchical neural network, International Journal of Computational Intelligence Systems, 2011, Vol. 4, No 4, pp. 672-679, ISSN 1875-6883
3.	S.Vukmirovic, A. Erdeljan, D. Capko, I. Lendak, N. Nedic, Optimization of workflow scheduling in Utility Management System with hierarchical neural network, International Journal of Computational Intelligence Systems, ISBN 1875-6891, pp. 672 - 679
4.	S.Vukmirovic, A. Erdeljan, D. Capko, I. Lendak, Extension of the Common Information Model with Virtual Meter, Electronics and electrical engineering ISSN: 1392-1215, pp. 59 - 64
5.	D. Capko, A. Erdeljan, S.Vukmirovic, I. Lendak, A HYBRID GENETIC ALGORITHM FOR PARTITIONING OF DATA MODEL IN DISTRIBUTION MANAGEMENT SYSTEMS, Information technology and control ISSN: 1392-124X, pp. 316 - 322
6.	S.Vukmirovic, A. Erdeljan, D. Capko, I. Lendak, N. Nedic, A Genetic Algorithm Approach for Utility Management System Workflow Scheduling, Information technology and control ISSN: 1392-124X, pp. 310 - 316
7.	Ilić S., Vukmirović S., Erdeljan A., Kulić F.: Hybrid Artificial Neural Network System for Short-Term Load Forecasting, Thermal Science, 2012, Vol. 16, No S, pp. 215-224, ISSN 0354-9836
8.	Vukmirović S., Erdeljan A., Lendak I., Čapko D.: A novel software architecture for Smart Metering systems, Journal of Scientific and Industrial Research (JSIR), 2010, Vol. 2010, No 12, pp. 937-941, ISSN 0022-4456
9.	Vukmirović S., Vujić G., Vujić B., Jovičić N., Jovičić G., Babić M.: Experimental and Artificial Neural Network approach for forecasting of traffic air pollution in urban areas: the case study of Subotica, Thermal Science - International Scientific Journal, 2010, Vol. 14, pp. 79-87, ISSN 0354-9836
10.	Vukmirović G., Vukmirović S., Vujić G., Stanisavljević N., Ubavin D., Batinić B.: Using ANN model to determine future waste characteristics in order to achieve specific waste management targets -case study of Serbia, Journal of Scientific and Industrial Research (JSIR), 2011, Vol. 70, No 07, pp. 513-518, ISSN 0022-4456

Summary data for teacher's scientific or art and professional activity:

Quotation total :	0		
Total of SCI(SSCI) list papers :	12		
Current projects :	Domestic :	2	International : 0

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	Study Programme Accreditation MASTER ACADEMIC STUDIES Power Software Engineering	

Science, arts and professional qualifications

Name and last name:	Živanov S. Žarko		
Academic title:	Assistant Professor		
Name of the institution where the teacher works full time and starting date:	Faculty of Technical Sciences - Novi Sad 01.01.2001		
Scientific or art field:	Applied Computer Science and Informatics		
Academic career	Year	Institution	Field
Academic title election:	2012		Applied Computer Science and Informatics
PhD thesis	2012	Faculty of Technical Sciences - Novi Sad	Applied Computer Science and Informatics
Magister thesis	2007	Faculty of Technical Sciences - Novi Sad	Applied Computer Science and Informatics
Bachelor's thesis	2000	Faculty of Technical Sciences - Novi Sad	Applied Computer Science and Informatics

List of courses being held by the teacher in the accredited study programmes

	ID	Course name	Study programme name, study type
1.	E217	Computer Architecture	(E20) Computing and Control Engineering, Undergraduate Academic Studies (ES0) Power Software Engineering, Undergraduate Academic Studies
2.	E223A	Object Programming	(E20) Computing and Control Engineering, Undergraduate Academic Studies (ES0) Power Software Engineering, Undergraduate Academic Studies
3.	E225	Operating Systems	(E20) Computing and Control Engineering, Undergraduate Academic Studies (ES0) Power Software Engineering, Undergraduate Academic Studies
4.	E234	Compilers	(E20) Computing and Control Engineering, Undergraduate Academic Studies (ES0) Power Software Engineering, Undergraduate Academic Studies (MR0) Measurement and Control Engineering, Undergraduate Academic Studies
5.	SZP01	Selected topics in Information technologies	(E00) Power, Electronic and Telecommunication Engineering, Specialised Professional Studies
6.	E2529	Parallel and distributed architectures	(E20) Computing and Control Engineering, Master Academic Studies (ES0) Power Software Engineering, Master Academic Studies (MR0) Measurement and Control Engineering, Master Academic Studies (E10) Power, Electronic and Telecommunication Engineering, Master Academic Studies
7.	E2534	Data Compression	(E20) Computing and Control Engineering, Master Academic Studies (SE0) Software Engineering and Information Technologies, Master Academic Studies

Representative references (minimum 5, not more than 10)

1.	Žarko Živanov, Ivan Nejgebauer, Lazar Stričević, Miroslav Hajduković: Praktikum računarskih vežbi za predmet ARhitektura računara
2.	Rakić P., Milašinović D., Živanov Ž., Suvajdžin Z., Nikolić M., Hajduković M.: MPI-CUDA parallelization of a finite-strip program for geometric nonlinear analysis: A hybrid approach, <i>Advances in Engineering Software</i> , 2011, Vol. 42, No 5, pp. 273-285, ISSN 0965-9978
3.	Hajduković M., Milašinović D., Nikolić M., Rakić P., Živanov Ž., Stričević L.: Scope of MPI/OpenMP/CUDA Parallelization of Harmonic Coupled Finite Strip Method Applied on Large Displacement Stability Analysis of Prismatic Shell Structures, <i>Computer Science and Information Systems (ComSIS)</i> , 2012, Vol. 9, No 2, pp. 741-761, ISSN 1820-0214
4.	Živanov Ž., Rakić P., Hajduković M.: COLIBROS: Educational operating system, <i>Computer Science and Information Systems (ComSIS)</i> , 2010, Vol. 7, No 4, pp. 705-719, ISSN 1820-0214, UDK: 004.45
5.	Živanov Ž., Rakić P., Hajduković M.: Wireless sensor network application programming and simulation system, <i>Computer Science and Information Systems (ComSIS)</i> , 2008, Vol. 5, No 1, pp. 109-126, ISSN 1820-0214



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**Study Programme Accreditation**

MASTER ACADEMIC STUDIES

Power Software Engineering

Representative references (minimum 5, not more than 10)

6.	Živanov Ž., Rakić P., Hajduković M.: Using code generation approach in developing kiosk applications, Computer Science and Information Systems (ComSIS), 2008, Vol. 5, No 1, pp. 41-59, ISSN 1820-0214
7.	*****Autori: Suvajdžin Z., Hajduković M., Živanov Ž. Naziv: Character oriented program editing – habit or necessity? Naziv časopisa: Novi Sad Journal of mathematics
8.	*****Autori: Hajduković M., Suvajdžin Z., Živanov Ž., Hodžić E. Naziv: A problem of program execution time measurement Naziv časopisa: Novi Sad Journal of mathematics
9.	*****Milašinović D., Živanov Ž., Rakić P., Suvajdžin Z., Nikolić M., Hajduković M., Borković A., Milaković I.: A Finite-Strip Analysis of Nonlinear Shear-Lag Effect Supported by Automatic Visualization.
10.	Rakić P., Milašinović D., Živanov Ž., Hajduković M.: MPI-CUDA Parallelisation of the Finite Strip Method for Geometrically Nonlinear Analysis, 1. Internationale Conference on Parallel, Distributed and Grid Computing for Engineering, Pecs: Civil-Comp Press, , ISBN 978-1-905088-29-4

Summary data for teacher's scientific or art and professional activity:

Quotation total :	0			
Total of SCI(SSCI) list papers :	7			
Current projects :	Domestic :	0	International :	0

**Study Programme Accreditation**

MASTER ACADEMIC STUDIES

Power Software Engineering

Standard 10. Organizational and Material Resources

For realization of the study program of Power Software Engineering at the Faculty of Technical Sciences in Novi Sad, adequate human, spatial, technical and technological, laboratory, library and other resources are provided. They are all in accordance with the nature and requirements of the study program and predicted number of students. The teaching of the study program of Power Software Engineering is performed in 2 shifts so that more than 2m² per student are provided.

The teaching takes place in amphitheatres, classrooms, computer and specialized laboratories. The library has more than 300 library units relevant for realization of the study program of Power Software Engineering. For all the subjects of the study program of Power Software Engineering, appropriate textbook literature, devices and supplementary equipment are available on time and in a sufficient number for normal performance of the teaching process. The adequate information technology support is also available for performing of the study program.

The Faculty of Technical Sciences in Novi Sad has a library and reading room and provides every student with a seat in the amphitheater, classroom and laboratory, thus meeting the requirements of all teaching activities.

Table 10.1 List of rooms with their surface in higher education institution where the teaching of the study program takes place.



Study Programme Accreditation

MASTER ACADEMIC STUDIES

Power Software Engineering

Standard 11. Quality Control

The quality of the study program of Power Software Engineering of Master Academic Studies as well as all the other study programs of the Faculty of Technical Sciences in Novi Sad is provided by the functioning of the Quality Management System which was established at the Faculty in 2000, in accordance with the international standard ISO 9001 and certified by Federal Administration for Standardization as authorized domestic institution within TUV Nord as recognized authorized international institution for quality management system certification. The effectiveness and efficiency of the Quality Management System is confirmed by annual supervisory checks and by four re-certifications by the mentioned institutions.

Within the Quality Management System, the quality guarantee and quality control of the study program are supported by appropriate codes of conduct of all participants in the teaching process – procedures for creation of teaching programs, for enrolment of students, for realization of teaching process, for evaluation of students, for writing of the final – Master paper, for functioning of the Student Services, for Library Work, for evaluation of the success of the studies, for evaluation of the quality of teaching process by students and other procedures relating to resources and logistics of teaching process.

As a part of the Quality Management System, the practice of evaluation of users' and employees' satisfaction has been established: conducting opinion polls to students during the studies, at the end of teaching process in every subject where the students evaluate the quality of the program, realization of teaching process, literature and lecturer of the subject; conducting opinion polls to students upon the verification of enrolment in the following scholar year when they evaluate the quality of the study program and logistic support during the studies; conducting opinion polls to students at the end of studies, at the ceremony of handing out the diplomas when they evaluate the quality of the study program and logistic support during the studies. Other than that, the comfort of studying is evaluated (hygiene in the classrooms etc.); conducting opinion polls to teaching and non-teaching staff, when the work of Dean's Office, Student Service, Library and other services of the Faculty are evaluated as well.

For conducting the quality control of the study program, a special Committee has been formed, consisting of the manager of the study program, heads of all chairs participating in the realization of the study program, managers of all modules in the study program and a student in every year of study.

Self-evaluation of the study program is done within self-evaluation of the Faculty of Technical Sciences in Novi Sad as an institution and a corresponding "Report on self-evaluation of the institution" incorporates all the elements of quality of the study program, including the participation of students in self-evaluation and quality evaluation.



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Study Programme Accreditation

MASTER ACADEMIC STUDIES

Power Software Engineering

Standard 12. Distance Education

Distance learning is not provided for within the study program of Power Software Engineering and in accordance with the relevant standards, the accreditation does not apply to it.