

STRUCTURE OF THE STUDIES BY SEMESTERS AND REGULATIONS FOR COURSES SELECTION

Courses selection on PhD studies

Student is obliged to, in accordance to Article 15 of the Regulations for PhD studies, takes 5 courses, as follows:

- **Obligatory course regarding the history and development of idea in electrical engineering**
- **One course in domain of the fundamental disciplines**
- **Two courses in the research field significant for PhD thesis**
- **One of the courses from the graduate level that is not in the field of PhD thesis (selected from the list of courses of some other study program of graduate or PhD level).**

Each course is worth 8 ECTS credits.

Courses the students can select from graduate studies, and which are worth less than 8 ECTS credits, have an obligatory seminar worth additional number of credits necessitated to reach 8 ECTS.

Organization of the studying and research activities by semesters

I semester

Course title/Activities	Professor	Lect.+Exer.+Lab.+Proj.	ECTS
History of ideas and theories in electrical engineering	Prof. Dr Ilija Vujošević	3+1	8
Elective course in domain of the fundamental disciplines		3+1	8
Elective course in the field of research		3+1+seminar	8
Starting research on PhD thesis			6
Total			30

II semester

Course title/activities	Lect.+Exer.+Lab.+Proj.	ECTS
Elective course in the field of research	3+1+seminar	8
Elective course that is not in the field of research	3+1+seminar	8
Starting research on PhD thesis		14
Total		30

III Semester

Activitise title	ECTS
Researches as a part of PhD dissertation	30

IV Semester

Activitise title	ECTS
Researches as a part of PhD dissertation	30

V Semester

Activitise title	ECTS
Researches as a part of PhD dissertation	30

VI Semester

Activitise title	ECTS
Preparation and PHD dissertation defence	30

Lists of fundamental disciplines, disciplines in the research field and disciplines that are not in the research field are given in sequel.

Note: Allocation of the ECTS credits completely follows the limits established by Article 5 of the Regulations for PhD studies at the University of Montenegro

CURRICULUM

OBLIGATORY COURSE AND FUNDAMENTAL DISCIPLINES

Curriculum of PhD studies

Obligatory course

Course title	Professor	Lect.+ Exer.	ECTS
History of ideas and theories in electrical engineering	Prof. Dr Ilija Vujošević	3+1	8

Fundamental disciplines (Student chooses one from the list below)

Course title	Professor	Lect.+ Exer.	ECTS
Theory of stochastic processes	Prof. Dr Ljubiša Stanković	3+1	8
Selected topics from modern physics	Doc. Dr Mara Šćepanović	3+1	8
Plasma application in quantum electronics – lasers	Doc. Dr Mara Šćepanović	3+1	8
Physics of materials	Prof. Dr Predrag Miranović	3+1	8
Nanotechnologies	Doc. Dr Nikša Tadić	3+1	8
Numerical methods in electrical engineering	Prof. Dr Dragan Filipović	3+1	8
Application of special functions in electrical engineering	Prof. Dr Dragan Filipović	3+1	8
Theory of approximation and optimizations in electrical engineering	Prof. Dr Dragan Filipović	3+1	8
Neural networks	Prof. Dr Đorđije Jovanović	3+1	8
Fuzzy logic	Doc. Dr Budimir Lutovac	3+1	8
Theory of graphs	Doc. Dr Budimir Lutovac	3+1	8
Genetic algorithms	Prof. Dr Igor Đurović	3+1	8
Theory of detection and estimation	Doc. Dr Miloš Daković	3+1	8
Matrix transformations in electro energetic	Prof. Dr Gojko Joksimović	3+1	8

COURSES BY RESEARCH FIELDS

Electronics as a research field

Courses from PhD studies

Course title	Professor	Lect.+ Exer.	ECTS
Designing of microelectronic systems (advanced course)	Z. Mijanović	3+1	8
Multimedia systems (advanced course)	S. Stanković	3+1	8
Nonlinear systems and theory of special trans functions	S. Perović	3+1	8
Power electronics (advanced course)	Đ. Jovanović	3+1	8
Biomedical measurements and instrumentations	R. Stojanović	3+1	8

Courses from graduate studies, which can be chosen if the student has not taken them earlier.

Course title	Professor	Lect.+Exer.+Lab.	ECTS + sem
Designing of VLSI circuits	N. Tadić	3+1+0.5	6+2
Physical-technical measurements	R. Dragović-Ivanović	3+1+1	7+1
Computer peripherals and interfaces	Z. Mijanović	3+1	6+2
Multimedia systems	S. Stanković	3+1	6+2
Simulations of electronic circuits	R. Stojanović	2+ 0+2	5+3
Designing of microcontrolling systems	Z. Mijanović	2+0+2	5+3
Electronic measuring instruments	N. Tadić	3+1+0.5	5+3
Industrial electronics	R. Stojanović	2+0+2	5+3
Designing of analog integrated circuits	N. Tadić	3+1	5+3
Sensors	R. Dragović-Ivanović	3+1	5+3
Real time control	M. Đurović	3+1	5+3
Selected topics from digital systems	S. Stanković	3+1	5+3
Computer peripherals and interfaces (advanced course)	Z. Mijanović	3+1	5+3
Integrated microsystems	N. Tadić	3+1	5+3
Computer and machine vision	R. Stojanović	3+1	5+3
Hardware – software design of electronics circuits and system	R. Stojanović	3+1	5+3

Number of ECTS credits is supplemented up to 8 by an obligatory seminar which needs to have a research character

Computer science as a research field

Courses from PhD studies

Course title	Professor	Lect.+ Exer.	ECTS
Multiprocessor and distributed computer systems	J. Poliščuk	3+1	8
Theory of the algorithms	I. Đurović	3+1	8
Digital image processing (advanced course)	I. Đurović	3+1	8
Design of microcomputer systems	V. Ivanović	3+1	8
Data basis	J. Poliščuk	3+1	8
Parallel programming	M. Daković	3+1	8

Courses from graduate studies, which can be chosen if the student has not taken them earlier.

Course title	Professor	Lect.+ Exer.+Lab.	ECTS + sem
Organization and computer architecture II	V. Ivanović	3+1	6+2
Data basis	J. Poliščuk	3+1+1	6+2
Digital image processing	I. Djurović	3+1	6+2
Multimedia systems	S. Stanković	3+1	6+2
Adaptive discrete systems and neural networks	LJ. Stanković (M. Daković)	3+1	6+2
Information systems	J. Poliščuk	3+1	5+3
Computer networks	I. Radusinović	3+1	5+3
Expert systems	J. Poliščuk	3+1	5+3
Operative systems (advanced course)	B. Krstajić	3+1	5+3
Digital signal processing (advanced course)	LJ. Stanković (M. Daković)	3+1	5+3
Design of information systems	J. Poliščuk	3+1	5+3
Programming languages (advanced course)	I. Đurović	3+1	5+3
Internet technologies	B. Krstajić	3+1	5+3
Automatic design of microelectronic circuits and systems	R. Stojanović	3+1	5+3
Theory of stochastic processes	LJ. Stanković	3+1	5+3

Number of ECTS credits is supplemented up to 8 by an obligatory seminar which needs to have a research character

Telecommunications as a research field

Courses from PhD studies

Course title	Professor	Lect.+ Exer.	ECTS
Personal telecommunication systems	M. Pejanović Đurišić	3+1	8
Theory of stochastic processes	Lj. Stanković	3+1	8
Telecommunication networks (advanced course)	I. Radusinović	3+1	8
Computer networks (advanced course)	I. Radusinović	3+1	8
Protocols and technologies for wireless communication systems	M. Pejanović Đurišić	3+1	8
Architecture of packets commutators	I. Radusinović	3+1	8
Theory of information and codes (advanced course)	I. Đurović	3+1	8
Simulation and software radio	Z. Veljović	3+1	8
Digital signal processing (advanced course)	Lj. Stanković	3+1	8

Courses from graduate studies, which can be chosen if the student has not taken them earlier.

Course title	Professor	Lect.+ Exer.+Lab.	ECTS + sem
Radiotechnique	I. Kostić	3+ 0+1	6+2
Optical communications	Z. Veljović	3+0+1	6+2
Radiocommunications	I. Kostić	3+0+1	6+2
Telecommunication networks	I. Radusinović	3+1	6+2
Commutation systems	I. Radusinović	3+1	6+2
Digital telecommunication systems	Z. Veljović	3+1+1	5+3
Mobile radio communications	Z. Veljović	3+1	5+3
Computer networks	I. Radusinović	3+1	5+3
Microwave techniques	D. Filipović	3+1	5+3
RF electronics	I. Kostić	3+1	5+3
Principles of modern telecommunications	I. Radusinović	3+1	5+3
Theory of digital modulations	I. Kostić	3+1	5+3
Digital radio systems	I. Kostić	3+1	5+3
Satellite communications	Z. Veljović	3+1	5+3
General theory of telecommunication networks	I. Radusinović	3+1	5+3
Multiple access techniques	Z. Veljović	3+1	5+3

Number of ECTS credits is supplemented up to 8 by an obligatory seminar which needs to have a research character

Automatic as a research field

Courses from PhD studies

Course title	Professor	Lect.+ Exer.	ECTS
Process controlling (advanced course)	M. Radulović	3+1	8
Power electronics (advanced course)	Dj. Jovanović	3+1	8

Courses from graduate studies, which can be chosen if the student has not taken them earlier.

Course title	Professor	Lect.+ Exer.+Lab.	ECTS + sem
Technological process controlling	M. Radulović	3+ 0+1	5+3
Modeling and simulation of dynamic systems	B. Krstajić	2+0+1	4.5+3.5
Robotic and flexible producing systems	N. Jauković	2+0+1	4.5+3.5
Designing of power semiconductor converters	V. Vujičić	3+1	5.5+2.5
Optimal controlling	Z. Uskoković	3+1	4.5+3.5
Electrical drives	Đ. Jovanović	3+2+1	6+2
Controlling and regulations of electrical drives	Đ. Jovanović	3+1	5+3
Microprocessors in industry	M. Ostojić	3+1	5+3
Adaptive controlling systems	B. Krstajić	3+1	5+3
Mechatronic	V. Vujičić	3+1	5+3
Real time controlling	M. Đurović	3+1	5+3
Artificial intelligence	N. Jauković	3+1	5+3
Modern trends in automatic	N. Jauković	3+1	5+3
Digital signal processing (advanced course)	Lj. Stanković	3+1	5+3
Electrothermics	M. Radulović	3+1	5+3
Controlling EMP of direct current	Dj. Jovanović	3+1	5+3
Controlling EMP of alternating current	Dj. Jovanović	3+1	5+3

Number of ECTS credits is supplemented up to 8 by an obligatory seminar which needs to have a research character

Industry electronics as a research field

Courses from PhD studies

Course title	Professor	Lect.+ Exer.	ECTS
Process controlling (advanced course)	M. Radulović	3+1	8
Distributed controlling systems (advanced course)	B. Krstajić	3+1	8
Power electronics (advanced course)	Dj. Jovanović	3+1	8

Courses from graduate studies, which can be chosen if the student has not taken them earlier.

Course title	Professor	Lect.+ Exer.+Lab.	ECTS + sem
Modeling and dynamic of electrical machines	M. Ostojić	2+1+1	5+3
Electrical drives	Đ. Jovanović	3+2+1	6+2
Technological process controlling	M. Radulović	3+0+1	5+3
Optimal controlling	Z. Uskoković	3+1	5+3
Testing of electrical machines	R. Laković	3+0+2	5+3
Special electrical machines	M. Ostojić	3+0+1	5+3
Microprocessors in industry	M. Ostojić	3+1	5+3
Real time controlling	M. Đurović	3+1	5+3
Mechatronic	V. Vujičić	3+1	5+3
Experiment planning	R. Laković	3+0+1	5+3
Regulation of electrical machines	M. Ostojić	2+1+1	5+3
Microprocessor control of engine	M. Ostojić	3+0+1	5+3
Digital signal processing (advanced course)	Lj. Stanković	3+1	5+3
Electrothermic	M. Radulović	3+1	5+3
Controlling EMP of direct current	Dj. Jovanović	3+1	5+3
Controlling EMP of alternating current	Dj. Jovanović	3+1	5+3

Number of ECTS credits is supplemented up to 8 by an obligatory seminar which needs to have a research character

Electroenergetic systems as a research field

Courses from PhD studies

Course title	Professor	Lect.+ Exer.	ECTS
EDS optimization	J. Radović	3+1	8
General energetics	S. Škuletić	3+1	8
Selected topics from EES stability	I. Vujošević	3+1	8

Courses from graduate studies, which can be chosen if the student has not taken them earlier.

Course title	Professor	Lect.+ Exer.+Lab.	ECTS + sem
EES analysis II	I. Vujošević	2+2+0.5	6+2
High voltage technique	S. Škuletić	3+1+1	6+2
Electro distributive systems	J. Radović	3+1	5+3
Electrical drives	Đ. Jovanović	2+1+0.5	5+3
EES exploiting and planning	I. Vujošević	3+0	4.5+3.5
Designing by computer in EES	J. Radović	1+0+3	3.5+4.5
Controlling EES	I. Vujošević	3+1	5+3
Relay protection	I. Vujošević	3+0+2	5+3
Power transmission lines	J. Radović	3+1	5+3
EES reliability	S. Škuletić	3+1	5+3
Telecommunications in electro energetics	I. Kostić	3+1	5+3
Quality of electrical energy	J. Radović	3+1	5+3
Over-voltage and coordination of isolation	S. Škuletić	3+1	5+3
Designing of EE power lines	J. Radović	3+1	5+3
Optimization of EES drives	I. Vujošević	3+1	5+3
Alternative electrical energy sources	S. Škuletić	3+1	5+3
Regulations of excitation of synchronous machines	M. Ostojić	3+1	5+3

Number of ECTS credits is supplemented up to 8 by an obligatory seminar which needs to have a research character

Microwave techniques as a research field

Courses from PhD studies

Course title	Professor	Lect.+ Exer.	ECTS
Software tools for Designing in MWT	D. Filipović	3+1	8

Courses form graduate studies which can be chosen if the student has not passed them earlier.

Course title	Professor	Lect.+ Exer.+Lab.+Proj.	ECTS + sem
Radiation and propagation of electromagnetic waves	S. Jovičević (A. Jovanović)	3+1+0.5	6+2
Radio techniques	I. Kostić	3+0+1	6+2
Microwave techniques	D. Filipović	3+1+0.5	6+2
Nonlinear circuits	B. Lutovac (V. Rubežić)	3+1	6+2
Digital filters	B. Lutovac	3+ 1	6+2
Microwave measurements	D. Filipović	2+0+1	5+3
Microwave circuits	D. Filipović	3+1	5+3
Microwave antennas	S. Jovičević (A. Jovanović)	2+1	5+3
Optical communications	Z. Veljović	3+1	5+3
Digital telecommunication systems	Zoran Veljović	3+1+1	5+3
Numerical methods	G. Joksimović	3+1	5+3
Mobile radio communications	M. Pejanović Đurišić	3+1	5+3
Electromagnetic compatibility	D. Filipović	3+1	5+3
Microwave electronics	D. Filipović	3+1	5+3
Syntheses of electrical circuits	B. Lutovac	3+1	5+3
Digital radio systems	I. Kostić	3+1	5+3

Number of ECTS credits is supplemented up to 8 by an obligatory seminar which needs to have a research character