SPECIALITY **ELECTRONICS**
EDUCATIONAL DEGREE **BACHELOR**
PROFESSIONAL QUALIFICATION **ELECTRONICS ENGINEER**

DEGREE COURSE OF ELECTRONICS

First academic year			
First semester	ECTS credits	Second semester	ECTS credits
Mathematics For Engineers I	6	Mathematics for Engineers II	6
Foreign Language I	3	Physics for engineers II	6
Programing I	6	Electrical engineering	6
Engineering graphics	5	Foreign Language II	3
Physics for engineers I	5	Constructing elements in electronics	4
Electrotechnical materials	5	Electrical measurements	5
Sport	0	Sport	0
	Total: 30		Total: 30

Second academic year			
First semester	ECTS credits	Second semester	ECTS credits
Data transfer and computer communications	6	Digital electronic	6
Mathematics for Engineers III	5	Power conversion techniques and power supplies	6
Analogue electronic	6	Theory of automatic control	6
Computer design I	4	Electrical Measurements	6
Technological Practice I	3	Programing II (visual studio, dot net)	6
Signals and systems	6		
	Total: 30		Total: 30

Third academic year			
First semester	ECTS credits	Second semester	ECTS credits
Elective of the first group	2	Programing logical controllers	7
Foreign Language III	4	*Elective of the third group*	2
Design and reliability of electronics equipment	6	Sensors and sensor networks	6
Telecommunication techniques	6	Computer design II	5
Elective of the second group	6	*Technological Practice II*	4
Electronic devices for command and control	6	Mikrotsesorna technique	6
Elective choice *Project in digital electronic* *Project in power conversion techniques* *Web design* *Applications for mobile operation systems*		***Elective choice*** *Project design of electronic equipment* *Project in reliability of electronic equipment*	
	Total: 30		Total: 30

Fourth academic year			
First semester	ECTS credits	Second semester	ECTS credits
Automation of electronic manufacturing	6	*Elective of the fifth group*	5
Technological Practice III	6	*Production practice*	6
Security systems and monitoring	6	*Elective of the six group*	4
Elective of the fourth group	6	Computerized devices and systems work in real time	5
Fundamentals of nanotechnology	6	*Diploma Thesis*	10
Elective choice		***Elective choice***	
Computer simulation with Matlab		*Automotive electronics*	
Computer analysis of engineering problems		*Computer based automotive diagnostic systems*	
		Renewable energy sources and systems	
		Electronic control devices for alternative energy sources	
	Total: 30		Total: 30

TOTAL: 240 CREDITS FOR FOUR ACADEMIC YEARS

ANNOTATION OF COURSES

FOREIGN LANGUAGE - I

ECTS credits: 3	**Semester:** I
Evaluation: Written exam	**Hours per week:** 0 lectures+3 seminar exercises +0 laboratory exercises
Course type: Seminar exercises	**Course status:** Compulsory
	Degree course: Electronics

Lecturer: Assist. Prof. Bilyana Georgieva, PhD – bilianag@yahoo.com, bilianag@swu.bg

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Annotation: The aim of the course „Foreign language - English" is to ensure the development of communication skills, reaching of certain phonetic, grammatical, lexical and thematic minimum, skills and habits for participation in real, communicative situations, knowledge and individual work with vocabulary. It aims to review and systematize the basic knowledge of the undergraduates and provides equal start level for the next stage of education, called "language of the programme". The choice of topics is based on their high particularly in the scientific style of speech and their unconditional structural significance and necessity of learning a foreign language. Widely used communicative exercises focus that strengthen the necessary grammatical habits and encourage students to be active speech activity in the studied subjects. The practical course is based on the thematic texts reflecting everyday student life, elementary special technical terminology on the subject and aims to stimulate the desire and motivation of students to enhance their language and consistent level – Elementary and Pre-intermediate.

Purpose of the course: The aim of the course is to build an initial communicative competence, as the ability to understand and draw meaningful oral and written statements, in accordance with the rules of the English language to develop reading skills and comprehension of texts from everyday communication and presentation and related texts the basic terms in the specialty; develop skills in technical vocabulary can make translations of technical texts from English into Bulgarian language using a dictionary.

Educational Methods: Active methods are used through different exercises; based tests are made for control of the learned, translation of technical literature.

PROGRAMING – I

ECTS credits: 6	Semester: I
Evaluation: Ongoing assessment	Hours per week: 2 lectures + 0 seminar exercises + 2 laboratory exercises
Course type: Lectures and laboratory exercises	Course status: Compulsory
	Degree course: Electronics

Lecturer: Assoc. Prof. Ivan Trenchev, PhD – trenchev@swu.bg
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Assistant: **Assistant Ivan Todorin** – ivan_todorin@swu.bg
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Annotation: This subject is aimed at students with little or no programming experience. It aims to provide students with an understanding of the role computation can play in solving problems. It also aims to help students, regardless of their major, to feel justifiably confident of their ability to write small programs that allow them to accomplish useful goals. The class will use the Python programming language.

Purpose of the course: This course has been designed for independent study. It provides everything you will need to understand the concepts covered in the course.

Educational Methods: Lectures and seminars.

ENGINEERING GRAPHICS

ECTS credits: 5	Semester: I
Evaluation: Ongoing assessment	Hours per week: 2 lectures + 0 seminar exercises + 3 laboratory exercises
Course type: Lectures and laboratory exercises	Course status: Compulsory
	Degree course: Electronics

Lecturer: Assoc. Prof., Eng. Stoycho Stefanov, PhD – ststephanoff@swu.bg
Department: Mechanical Engineering and Technologies – technical_mtt@swu.bg
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Assistant: assist. prof. eng. Evdokia Petkova – e.p.petkova@swu.bg
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Annotation: Course "Engineering Graphics" is designed to introduce students to the methods of image creation and standards related to engineering graphics. The course is related to training on technical drawing, mathematics and informatics in primary and secondary school. Students need to master the necessary knowledge and to develop skills and competencies to implement and reading graphic images of geometric and technical objects.

Purpose of the course: Students should learn the theoretical material, to acquire skills and competences count and prepare sketches, drawings and other design documents to use them in the study of technical disciplines subsequent semesters and in pursuance of their future profession.

Educational Methods: Lectures and practical exercises.

PHYSICS FOR ENGINEERS – I

ECTS credits: 5	Semester: I
Evaluation: Written exam	Hours per week: 2 lectures + 0 seminar exercises + 1 laboratory exercises
Course type: Lectures and laboratory exercises	Course status: Compulsory
	Degree course: Electronics

Lecturer: Assoc. Prof. Dimitrina Kerina, PhD – d_kerina@swu.bg
   Department: Communication and Computer Engineering and Technologies – technical_kktt@swu.bg
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Assistant: Assoc. Prof., Eng. Raika Stoyanova, PhD – rajka@swu.bg
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Annotation: Main topics of the course are: Basic Concepts of Kinematics and Dynamics, Oscillations and Waves, Dynamics of the Fluids and Basic Concepts of Thermodynamics and Molecular-Kinetics Theory.

Purpose of the course: The course in Physics for Engineers – I aims to provide knowledge about objective fundamental natural laws, basic Physical methods of investigation and basic Physical concepts and relations.

Educational Methods: Lectures are prepared on Power point. The contemporary technical equipment as multimedia, software, models, etc. is used for these lectures. Lectures are visualized by demonstrations and laboratory tasks performance during the laboratory classes.

ELECTROTECHNICAL MATERIALS

ECTS credits: 5	Semester: I
Evaluation: Ongoing assessment	Hours per week: 2 lectures + 0 seminar exercises + 1 laboratory exercises
Course type: Lectures and laboratory exercises	Course status: Compulsory
	Degree course: Electronics

Lecturer: Assoc. Prof. Dimitrina Kerina, PhD – d_kerina@swu.bg
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Faculty: Faculty of Engineering – technical@swu.bg
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Assistant: assist. prof.Ivo Angelov - ivo.angelov@swu.bg
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Annotation: Main topics of the course are: Fundamentals of the material knowledge, Material's non-electrical properties, Dielectrics, Conductors, Semiconductors and Magnetics. Applications of the passive components resistors, capacitors and inductors are considered.

Purpose of the course: The course in Electrotechnical Materials aims to provide knowledge about behavior and processes that occur in different types of electrical materials - dielectrics, conductors, semiconductor and magnetic materials when they are placed in an electric, magnetic and thermal field as well as radiation.

Educational Methods: Lectures are prepared on Power point. The contemporary technical equipment as multimedia, software, models, etc. is used for these lectures. Lectures are visualized by demonstrations and laboratory tasks performance during the laboratory classes.

MATHEMATICS FOR ENGINEERS – II

ECTS credits: 6	Semester: II
Evaluation: Written exam	Hours per week: 2 lectures + 0 seminar exercises + 2 laboratory exercises
Course type: Lectures and laboratory exercises	Course status: Compulsory
	Degree course: Electronics

Lecturer: Prof. Oleg Mushkarov DSc - muskarov@math.bas.bg
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Assistant: Ass. Prof. Anka Markovska PhD – a_markovska@swu.bg
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Annotation: Main topics:
- Integral calculus of functions of one real variable - indefinite integral, basic integration techniques, definite integral - classes of integrable functions, properties of the definite integral
- Functional sequences and series
- Differential calculus of functions of several variables- partial derivatives of first and higher order, local and global extrema of functions of several variables
- Ordinary differential equations
- Integral calculus of functions of several variables- double and triple integrals and their calculation, change of variables, geometric and physical applications
- Path integrals - definition, properties, calculation, applications.

Purpose of the course: The course aims to provide mathematical foundations for further study of other general disciplines such as physics , electrical engineering , etc. and all special technical disciplines. This course sets also some educational objectives as the development of algorithmic thinking and capabilities for mathematical modelling of natural phenomena.

Teaching Methods: lectures and lab exercises

PHYSICS FOR ENGINEERS – II

ECTS credits: 6	Semester: II
Evaluation: Written exam	Hours per week: 2 lectures + 0 seminar exercises + 2 laboratory exercises
Course type: Lectures and laboratory exercises	Course status: Compulsory
	Degree course: Electronics

Lecturer: Assoc. Prof. Dimitrina Kerina, PhD – d_kerina@swu.bg
 Department: Communication and Computer Engineering and Technologies – technical_kktt@swu.bg
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 Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.
 Phone: +359-73-88 51 62

Annotation: Main topics of the course are: Electrostatics, Stationary Electromagnetic Field, Alternative Electromagnetic Field, Electromagnetic Phenomena in the Matter, Oscillations and Waves and Optics.

Purpose of the course: The course in Physics for Engineers – II aims to provide knowledge about fundamental natural laws, electromagnetic and optic phenomena and basic Physical methods for investigations.

Educational Methods: Lectures are prepared on Power point. The contemporary technical equipment as multimedia, software, models, etc. is used for these lectures. Lectures are visualized by demonstrations and laboratory tasks performance during the laboratory classes.

ELECTRICAL ENGINEERING

ECTS credits: 6	Semester: II
Evaluation: Written exam	Hours per week: 2 lectures + 1 seminar exercises + 1 laboratory exercises
Course type: Lectures, seminar exercises and laboratory exercises	Course status: Compulsory
	Degree course: Electronics

Lecturer: Assoc. Prof., Eng. Nikolay Atanasov, PhD – natanasov@swu.bg
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Annotation: The course presents the fundamental laws of circuit analysis and serves as the foundation for the study of electrical circuits. The course starts with the introduction of the basic laws of electrical circuit analysis: Kirchhoff's and Ohm's laws. DC and AC network analysis, equivalent transformations, etc.

Purpose of the course: The aim of the course is to introduce students to fundamental laws of circuit analysis, DC and AC network analysis, equivalent transformations, etc.

Educational Methods: Lectures, seminar and laboratory exercises.

FOREIGN LANGUAGE II

ECTS credits: 3	**Semester:** II
Evaluation: Written exam	**Hours per week:** 0 lectures + 2 seminar exercises + 0 laboratory exercises
Course type: Seminar exercises	**Course status:** Compulsory
	Degree course: Electronics

Lecturer: assist. prof. Bilyana Georgieva, PhD – bilianag@yahoo.com, bilianag@swu.bg

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Annotation: The aim of the course „Foreign language - English" is to ensure the development of communication skills, reaching of certain phonetic, grammatical, lexical and thematic minimum, skills and habits for participation in real, communicative situations, knowledge and individual work with vocabulary. It aims to review and systematize the basic knowledge of the undergraduates and provides equal start level for the next stage of education, called "language of the programme". The choice of topics is based on their high particularly in the scientific style of speech and their unconditional structural significance and necessity of learning a foreign language. Widely used communicative exercises focus that strengthen the necessary grammatical habits and encourage students to be active speech activity in the studied subjects. The practical course is based on the thematic texts reflecting everyday student life, elementary special technical terminology on the subject and aims to stimulate the desire and motivation of students to enhance their language and consistent level – Elementary and Pre-intermediate. Course aim: The aim of the course is to build an initial communicative competence, as the ability to understand and draw meaningful oral and written statements, in accordance with the rules of the English language to develop reading skills and comprehension of texts from everyday communication and presentation and related texts the basic terms in the specialty; develop skills in technical vocabulary can make translations of technical texts from English into Bulgarian language using a dictionary.

Education Methods: Active methods are used through different exercises; based tests are made for control of the learned, translation of technical literature.

CONSTRUCTING ELEMENTS IN ELECTRONICS

ECTS credits: 4	Semester: II
Evaluation: Ongoing assessment	Hours per week: 2 lectures + 0 seminar exercises + 1 laboratory exercises
Course type: Lectures and laboratory exercises	Course status: Compulsory
	Degree course: Electronics

Lecturer: Assoc. Prof., Eng. Valeri Vachkov, PhD – v.vatchkov@swu.bg
Department: Electrical Engineering, Electronics and Automatics – technical_eea@swu.bg
Faculty: Faculty of Engineering – technical@swu.bg
Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.
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Assistant: Assist. Prof., Eng. Ljubomir Markov – lmarkov@swu.bg

Annotation: The course is being taught using a video wall and multimedia. The necessary time for self study of the students is twice the number of the academic hours. The exercises are carried out in laboratory, equipped with specialized measurement devices. The exam is given to students, attending the laboratory practice, and it is in written form, consisting of two questions.

Purpose of the course: By means of the subject "Semiconductor elements" the students get acquainted with basic elements of the physics of semiconductors and PN transition, composition, way of work, characteristics, parameters and equivalent elements schemes of semiconductors in discrete and chips application. Some typical applications are studied. The subject is a basic introductory subject in the electronics science and is studied after the courses in mathematics, physics, and electrical physics. It has basic relations to the consequent specialized courses in electronics, computer science and metrics.

Educational Methods: The Course is taught in lecture halls together with the students from the major "Computer systems and technologies" in groups as usually the groups consist of 10 to 14 students. The students have individual independent tasks, make up presentations of the projected systems.

ELECTRICAL MEASUREMENTS

ECTS credits: 5	**Semester:** II
Evaluation: Written exam	**Hours per week:** 2 lectures + 0 seminar exercises + 1 laboratory exercises
Course type: Lectures and laboratory exercises	**Course status:** Compulsory
	Degree course: Electronics

Lecturer: Assoc. Prof. Doctor (PhD) Eng. Uliana Paskaleva – paskaleva_6@swu.bg, uli_6@abv.bg,

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Assistant: assistant Krasimir Damov – krasi_damov@abv.bg

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Annotation:

Aim of the course: To familiarize students with the basic theoretical questions of measurement methods and tools for measuring electrical values. Understanding the basic metrological characteristics of measurement systems to learn to use in the laboratory, basic instrumentation (for voltage, current, power, energy, phase difference, frequency, parameters of bipolar, etc.).

Educational Methods: Lecture, demonstration, power point presentations, conversation, discussion, conference, analysis of problems, laboratory measurements, laboratory tests. Use interactive methods of training and during lectures and laboratory exercises.

DATA TRANSFER AND COMPUTER COMMUNICATIONS

ECTS credits: 6	**Semester:** III
Evaluation: Written exam	**Hours per week:** 2 lectures + 0 seminar exercises + 2 laboratory exercises
Course type: Lectures and laboratory exercises	**Course status:** Compulsory
	Degree course: Electronics

Lecturer: prof. Svetla Radeva, DSc, PhD
Department: Communication and Computer Engineering – technical_kktt@swu.bg
Faculty: Faculty of Engineering – technical@swu.bg
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Annotation: The teaching course on Data Transfer and Computer Communications presents modern trends on development of this area of communications. The discipline aims to introduce to students methods and means of data transfer at computer and communication networks. The protocol architectures of TCP/IP and OSI model for data communication are under consideration, as well as basic characteristics and parameters of communication signals, communication channels and different transportation media. The topics, connected with linear coding and modulation of digital signals, uncover and correction of bit and dynamic errors at digital data transfer and communications, coding and manipulation of digital signals, protocols for automatic control of the channel layer and data transfer regimes are detailed considered.

Aim of the course: The purpose of the discipline is to introduce to the students modern trends in data and computer communications, parameters of the communication signals and communication channels, uncover and correction of bit and dynamic errors at digital data transfer and communications, coding and manipulation of digital signals, protocols for automatic control of the channel layer and data transfer regimes.

Educational Methods: The lectures are leading at lecture auditorium together with students from specialties Communication Technique and Technology, Electronics and Computer Systems and Technologies. The exercises are leading for laboratory group of 10 students.

MATHEMATICS FOR ENGINEERS – III

ECTS credits: 5	**Semester:** III
Evaluation: Written exam	**Hours per week:** 2 lectures + 0 seminar exercises + 2 laboratory exercises
Course type: Lectures and laboratory exercises	**Course status:** Compulsory
	Degree course: Electronics

Lecturer: assoc. Prof. Vassil Grozdanov, PhD - vassgrozdanov@yahoo.com
Department: „Mathemathics",
Faculty: Natural Sciences and Mathematics
Phone: (+359) 073 88 51 62

Assistant: Ass. Prof. Anka Markovska PhD – a_markovska@swu.bg
Department: Electrical Engineering, Electronics and Automatics – technical_eea@swu.bg
Faculty: Faculty of Engineering – technical@swu.bg
Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.
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Annotation: The course on „Engeneering mathematics – III part" considers problems, related with the differential and integral calculation of functions of several variables, ordinary differential equations, Fourier series, integral of Fourier, transformation of Fourirer. Also the problems of the operating calculation will be considered. The course gives knowledge of the students that eill be necessary for studying many technical disciplines.

Course Aims: The aim of the course of „Engeneering mathematics – **III part"** is that the students to receive knowledge to solve problems on the teaching material. Also the students must work with the system "MatLab".

Educational methods: Lectures, exercises, individual work with scientific literature, textbooks work, individual problem solving and presentations.

ANALOGUE ELECTRONIC

ECTS credits: 6	Semester: III
Evaluation: Written exam	Hours per week: 2 lectures + 0 seminar exercises + 2 laboratory exercises
Course type: Lectures and laboratory exercises	Course status: Compulsory
	Degree course: Electronics

Lecturer: Assoc. Prof., Eng. Vladimir Gebov, PhD – askon@swu.bg
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Assistant: Chief Assist. Prof., Eng. Filip Tsvetanov, PhD – ftsvetanov@swu.bg
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Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.
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Annotation: The training course includes basic issues related to analogue electronics sheets, parts and related connections between them.

Course Aims: Students to acquire the necessary minimum of theoretical and professional knowledge and skills for the implementation of the electronic analogue sheets and parts used in more popular provider in the world.

Educational methods: Lectures, individual work and scientific literature textbook exercises, brainstorming and discussion, work individually, solve problems, exercise, and Power Point presentation.

COMPUTER DESIGN – I

ECTS credits: 4	Semester: III
Evaluation: Written exam	Hours per week: 1 lectures + 0 seminar exercises + 2 laboratory exercises
Course type: Lectures and laboratory exercises	Course status: Compulsory
	Degree course: Electronics

Lecturer: Assoc. Prof., Eng. Stoycho Stefanov, PhD – ststephanoff@swu.bg
  Department: Mechanical Engineering and Technologies – technical_mtt@swu.bg
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Assistant: Assist. Prof., Eng. Emil Frenski – emil_f@swu.bg
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Annotation: Practical exercises resolving tasks for computer aided drawings of electrical circuits and devices PCB topology, as well as SPICE simulation.

Course Aims: The main aim of the course is to give knowledge and form practical skills in computer aided design and optimize different kinds of analogue and digital circuits.

Educational Methods: Lectures and practical exercises.

SIGNALS AND SYSTEMS

ECTS credits: 6	Semester: III
Evaluation: Written exam	Hours per week: 2 lectures + 0 seminar exercises + 2 laboratory exercises
Course type: Lectures and laboratory exercises	Course status: Compulsory
	Degree course: Electronics

Lecturer: Prof. Svetla Radeva, DSc, PhD
Department: Communication and Computer Engineering – technical_kktt@swu.bg
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Status of the discipline into the Teaching plan: Obligatory discipline at the Bachelor teaching plans of the specialties Communication Technique and Technology, Electronics and Computer Systems and Technologies

Annotation: The teaching course on Signals and Systems treat fundamental knowledge on continuous and discrete signals and systems at time and frequency area. The students receive knowledge on spectral analysis of periodic and non-periodic signals, kind of spectra and their basic characteristics. The topics, connected with signal modulation, methods of amplitude modulation and their influence on the width of frequency bandwidth and increasing of throughput of communication system, transformation of analog signals into digital, kind of digital filters, optimal linear filtration and noise stable coding of signals are detailed considered. This fundamental course on Signals and Systems gives to students the necessity amount of knowledge for their professional skills at followed specialized disciplines from the teaching plan of the specialty.

Course Aims: The teaching discipline devoted on Signals and Systems presents to the students different possibilities of use of signals and systems, their presentation, their parameters, time and frequency characteristics which are necessary for investigation of their behavior at data transfer into communication channels connected with the main processes of data transfer, processing and storage of information.

Educational Methods: The lectures are leading at lecture auditorium together for the students from specialties Communication Technique and Technology, Electronics and Computer Systems and Technologies. The exercises are leading for laboratory group of 10 students.
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DIGITAL ELECTRONIC

ECTS credits: 6	Semester: IV
Evaluation: Written exam	Hours per week: 2 lectures + 0 seminar exercises + 2 laboratory exercises
Course type: Lectures and laboratory exercises	Course status: Compulsory
	Degree course: Electronics

Lecturer: Assoc. Prof., Eng. Vladimir Gebov, PhD – askon@swu.bg
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Assistant: Assist. Prof., Eng. Emil Frenski – emil_f@swu.bg
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Annotation: The training course includes basic issues related to digital electronics sheets, parts and related connections between them.

Course Aims: Students to acquire the necessary minimum of theoretical and professional knowledge and skills for the implementation of the digital electronic, sheets and parts used in more popular provider in the world.

Educational Methods: Lectures, individual work and scientific literature textbook exercises, brainstorming and discussion, work individually, solve problems, exercise, and Power Point presentation.

POWER CONVERSION TECHNIQUES AND POWER SUPPLIES

ECTS credits: 6	**Semester:** IV
Evaluation: Written exam	**Hours per week:** 2 lectures + 0 seminar exercises + 2 laboratory exercises
Course type: Lectures and laboratory exercises	**Course status:** Compulsory
	Degree course: Electronics

Lecturer: ch. assistant Ivo Angelov, PhD – ivo.angelov@swu.bg
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Annotation: The course "Power Conversion Techniques and Power Supplies" introduces students to the power supply and converter devices used to power electronics equipment and computers. The principles of operation and design of the most common power supply and converter devices are discussed. Particular attention is paid to the converters of electric energy and the network power systems. At the base of the course are uncontrolled and controlled rectifiers and filters, linear and switched mode DC voltage stabilizers, inverters. Special attention is paid to UPS, autonomous and non-traditional sources of electricity. There is also laboratory practicum through which, practical skills are obtained and the students' ongoing knowledge is monitored.

Course aims: The aim of the course is to provide knowledge about the principles of operation and the structure of the most common power supply and converter devices. At the base of the course are uncontrolled and controlled rectifiers and filters, linear and switched mode stabilizers, overvoltage and overcurrent protections, inverters and others.

Educational Methods: Lectures are conducted in the classic way. Active methods are used by laboratories in a laboratory equipped with the necessary equipment and models, tests are conducted to control knowledge, and solving of relevant practical tasks is assigned.

THEORY OF AUTOMATIC CONTROL

ECTS credits: 6	**Semester:** IV
Evaluation: Ongoing assessment	**Hours per week:** 2 lectures + 0 seminar exercises + 2 laboratory exercises
Course type: Lectures and laboratory exercises	**Course status:** Compulsory
	Degree course: Electronics

Lecturer: Associate Professor Ljudmila Taneva – lucy_t@swu.bg
    Department: Electrical Engineering, Electronics and Automatics – technical_eea@swu.bg
    Faculty: Faculty of Engineering – technical@swu.bg
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Assistant: Rosen Spasov Yordanov – r.yordanov@abv.bg
    Department: Electrical Engineering, Electronics and Automatics – technical_eea@swu.bg
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    Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.
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Annotation: "Theory of automatic control" course is part of the study plan and includes 9 summarized topics. For assessment are used ongoing control and a coursework. The proposed curriculum includes: ACS (Automatic Control Systems) - basic concepts, principles of automatic control, control laws, types of control systems; mathematical models of control systems - differential equation, linearization, transmission function, block diagrams and transformations; characteristics of standard dynamic units and open ACS - time and frequency characteristics etc.

Course Aims: The aim of the course "Theory of automatic control" is to familiarize students with the theoretical foundations of analysis and synthesis of continuous automatic control systems (ACS). The knowledge gained in the field of classical control theory is used in the following disciplines – Instrumentation for Automation, Process Control Automation and others.

Educational Methods: Lectures using slides; laboratory exercises and simulations with MATLAB software. The workshops are conducted in the laboratory of the department, equipped with the necessary computers, analog devices and with installed MATLAB software. After each topic of study is completed, the students prepare report containing the topic of the exercise, its goal, tasks set and experimental data.

ELECTRICAL MEASUREMENTS

ECTS credits: 6	**Semester:** IV
Evaluation: Written exam	**Hours per week:** 2 lectures + 0 seminar exercises + 2 laboratory exercises
Course type: Lectures and laboratory exercises	**Course status:** Compulsory
	Degree course: Electronics

Lecturer: Assoc. Prof. Doc. (PhD) eng. Uliana Paskaleva – paskaleva_6@swu.bg, uli_6@abv.bg,

> *Department:* Electrical Engineering, Electronics and Automatics – technical_eea@swu.bg
> *Faculty:* Faculty of Engineering – technical@swu.bg
> *Address:* 2700 Blagoevgrad, 66 Ivan Mihailov str.
> *Phone:* +359-73-88 51 62

Annotation:

Course Aims: To familiarize students with the basic theoretical questions of measurement methods and tools for measuring electrical values. Understanding the basic metrological characteristics of measurement systems to learn to use in the laboratory, basic instrumentation (for voltage, current, power, energy, phase difference, frequency, parameters of bipolar, etc.).

Educational Methods: Lecture, demonstration, power point presentations, conversation, discussion, conference, analysis of problems, laboratory measurements, laboratory tests. Use interactive methods of training and during lectures and laboratory exercises.

FOREIGN LANGUAGE – III

ECTS credits: 4	**Semester:** V
Evaluation: Written exam	**Hours per week:** 0 lectures + 2 seminar exercises + 0 laboratory exercises
Course type: Lectures and laboratory exercises	**Course status:** Compulsory
	Degree course: Electronics

Lecturer: Assist. Prof. Bilyana Georgieva - bilianag@yahoo.com, bilianag@swu.bg
    Department: Electrical Engineering, Electronics and Automatics – technical_eea@swu.bg
    Faculty: Faculty of Engineering – technical@swu.bg
    Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.
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Annotation: The aim of the course „Foreign language - English" is to ensure the development of communication skills, reaching of certain phonetic, grammatical, lexical and thematic minimum, skills and habits for participation in real, communicative situations, knowledge and individual work with vocabulary. It aims to review and systematize the basic knowledge of the undergraduates and provides equal start level for the next stage of education, called "language of the programme". The choice of topics is based on their high particularly in the scientific style of speech and their unconditional structural significance and necessity of learning a foreign language. Widely used communicative exercises focus that strengthen the necessary grammatical habits and encourage students to be active speech activity in the studied subjects. The practical course is based on the thematic texts reflecting everyday student life, elementary special technical terminology on the subject and aims to stimulate the desire and motivation of students to enhance their language and consistent level – Elementary and Pre-intermediate.

Course aim: The aim of the course is to build an initial communicative competence, as the ability to understand and draw meaningful oral and written statements, in accordance with the rules of the English language to develop reading skills and comprehension of texts from everyday communication and presentation and related texts the basic terms in the specialty; develop skills in technical vocabulary can make translations of technical texts from English into Bulgarian language using a dictionary.

Education Methods: Active methods are used through different exercises; based tests are made for control of the learned, translation of technical literature.

DESIGN AND RELIABILITY OF ELECTRONICS EQUIPMENT

ECTS credits: 6	**Semester:** V
Evaluation: Written exam	**Hours per week:** 2 lectures + 0 seminar exercises + 2 laboratory exercises
Course type: Lectures and laboratory exercises	**Course status:** Compulsory
	Degree course: Electronics

Lecturer: Assoc. Prof. Doct. (PhD) eng. Uliana Paskaleva – paskaleva_6@swu.bg, uli_6@abv.bg,

> *Department:* Electrical Engineering, Electronics and Automatics – technical_eea@swu.bg
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Annotation:

Course aim: At the end of the course students should gain knowledge on the general characteristics of the processes of design, construction and manufacture of electronic and communications equipment - process control, technology training, precision manufacture of electronic components and equipment, knowledge of main indicators of reliability of renewable and non-renewable electronic products, test methods for reliability, etc.

Educational Methods: Lecture, demonstration, power point presentations, conversation, discussion, analysis of problems, laboratory measurements, laboratory test teamwork in the design of electronic assemblies. Use interactive methods of training and during lectures and laboratory exercises.

TELECOMMUNICATION TECHNIQUES

ECTS credits: 6	Semester: V
Evaluation: Written exam	Hours per week: 2 lectures + 0 seminar exercises + 2 laboratory exercises
Course type: Lectures and laboratory exercises	Course status: Compulsory
	Degree course: Electronics

Lecturer: Assoc. Prof., Eng. Gabriela Atanasova, PhD – gatanasova@swu.bg
　　Department: Communication and Computer Engineering – technical_kktt@swu.bg
　　Faculty: Faculty of Engineering – technical@swu.bg
　　Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.
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Assistant: Assist. Eng. Liliia Kiprova – lilya_kiprova@swu.bg
　　Department: Communication and Computer Engineering – technical_kktt@swu.bg
　　Faculty: Faculty of Engineering – technical@swu.bg
　　Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.
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Annotation: The course provides fundamental data on telecommunication systems, fundamental structure of telecommunication system, terminal equipment, telecommunication switching systems, telecommunication transmission systems. Services provided by telecommunication systems. The course offers also basic information about telecommunication networks.

Course aim: The aim of the course is introduce students to basic information about the contemporary state of telecommunication technology. It deals on a sufficient scale with fundamental structure of telecommunication system, terminal equipment, telecommunication switching systems, telecommunication transmission systems, services provided by telecommunication systems. The course offers also basic information about telecommunication networks - fixed and mobile networks, Intelligent Network (IN), Next Generation Networks (NGN).

Educational Methods: Lectures and laboratory exercises.

PROJECT IN DIGITAL ELECTRONIC

ECTS credits: 3	Semester: V
Evaluation: Ongoing assessment	Hours per week: 0 lectures + 0 seminar exercises + 2 laboratory exercises
Course type: Laboratory exercises	Course status: Elective
	Degree course: Electronics

Lecturer: Assoc. Prof., Eng. Vladimir Gebov, PhD – askon@swu.bg
Department: Electrical Engineering, Electronics and Automatics – technical_eea@swu.bg
Faculty: Faculty of Engineering – technical@swu.bg
Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.
Phone: +359-73-88 51 62

Assistant: Assist. Prof., Eng. Emil Frenski – emil_f@swu.bg
Department: Communication and Computer Engineering – technical_kktt@swu.bg
Faculty: Faculty of Engineering – technical@swu.bg
Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.
Phone: +359-73-88 51 62

Annotation: The training course includes basic issues related to digital electronics sheets, parts and related connections between them, with more practical goal.

Course aim: Students to acquire the necessary minimum of theoretical and professional knowledge and skills for the implementation of the digital electronic, sheets and parts used in more popular provider in the world.

Educational Methods: Individual work and scientific literature textbook exercises, brainstorming and discussion, work individually, solve problems, exercise, and Power Point presentation and written project on Microsoft Word.

PROJECT IN POWER CONVERSION TECHNIQUES

ECTS credits: 2	Semester: V
Evaluation: Ongoing assessment	Hours per week: 0 lectures + 0 seminar exercises + 2 laboratory exercises
Course type: Laboratory exercises	Course status: Elective
	Degree course: Electronics

Lecturer: ch. assistant Ivo Angelov, PhD – ivo.angelov@swu.bg
Department: Communication and Computer Engineering – technical_kktt@swu.bg
Faculty: Faculty of Engineering – technical@swu.bg
Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.
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Annotation: The course "Project in Power Conversion Technique" introduces students to the power supply and converter devices for power electronics and computers. Attention is drawn to the design of a particular power system, defined as individual task. Each student specific terms task with defined requirements and should then design a device meeting the requirements. The result is formed as coursework.Skills and habits to transfer knowledge into practice are obtained through the planned exercises, and also the ongoing monitoring of students' knowledge is conducted.

Course aim: The aim of the course is to acquire knowledge and skills for the principles of operation, structure, and methodology of designing of the most common power supply and converter devices.

Educational Methods: Laboratory exercises are conducted in a computer lab. Planned are frontal talks, dialogue with the active students and justifying their opinions in discussing and solving practical tasks. Prints of relevant theoretical parts and tasks inform students about topics of specific exercises and additional literature.

Requirements/Prerequisites: Basic knowledge in Electrical Engineering, Components in Electronics, Analog Electronics.

Registration for the Course: by request at the end of the 7 semester (the course is not obligatory).

Registration for the Exam: coordinated with the lecturer and Students Service Department.

WEB DESIGN

ECTS credits: 6	Semester: V
Evaluation: Written exam	Hours per week: 2 lectures + 0 seminar exercises + 2 laboratory exercises
Course type: Lectures and laboratory exercises	Course status: Elective
	Degree course: Electronics

Lecturer: Associate Professor Stanko Shtrakov - sshtrakov@swu.bg
  Department: Electrical Engineering, Electronics and Automatics – technical_eea@swu.bg
  Faculty: Faculty of Engineering – technical@swu.bg
  Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.
  Phone: +359-73-88 51 62

Annotation: The subject "Web design" focuses on gaining knowledge and skills in the field of Internet programming. The course covers the basic principles of programming with HTML and some software packages for creating WEB sites. Students learn the basics of programming languages PHP, Java and Java Script and the use of database applications for the Internet. The laboratory work helps to better rationalization of lecture material and contribute to formation of practical skills.

Course aim: The course aims to provide students with knowledge of modern programming languages (visual and object programming) and their application to solve different types of problems, and some of the main tools for creating WEB applications.

Educational Methods: Lectures (with slides, multimedia projector) and additional text materials; laboratory work (based on instructions) with a tutorial for every laboratory theme.

Requirements/Prerequisites: Basic knowledge in informatics.

Assessment: computer test , two problems solving tests per semester

Registration for the Course: by request at the end of the current semester

Registration for the Exam: coordinated with lecturer and Student Service Department

APPLICATIONS FOR MOBILE OPERATION SYSTEMS

ECTS credits: 6	**Semester:** V
Evaluation: Written exam	**Hours per week:** 1 lectures + 0 seminar exercises + 2 laboratory exercises
Course type: Lectures and laboratory exercises	**Course status:** Elective
	Degree course: Electronics

Lecturer: Associate Professor Stanko Shtrakov - sshtrakov@swu.bg
Department: Electrical Engineering, Electronics and Automatics – technical_eea@swu.bg
Faculty: Faculty of Engineering – technical@swu.bg
Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.
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Annotation: The subject " Applications for mobile operation systems " focuses on gaining knowledge and skills in the field of Internet programming for mobile operating systems. The course covers the basic principles of programming with Java and some software packages for creating an applications for mobile OS. Students learn the basics of programming languages Java and Java Script and the use of database applications for the Internet. The laboratory work helps to better rationalization of lecture material and contribute to formation of practical skills.

Course Aims: The course aims to provide students with knowledge of modern programming languages (visual and object programming) and their application to solve different types of problems, and some of the main tools for creating WEB applications.

Educational Methods: Lectures (with slides, multimedia projector) and additional text materials; laboratory work (based on instructions) with a tutorial for every laboratory theme.

Requirements/Prerequisites: Basic knowledge in informatics.

Assessment: computer test , two problems solving tests per semester

Registration for the Course: by request at the end of the current semester

Registration for the Exam: coordinated with lecturer and Student Service Department

PROGRAMING LOGICAL CONTROLLERS

ECTS credits: 7	**Semester:** VI
Evaluation: Written exam	**Hours per week:** 1 lectures + 0 seminar exercises + 2 laboratory exercises
Course type: Lectures and laboratory exercises	**Course status:** Compulsory
	Degree course: Electronics

Lecturer: Assoc. Prof., Eng. Vladimir Gebov, PhD – askon@swu.bg
    Department: Electrical Engineering, Electronics and Automatics – technical_eea@swu.bg
    Faculty: Faculty of Engineering – technical@swu.bg
    Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.
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Annotation: The training course includes basic issues related to programing logical controllers, basic principle and parameters which are used for controlling different technological processes.

Course Aims: Students to acquire the necessary minimum of theoretical and professional knowledge and skills for the implementation of the programing logical controllers. Base principle of the programing and using the controlers.

Educational Methods: Lectures, individual work and scientific literature textbook exercises, brainstorming and discussion, work individually, solve problems, exercise, and Power Point presentation.

SENSORS AND SENSOR NETWORKS

ECTS credits: 6	Semester: VI
Evaluation: Written exam	Hours per week: 2 lectures + 0 seminar exercises + 3 laboratory exercises
Course type: Lectures and laboratory exercises	Course status: Compulsory
	Degree course: Electronics

Lecturer: Assoc.Prof.Eng. Ivanka Georgieva, PhD – vanyakg@swu.bg
    Department: Electrical Engineering, Electronics and Automatics – technical_eea@swu.bg
    Faculty: Faculty of Engineering – technical@swu.bg
    Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.
    Phone: +359-73-88 51 62

Assistants: Assist. Prof., Eng. Filip Tsvetanov, PhD– ftsvetanov@swu.bg
    Department: Communication and Computer Engineering – technical_kktt@swu.bg
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Annotation: The course on "Sensors and sensor networks" covers basic questions relating to the characteristics, structures and operating principles of sensors, design and construction of sensor networks. Exam in "Sensors and sensor networks" will acquire the necessary minimum of theoretical knowledge and practical skills in the choice of sensors, and design and construction of wired and wireless sensor networks.

Course Aims: The aim of the "Sensors and sensor networks" is students to receive broad basic knowledge of the physical essence and structure of sensors, principles of operation, the processing of signals, construction of intelligent sensors and sensor networks. To learn about the fields of application interfaces to sensors and the criteria for their selection, to acquire practical skills for embedding sensors in systems for management and control of technological processes and monitoring processes.

Educational methods: Lectures, individual work with scientific literature, textbooks work, brainstorming and discussions, individual problem solving, exercises and the Power Point presentation.

PROJECT DESIGN OF ELECTRONIC EQUIPMENT

ECTS credits: 2	**Semester:** VI
Evaluation: Written exam	**Hours per week:** 0 lectures + 0 seminar exercises + 2 laboratory exercises
Course type: Lectures and laboratory exercises	**Course status:** Elective
	Degree course: Electronics

Lecturer: Assoc. Prof. Doct. (PhD) eng. Uliana Paskaleva - paskaleva_6@swu.bg, uli_6@abv.bg,

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Assistant: Assist. Eng. Liliia Kiprova – lilya_kiprova@swu.bg

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> *Address:* 2700 Blagoevgrad, 66 Ivan Mihailov str.
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Annotation:

Course Aims: At the end of the course students should acquire skills in the processes of design, development and manufacture of electronic and communications equipment - process control, training, technology, precision manufacturing of electronic components and equipment, knowledge of the main indicators of reliability of renewable and non-electronic products , methods for testing the reliability, etc.

Educational methods: Theory, methods for the design of electronic assemblies, calculations, discussions, problem analysis, laboratory measurements, laboratory test teamwork in the design of electronic modules. Use interactive teaching methods and during exercise.

AUTOMATION OF ELECTRONIC MANUFACTURING

ECTS credits: 6	**Semester:** VII
Evaluation: Written exam	**Hours per week:** 2 lectures + 0 seminar exercises + 3 laboratory exercises
Course type: Lectures and laboratory exercises	**Course status:** Compulsory
	Degree course: Electronics

Lecturer: Assoc.Prof.Eng. Ivanka Georgieva, PhD – vanyakg@swu.bg
   Department: Electrical Engineering, Electronics and Automatics – technical_eea@swu.bg
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Assistants: Assist. Prof. Lubomir Markov- lmarkov@swu.bg
   Department: Electrical Engineering, Electronics and Automatics – technical_eea@swu.bg
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Annotation: The course on "Automation of electronic manufacturing" introduces students to the tasks solved by automation of electronic manufacturing. Structure of electronic manufacturing, automation of individual steps of the electronic manufacturing as well as the specifics of the process for automated Manufacturing of base electronic components, PCB assembly and diagnosis of electronic devices. Introduces students to the latest technology for e-Manufacturing.

Course Aims: Purpose of the course "Automation of electronic manufacturing" students to acquire knowledge about the objectives, tasks, postulates, problems in manufacturing automation. To learn about basic systems for automated manufacturing and the structure of the electronic manufacturing, and the means for automation of basic electronic circuits and devices. Realize and comprehend the need for diagnostics of the electronic components that make up the electronic systems, and the importance of the right choice of method and approach for diagnosis.

Educational methods: Lectures, individual work with scientific literature, textbooks work, brainstorming and discussions, individual problem solving, exercises and the Power Point presentation.

SECURITY SYSTEMS AND MONITORING

ECTS credits: 6	Semester: VII
Evaluation: Written exam	Hours per week: 2 lectures + 0 seminar exercises + 3 laboratory exercises
Course type: Lectures and laboratory exercises	Course status: Compulsory
	Degree course: Electronics

Lecturer: Assoc.Prof.Eng. Ivanka Georgieva, PhD – vanyakg@swu.bg
  Department: Electrical Engineering, Electronics and Automatics – technical_eea@swu.bg
  Faculty: Faculty of Engineering – technical@swu.bg
  Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.
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Assistants: Assist. Prof., Eng. Filip Tsvetanov, PhD– ftsvetanov@swu.bg
  Department: Communication and Computer Engineering – technical_kktt@swu.bg
  Faculty: Faculty of Engineering – technical@swu.bg
  Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.
  Phone: +359-73-88 51 62

Annotation: The course on „Security Systems and Monitoring"introduces students to the methodology for the design of security systems and monitoring for different purposes at different objects and with different objectives. Students learn the components for the construction of security systems and monitoring, requirements in their choice. The systematization of this knowledge allows for practical work and design of these systems

Course Aims: The course aims Security systems and monitoring students acquire knowledge about the objectives, tasks, physical nature of engineering and technical means for the construction of security system and monitoring. Students to learn about the fields of application. To acquire practical skills for the design of wireless security systems.

Educational methods: Lectures, individual work with scientific literature, textbooks work, brainstorming and discussions, individual problem solving, exercises and the Power Point presentation.

FUNDAMENTALS OF NANOTECHNOLOGY

ECTS credits: 6	**Semester:** VII
Evaluation: Written exam	**Hours per week:** 2 lectures + 1 seminar exercises + 1 laboratory exercises
Course type: Lectures, seminar and laboratory exercises	**Course status:** Compulsory
	Degree course: Electronics

Lecturer: Assoc. Prof. Dimitrina Kerina, PhD – d_kerina@swu.bg
    Department: Communication and Computer Engineering – technical_kktt@swu.bg
    Faculty: Faculty of Engineering – technical@swu.bg
    Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.
    Phone: +359-73-88 51 62

Annotation: Main topics of the course are: Introduction of nanomaterial's knowledge, Methods of preparation and characterization of nano - scale materials, Nanoelectronics and Nanomagnetics and Methods of information recording and storage.

Course Aims: The course in Fundamentals of Nanotechnologies aims to provide knowledge about methods of preparation and characterization of nano-scale objects and methods of information recording and storage.

Educational Methods: Lectures are prepared on Power point. The contemporary technical equipment as multimedia, software, models, etc. is used for these lectures. Lectures are visualized by demonstrations and laboratory tasks performance during the seminar and laboratory classes.

COMPUTER SIMULATION WITH MATLAB

ECTS credits: 6	Semester: VII
Evaluation: Ongoing assessment	Hours per week: 2 lectures + 0 seminar exercises + 0 laboratory exercises
Course type: Lectures and laboratory exercises	Course status: Elective
	Degree course: Electronics

Lecturer: Assoc. Prof. Ivan Trenchev, PhD – trenchev@swu.bg
   Department: Electrical Engineering, Electronics and Automatics – technical_eea@swu.bg
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Annotation: MATLAB is a special-purpose language that is an excellent choice for writing moderate-size programs that solve problems involving the manipulation of numbers. The design of the language makes it possible to write a powerful program in a few lines. The problems may be relatively complex, while the MATLAB programs that solve them are relatively simple: relative, that is, to the equivalent program written in a general-purpose language, such as C++ or Java. As a result, MATLAB is being used in a wide variety of domains from the natural sciences through all disciplines of engineering to finance and beyond, and it is heavily used in industry. Hence, a solid background in MATLAB is an indispensable skill in today's job market.

Course Aims: This course is not a MATLAB tutorial. It is an introductory programming course that happens to use MATLAB to illustrate general concepts in computer science and programming. Students who successfully complete this course will:

- become familiar with general concepts in computer science
- gain an understanding of the general concepts of programming
- obtain a solid foundation in the use of MATLAB

COMPUTER ANALYSIS OF ENGINEERING PROBLEMS

ECTS credits: 6	**Semester:** VII
Evaluation: Written exam	**Hours per week:** 2 lectures + 0 seminar exercises + 2 laboratory exercises
Course type: Lectures and laboratory exercises	**Course status:** Elective
	Degree course: Electronics

Lecturer: Assoc. Prof. Stefan M. Stefanov
     Department: "Informatics"
     Faculty: Faculty of Mathematics and Natural Sciences
     Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.
     Phone: 073/ 588 532

Assistant: Ass. Prof. Anka Markovska PhD – a_markovska@swu.bg
     Department: Electrical Engineering, Electronics and Automatics – technical_eea@swu.bg
     Faculty: Faculty of Engineering – technical@swu.bg
     Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.
     Phone: +359-73-88 51 62

Annotation: The course in Computer Analysis of Engineering Problems includes basic numerical methods for mathematical computations in mathematical analysis, algebra and differential equations, which are applicable for solving various engineering problems, physics problems, etc.: computer representation of real numbers as well as sources of errors and propagation of errors is considered; interpolation and least squares data fitting as methods for approximating functions given by tabulated data; numerical differentiation; numerical integration (Newton-Cotes quadrature formulas); numerical solution of nonlinear equations; numerical methods for solving systems of linear equations: exact methods and iterative methods; power method for calculating the absolutely greatest eigenvalue of a matrix; numerical solution of the initial-value problem for ordinary differential equations of first order; numerical solution of boundary value problem for ordinary differential equations of second order.

Course Aims: Students should obtain knowledge and skills for numerical solution of basic problems in the area of mathematical analysis, algebra and differential equations, which are applicable for solving various engineering problems, physics problems, etc.

Educational Methods: lectures and lab exercises

COMPUTERIZED DEVICES AND SYSTEMS WORK IN REAL TIME

ECTS credits: 5	Semester: VIII
Evaluation: : Ongoing assessment	Hours per week: 2 lectures + 0 seminar exercises + 2 laboratory exercises
Course type: Lectures and laboratory exercises	Course status: Compulsory
	Degree course: Electronics

Lecturer: Ass. Radoslav Mavreski
Department: Electrical Engineering, Electronics and Automatics – technical_eea@swu.bg
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Annotation: Real-Time systems are becoming pervasive. Typical examples of real-time systems include Air Traffic Control Systems, Networked Multimedia Systems, Command Control Systems etc. In a Real-Time System the correctness of the system behavior depends not only on the logical results of the computations, but also on the physical instant at which these results are produced. Real-Time systems are classified from a number of viewpoints i.e. on factors outside the computer system and factors inside the computer system. Special emphasis is placed on hard and soft real-time systems. A missed deadline in hard real-time systems is catastrophic and in soft real-time systems it can lead to a significant loss. Hence predictability of the system behavior is the most important concern in these systems. Predictability is often achieved by either static or dynamic scheduling of real-time tasks to meet their deadlines. Static scheduling makes scheduling decisions at compile time and is off-line. Dynamic scheduling is online and uses schedulabilty test to determine whether a set of tasks can meet their deadlines. The present paper talks about static and dynamic scheduling algorithms and operating systems support for these mechanisms.

Educational Methods: lectures and seminars

AUTOMOTIVE ELECTRONICS

ECTS credits: 5	**Semester:** VIII
Evaluation: Ongoing assessment	**Hours per week:** 2 lectures + 0 seminar exercises + 2 laboratory exercises
Course type: Lectures and laboratory exercises	**Course status:** Elective
	Degree course: Electronics

Lecturer: Assist. Prof. Ivo Angelov, PhD – ivo.angelov@swu.bg
  Department: Communication and Computer Engineering – technical_kktt@swu.bg
  Faculty: Faculty of Engineering – technical@swu.bg
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Annotation: The course "Automotive Electronics" acquaints students with basic electric and electronic systems in modern cars. The structure and principles of operation of the starting system, ignition system, electronic control of mixture formation, engine management systems, and electric chassis systems for comfort and safety are examined.There is also laboratory practicum through which, practical skills are obtained and the students' ongoing knowledge is monitored.

Course aims: The aim of the course is to provide knowledge about the principles of operation and the structure of the main electrical and electronic systems in the car. Students acquire initial practical skills to be able to perform measurement, control, diagnostics and settings of the parameters, controlled by electronic systems.

Educational Methods: Lectures are conducted in the classic way, students get acquainted consecutively with the provided material. The lectures are richly illustrated with graphic material presented on film or video projector. Laboratory exercises are conducted in a specialized laboratory in a separate garage.

Requirements/Prerequisites: Basic knowledge in Engineering Physics, Electrical Engineering, Components in Electronics, Electrical Measurements, Analog Electronics, Digital Electronics.

COMPUTER BASED AUTOMOTIVE DIAGNOSTIC SYSTEMS

ECTS credits: 5	**Semester:** VIII
Evaluation: Ongoing assessment	**Hours per week:** 2 lectures + 0 seminar exercises + 2 laboratory exercises
Course type: Lectures and laboratory exercises	**Course status:** Elective
	Degree course: Electronics

Lecturer: Assist. prof. Ivo Angelov - ivo.angelov@swu.bg
Department: Communication and Computer Engineering and Technologies – technical_kktt@swu.bg
Faculty: Faculty of Engineering – technical@swu.bg
Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.
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Annotation: The course "Automotive Electronics" acquaints students with basic electric and electronic systems in modern cars. The structure and principles of operation of the starting system, ignition system, electronic control of mixture formation, engine management systems, and electric chassis systems for comfort and safety are examined. There is also laboratory practicum through which, practical skills are obtained and the students' ongoing knowledge is monitored.

Course aims: The aim of the course is to provide knowledge about the principles of operation and the structure of the main electrical and electronic systems in the car. Students acquire initial practical skills to be able to perform measurement, control, diagnostics and settings of the parameters, controlled by electronic systems.

Educational Methods: Lectures are conducted in the classic way, students get acquainted consecutively with the provided material. The lectures are richly illustrated with graphic material presented on film or video projector. Laboratory exercises are conducted in a specialized laboratory in a separate garage.

Requirements/Prerequisites: Basic knowledge in Engineering Physics, Electrical Engineering, Components in Electronics, Electrical Measurements, Analog Electronics, Digital Electronics.

ELECTRONIC CONTROL DEVICES FOR ALTERNATIVE ENERGY SOURCES

ECTS credits: 5	**Semester:** VIII
Evaluation: Written exam	**Hours per week:** 2 lectures + 0 seminar exercises + 2 laboratory exercises
Course type: Lectures and laboratory exercises	**Course status:** Elective
	Degree course: Electronics

Lecturer: Associate Professor Stanko Shtrakov - sshtrakov@swu.bg
Department: Electrical Engineering, Electronics and Automatics – technical_eea@swu.bg
Faculty: Faculty of Engineering – technical@swu.bg
Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.
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Annotation: The subject "Electronic control devices for alternative energy sources" focuses on gaining knowledge and skills in the field of alternative energy resources and control devices for installations utilizing this energy. The course covers the basic principles of work, management technologies and automation of renewable energy infrastructure and their connection with conventional energy. The laboratory work helps to better rationalization of lecture material and contribute to formation of practical skills.

Course Aims: The course aims to provide students with knowledge of the principles of the electronic control devices for RES. They should be able to make assessments on the use of renewable energy and the necessary additional equipment for the management of energy resources

Educational Methods: Lectures (with slides, multimedia projector) and additional text materials; laboratory work (based on instructions) with a tutorial for every laboratory theme.

Auxilary means for teaching: Computer, development software, Internet and a tutorial for every laboratory theme.