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INFORMATION PACKAGE

/ECTS/

FIELD OF HIGHER EDUCATION: **5. TECHNICAL SCIENCES**
PROFESSIONAL FIELD: **5.3. COMMUNICATION AND COMPUTER
ENGINEERING**
SPECIALTY: **COMPUTER SYSTEMS AND TECHNOLOGIES**

QUALIFICATION CHARACTERIZATION OF

SPECIALTY: **“COMPUTER SYSTEMS AND TECHNOLOGIES”**
EDUCATIONAL AND QUALIFICATION DEGREE: **BACHELOR OF SCIENCE**
PROFESSIONAL QUALIFICATION: **ENGINEER**
PERIOD OF STUDY: **4 YEARS (8 SEMESTERS)**
FORM OF TRAINING: **REGULAR**

REQUIREMENTS FOR THE SPECIALIST PREPARATION

Engineers specializing in "Computer Systems and Technologies," Bachelor's degree level, must be prepared to perform activities such as: design, manufacture, and operation of components and devices in computer and communication systems and networks; research, implementation, modeling, and operation of facilities, specialized technological equipment, and communication means with stationary and mobile objects; operation and maintenance of information tools and technologies to support marketing activities in the field of computer and communication technology; design and maintenance of technical means for automation, control, and technological support of mobile communication systems; design and software support of computer tools for managing communication equipment; ensuring quality of service through measurement and control of parameters in computer and communication networks and systems, as well as application of methods for digital information processing and protection.

Acquisition of knowledge, skills, and competencies for these activities requires training that provides:

Theoretical knowledge to design and operate components and devices based on analog, digital, and optical principles, for systems processing and transmitting analog and digital information;

Practical knowledge, skills, and habits acquired through seminars, laboratory, and practical exercises aligned with the nature of their future work;

Adaptability to changing conditions in professional practice;

Use of modern computer technology to automate their work and business processes.

This knowledge is obtained based on fundamental and specialized training and specialized courses in computer and information technologies, enhancing the professional skills of the specialist. The curriculum allows students to improve their written and spoken culture, as well as to familiarize

themselves with the history and development of electronic and computer technology.

The education of specialists in the bachelor's program "Computer Systems and Technologies" is aligned with Bulgarian and international experience, based on a thorough analysis of curricula and programs for similar specialties at national and foreign universities, colleges, and institutes.

PROFESSIONAL SKILLS AND COMPETENCIES

Graduates of the "Computer Systems and Technologies" bachelor's program acquire professional skills and competencies to:

Manage complex professional activities, including teams and resources;

Maintain standards and technical specifications of computer systems and equipment;

Apply computer and information technologies for configuration, control, diagnostics, and maintenance of computer and telecommunication systems and networks;

Develop, use, implement, and operate systems in the field of computer and communication systems — stationary, mobile, and wireless communications;

Process, store, and transmit information; apply security technologies and information protection methods.

FIELD OF PROFESSIONAL REALIZATION

A Bachelor in Computer Systems and Technologies can find employment in all private, corporate, and government companies, government administration, security and defense services, whose scope of activity involves telecommunications, computer and information technologies, production, operation, engineering, installation and service, sales and distribution, maintenance, and administration of equipment and networks. They can work as team leaders or managers in positions requiring higher education in this specialty. Graduates may also continue their education in doctoral programs.

POSITIONS THAT CAN BE HELD ACCORDING TO THE NATIONAL CLASSIFIER OF PROFESSIONS AND POSITIONS

According to the National Classifier of Professions and Positions, graduates of "Computer Systems and Technologies," Bachelor's degree, may hold positions such as:

- Director of Information Systems
- Director/Manager of Information Technology
- Head of Information Services
- Head of Computer Services
- Head of Computer Systems: Systems Development
- Head of Computer systems and technologies
- Network Manager
- Software Applications Manager
- Internet Delivery Manager
- Computer Database Analyst
- Computer Communications Analyst
- Computer Systems and Networks Analyst
- Computer Systems and Networks Engineer
- Software Engineer
- Hardware Engineer

- Database System Software Expert
- System Support and Information Security Expert
- Information Technology System Analyst
- Analysis and Design Expert
- Design and Programming Expert
- System Support Expert
- Technological Maintenance Expert
- System Architect

DEGREE COURSE OF "COMPUTER SYSTEMS and TECHNOLOGIES" CURRICULUM

First academic year			
First Semester	ECTS credits	Second Semester	ECTS credits
Engineering Mathematics I	6	Engineering Mathematics II	6
Foreign Language I	3	Electrotechnical Materials	5
Programming I	5	Electrical Engineering	6
Fundamentals of Engineering Design	5	Foreign Language II	3
Engineering Physics	5	Programming and Data Structures	5
Computer Graphics and 3D Technologies	5	Electrical Measurements	5
Sports	1	Sports	1
	Total: 30		Total: 30
Second academic year			
First Semester	ECTS credits	Second Semester	ECTS credits
Basics of Network Technologies	5	Digital Electronics	6
Programming II	6	Power conversion techniques and power supplies	5
Analog Electronics	5	Fundamentals of Cyber Security	4
Introduction to Cloud Technologies	6	Computer Architectures	6
Technological Practicum I	3	Programming by Python	5
Signals and Systems	5	Introduction to Software Technologies	4
	Total: 30		Total: 30
Third academic year			
First Semester	ECTS credits	Second Semester	ECTS credits
First group elective courses	6	Databases	6
Foreign language III	4	Microprocessor technology	6
Technological practicum II	5	Fundamentals of Nanotechnology	4
Synthesis and analysis of algorithms	6	Operating Systems	6
Computer peripherals and interfaces	6	Sensors and sensor networks	6

Technological practicum II	3 Total: 30	Third group elective courses	2 Total: 30
Fourth academic year			
First semester	ECTS credits	Second semester	ECTS credits
Internet technologies	6	Fifth group elective courses	4
Applications for mobile operating systems	6	Sixth group elective courses	4
Computer networks I	6	Computer networks II	6
<i>Technological Practice III:</i>	2	Manufacturing practice	6
Fourth group elective courses	6	Graduation	10
Network and information security	4		
	Total: 30		Total: 30

TOTAL: 240 CREDITS FOR FOUR ACADEMIC YEARS

ENGINEERING MATHEMATICS I

ECTS credits: 6	Semester: 1st
Evaluation: written exam	Hours per week: 2 lectures + 2 exercises
Course type: lectures+ exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

Lecturer: Associate Professor Vasil Grozdanov - vassgroz@swu.bg

Assistant: Assist. Prof. Yordanka Angelova - y.angelova@swu.bg

Department:

Faculty: Faculty of Engineering – technical@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.

Annotation

The curriculum deals with issues of linear algebra, analytical geometry and differential calculus of a variable. The basic concepts of complex numbers are given. Matrix, determinants, systems of linear equations and methods for their solution, linear spaces and linear transformations / operators /, quadratic forms of analytical geometry, vectors and actions with them, lines and planes, lines and surfaces of second degree are studied. . The main task of the course is to provide fundamental preparation of students majoring in "Computer systems and technologies" to master the other mathematical and technical disciplines included in the curriculum and apply their theoretical knowledge in solving specific problems in informatics.

Purpose of the course

The aim of this course is for students to be able to solve systems of linear equations by both methods - Gauss and Kramer's formulas, to apply the studied theory for modeling and solving real practical problems; to master one of the classical methods for studying geometric objects - the analytical one; be able to match algebraic objects, determine their properties and be able to transfer them to others that are difficult to study.

Educational Methods

The course is held in lecture halls. The exercises are conducted in groups in a computer room, and usually the groups are composed of 10-15 students.

Prerequisites

Basic knowledge of algebra, geometry, trigonometry, stereometry is desirable

Enrollment for training in the discipline

The course is studied by all students majoring in Information and Communication Technology, as it is mandatory

Exam registration

The enrollment for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the laboratory exercises and the training department.

FOREIGN LANGUAGE I

ECTS credits: 3	Semester: 1st
Evaluation: ongoing assessment	Hours per week: 0 lectures+3 seminar exercises +0 laboratory exercises
Course type: seminar exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

Lecturer: Assist. Prof. Bilyana Georgieva, PhD – 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.

Annotation

The course "Foreign Language" aims to ensure the development of communicative skills, mastery of a certain phonetic, grammatical, lexical and thematic minimum, skills and habits for participation in real, communicative situations, knowledge and independent work with vocabulary. It aims to negotiate and systematize the basic knowledge of students and provides a unified starting level for the next stage of training, called "language of the specialty". The choice of topics is based on their high specificity in the scientific style of speech and their unconditional structural significance and necessity in the process of learning a foreign language. Exercises with communicative orientation are widely used, which strengthen the necessary grammatical habits and encourage students to active speech activity within the studied topics. The practical course is based on thematic texts reflecting the student's daily life, basic special technical terminology in the specialty and aims to stimulate the desire and motivation of students to improve their knowledge of a foreign language and corresponds to the level - Elementary and Pre-intermediate.

Purpose of the course

The aim of the course is to build initial communicative competence, as the ability to understand and compose orally and in writing meaningful statements, in accordance with the rules of the English language, to develop skills for reading and comprehension of texts from everyday communication and presentation, as well as texts related with the main terms of the specialty; To develop skills for working with a technical dictionary, To be able to translate technical texts from English into Bulgarian with the help of a dictionary.

Educational Methods

Active methods are used through exercises, tests for knowledge control are conducted, and solving of relevant practical classes, translation of technical literature is assigned.

Prerequisites

Basic knowledge of English is desirable

Enrollment for training in the discipline

The course is studied by all students majoring in Information and Communication Technology, as it is mandatory.

Exam registration

The enrollment for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the laboratory exercises and the training department.

PROGRAMMING I

ECTS credits: 5	Semester: 1st
Evaluation: written exam	Hours per week: 2 lectures+2 laboratory exercises
Course type: lectures + laboratory exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

Lecturer: Assoc. Prof. Ivan Trenchev, PhD – trenchev@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.

Annotation

The course focuses on C ++ programming - an object-oriented programming language based on the C language. The successful combination of the good sides of the C language and the tools for object-oriented programming are the reason for the great popularity and widespread use of C ++. The course provides knowledge about the basic ideas and characteristics of computers, programming, programming languages, algorithms. The Dev C ++ and CodeBlocks programming environments, error handling, data types, comments, input and output, variables and constants, operators, procedures and functions are introduced. Skills for working with cyclic structures and arrays are formed.

Purpose of the course

The main goal of the course is to master the principles of programming and the basics of the C ++ programming language, forming skills for compiling and implementing algorithms.

Upon successful completion of the Programming course, students will:

- know the main data types of C ++, variables and constants;
- work with streaming input and output;
- work with branched structures, numerical comparisons and Boolean operations;
- understand the structuring of code through functions, the concept of transmission
- parameters, documentation, scope of variables, recursion;
- use cyclic structures;
- work with arrays.

Educational Method

The course is held in lecture halls together with the students from the bachelor programs of the Technical Faculty. The exercises are held in groups, as the groups are usually composed of 12 students.

Prerequisites

Basic knowledge of mathematics is desirable.

Enrollment for training in the discipline:

The course is studied by all students majoring in Information and Communication Technology, as it is mandatory.

Exam registration:

The enrollment for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the laboratory exercises and the training department.

FUNDAMENTALS OF ENGINEERING DESIGN

ECTS credits: 5	Semester: 1st
Evaluation: ongoing assessment	Hours per week: 1 lecture+3 laboratory exercises
Course type: lectures + exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

Lecturer: Assoc. Prof., Eng. Evdokia Petkova - e.p.petkova@swu.bg

Assistant: Assoc. Prof., Eng. Evdokia Petkova - e.p.petkova@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.

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.

Prerequisites

Basic knowledge of mathematics, basic computer literacy is desirable.

Enrollment for training in the discipline

The course is studied by all students majoring in Information and Communication Technology, as it is mandatory.

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department

ENGINEERING PHYSICS

ECTS credits: 5	Semester: 1st
Evaluation: written exam	Hours per week: 2 lectures+1 laboratory exercise
Course type: lectures + laboratory exercises	Course status: Compulsory
	Degree course Computer systems and technologies

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.

Assistant: Assoc. Prof., Eng. Raika Stoyanova, PhD – rajka@swu.bg

Department: Mechanical Engineering and Technologies – technical_mtt@swu.bg

Annotation

The lecture material on the subject Engineering Physics - I is divided into the following sections: Kinematics and dynamics of a material point, Relativistic physics, Dynamics of a solid, Oscillations and waves, Dynamics of fluids, Fundamentals of thermodynamics and Fundamentals of molecular kinetic theory. The material is selected in accordance with the planned hours and the specifics of the specialty, and within a reasonable compromise between theoretical and applied material, priority is given to the technical and applied side of the topics.

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

The lectures are held in the sequence indicated in the curriculum. The lecture material is developed on Power point and is presented with a video projector. The practical exercises are conducted in a specialized laboratory of Physics at the Technical Faculty

Prerequisites

Basic knowledge of mathematics and physics is desirable.

Enrollment for training in the discipline

The course is mandatory and is studied by all students majoring in Information and Communication Technology.

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

COMPUTER GRAPHICS AND 3D TECHNOLOGIES

ECTS credits: 5	Semester: 1st
Evaluation: ongoing assessment	Hours per week: 2 lectures+1 laboratory exercises
Course type: lectures + laboratory exercises	Course status: Compulsory
	Degree course Computer Systems and Technologies

Lecturer: Prof. Gabriela Atanasova, PhD Eng. – 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.

Annotation

The course "Computer Graphics and 3D Technologies" introduces students to the fundamental principles, algorithms, and tools in computer graphics and 3D technologies. It covers topics such as 3D modeling, rendering, and visualization, with a special focus on using modern software platforms. The course includes hands-on work with 3D printers and additive manufacturing technologies such as FDM (Fused Deposition Modeling) and DLP (Digital Light Processing), guiding students through the entire process from 3D modeling to preparing and physically printing objects.

Purpose of the course:

The purpose of the course is to equip students with a solid understanding of computer graphics and 3D technologies, enabling them to design, visualize, and produce 3D content using modern software and hardware tools. It aims to develop both theoretical knowledge and practical skills in modeling, rendering, and 3D printing.

Educational Methods:

The course uses lectures, lab exercises, and project-based learning. Students learn theory through presentations and develop practical skills using modern software and hardware tools. Exercises on 3D printing and additive manufacturing provide hands-on experience.

MATHEMATICS FOR ENGINEERS - II

ECTS credits: 6	Semester: 2nd
Evaluation: written exam	Hours per week: 2 lectures + 2 exercises
Course type: lectures + exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

Lecturer: Associate Professor Vasil Grozdanov - vassgroz@swu.bg

Assistant: Assist. Prof. Yordanka Angelova - y.angelova@swu.bg

Department:

Faculty: Faculty of Engineering – technical@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.

Annotation

Main topics:

- Integral calculus of functions of a real variable - indefinite integral, basic integration techniques, definite integral, classes of integrable functions, properties of the definite integral,
- Functional rows and rows
- Differential calculus of multivariate functions - private derivatives of first and higher order, local and global extrema of multivariate functions
- Simple differential equations
- Integrated calculation of functions of several variables - double and triple integral, calculation, change of variables, geometric and physical applications
- Curvilinear integrals - definition, properties, calculation, approximations.

It is planned to get acquainted with software products that implement some of the considered methods.

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.

ELECTROTECHNICAL MATERIALS

ECTS credits: 5	Semester: 2 nd
Evaluation: written exam	Hours per week: 2 lectures+1 laboratory exercise
Course type: lectures + laboratory exercises	Course status: Compulsory
	Degree course Computer systems and technologies

Lecturer: Assoc. Prof. Dimitrina Kerina, PhD – d_kerina@swu.bg

Assistant: Chief Assist. Prof. Ilian Ivanov, PhD – ivanov@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.

Annotation

The lecture material on the subject Electrotechnical Materials is divided into the following sections: Physical Fundamentals of Electrical Materials Science, Non-Electrical Properties of Materials, Dielectrics, Conductive Materials, Semiconductor Materials, Magnetic Materials. The application in the electrical engineering of the passive elements resistors, capacitors and coils is considered

Purpose of the course

To acquaint students with the behavior and processes that occur in different types of electrical materials - dielectrics, conductors, semiconductor and magnetic materials, when placed in an electric, magnetic and thermal field and radiation.

Educational Methods

The lectures are held in the sequence indicated in the curriculum. The lecture material is developed on Power point and is presented with a video projector. The practical exercises are conducted in a specialized laboratory of Electrical and Nanomaterials of the Technical Faculty.

Prerequisites

Basic knowledge of mathematics and physics is desirable.

Enrollment for training in the discipline

The course is mandatory and is studied by all students majoring in Information and Communication Technology.

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

ELECTRICAL ENGINEERING

ECTS credits: 6	Semester: 2nd
Evaluation: written exam	Hours per week: 2 lectures +1 seminar exercise +1 laboratory exercise
Course type: lectures and laboratory exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

Lecturer Assoc. Prof. Nikolay Atanasov PhD Eng. – natanasov@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.

Assistant: Assoc. Prof. Ivan Nedyalkov PhD - i.nedqlkov@gmail.com
Department: "Communication and computer engineering" - technical_kktt@swu.bg
Faculty: Faculty of Engineering - technical@swu.bg
Address: 2700 Blagoevgrad, 66 Ivan Mihailov Str

Annotation

The content of the curriculum covers fundamental topics related to electric circuits, basic components, circuit analysis laws, sinusoidal and direct current operating modes in electric circuits, circuits with mutual inductance, complex circuits, linear transformers, and three-phase circuits.

Purpose of the course

The purpose of the course is to provide students with a solid foundation in the principles and analysis of electric circuits. It aims to develop an understanding of basic electrical components, the laws governing electric circuits, and the behavior of circuits under various operating conditions, including direct current (DC) and alternating current (AC) regimes. The course also introduces students to more advanced concepts such as mutual inductance, complex circuit configurations, linear transformers, and three-phase systems, preparing them for further study and practical applications in electrical engineering.

Educational Methods

The course employs a blend of teaching methods designed to enhance both theoretical knowledge and practical skills. These include interactive lectures, hands-on laboratory experiments, guided problem-solving sessions, and collaborative group work. Emphasis is placed on active student participation, critical thinking, and the application of concepts to real-world electrical engineering problems, ensuring a well-rounded and engaging learning experience.

Prerequisites

Knowledge of Engineering Mathematics I, Engineering Physics I is desirable.

Enrollment for training in the discipline

The course is mandatory and is studied by all students majoring in Information and Communication Technology.

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

FOREIGN LANGUAGE II

ECTS credits: 3	Semester: II
Evaluation: ongoing assessment	Hours per week: 2 seminar exercises
Course type: seminar exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

Lecturer: Assist. Prof. Bilyana Georgieva, PhD – 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.

Annotation:

The course "Foreign Language" aims to ensure the development of communicative skills, mastery of a certain phonetic, grammatical, lexical and thematic minimum, skills and habits for participation in real, communicative situations, knowledge and independent work with vocabulary. It aims to negotiate and systematize the basic knowledge of students and provides a unified starting level for the next stage of training, called "language of the specialty". The choice of topics is based on their high specificity in the scientific style of speech and their unconditional structural significance and necessity in the process of learning a foreign language. Exercises with communicative orientation are widely used, which strengthen the necessary grammatical habits and encourage students to active speech activity within the studied topics. The practical course is based on thematic texts reflecting the student's daily life, basic special technical terminology in the specialty and aims to stimulate the desire and motivation of students to improve their knowledge of a foreign language and corresponds to the level - Elementary and Pre-intermediate.

Purpose of the course:

The aim of the course is to build initial communicative competence, as the ability to understand and compose orally and in writing meaningful statements, in accordance with the rules of the English language, to develop skills for reading and comprehension of texts from everyday communication and presentation, as well as texts related with the main terms of the specialty; To develop skills for working with a technical dictionary, To be able to translate technical texts from English into Bulgarian with the help of a dictionary.

Educational Methods:

Active methods are used through exercises, tests for knowledge control are conducted, and solving of relevant practical classes, translation of technical literature is assigned.

Prerequisites:

Establishing the preliminary knowledge and skills of students in the discipline, their learning style, motives and interests in the discipline are an important factor in achieving the goals and objectives. The establishment of the entrance level of the students is done by means of a test for determining the level. Depending on the level of preliminary preparation shown, an

update of the content, volume and depth of the topics covered, as well as teaching methods is envisaged.

Enrollment for training in the discipline:

The course is studied by all students majoring in Computer systems and technologies, as it is mandatory.

Exam registration:

The enrollment for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the laboratory exercises and the training department.

PROGRAMMING AND DATA STRUCTURES

ECTS credits: 5	Semester: II
Evaluation: ongoing assessment	Hours per week: 2 Lectures + 1 laboratory exercises
Course type: lectures+ laboratory exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

Lecturer: Assoc. Prof. Fatima Sapundzhi, PhD – sapundzhi@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.

Annotation

The discipline „Programming and Data Structures“ is a compulsory course in the curriculum of the Computer Systems and Technologies, bachelor's degree program at the Faculty of Engineering, South-West University "Neofit Rilski", Blagoevgrad.

The course provides students with an introduction to the fundamental concepts of data structures and algorithms that form the foundation of computer science. Emphasis is placed on both the theoretical foundations and the practical application of these concepts through modern programming languages.

The course covers linear and nonlinear data structures, such as lists, queues, stacks, trees and graphs, as well as algorithms related to their processing - searching, sorting, traversal, optimization algorithms, etc. Special attention is paid to the analysis of algorithms and performance evaluation. Through laboratory exercises, students develop algorithmic thinking and the ability to apply their knowledge to solve problems in various fields, including software engineering, computer networks, systems programming and other areas of the IT sector.

Purpose of the course

The objective of the course Programming and Data Structures is to provide students with in-depth theoretical and practical knowledge of data structures and algorithms, which are fundamental to computer science and information and communication technologies (ICT). The course focuses on developing algorithmic thinking, modeling of abstract structures, and their application in designing and implementing efficient software solutions in diverse ICT areas such as system and application development, databases, computer networks, and artificial intelligence.

Educational Methods

The course is conducted through lectures and laboratory exercises, using interactive teaching methods consistent with modern standards for ICT education. During lectures, multimedia presentations are used to present information, which is illustrated with visual materials. Multimedia projector is used. Each lecture includes practical examples and tasks that are solved in real time, encouraging active dialogue and discussions throughout.

Laboratory exercises are held in a fully equipped computer room, where each student has access to an individual workstation with the necessary hardware and pre-installed software. At the end of each laboratory exercise, students

submit their solutions electronically through modern platforms for the exchange and assessment of educational content.

Prerequisites

Determining the students' prior knowledge and skills related to the course, as well as their learning style, motivation, and interests, is an important factor in achieving the course objectives. Various approaches are used to assess the students' entry level, including tests or short written reports. Course content, scope, depth, and teaching methods can be adapted according to the identified level of preparedness.

Enrollment for training in the discipline

The course is compulsory and is studied by all students enrolled in the Computer Systems and Technologies bachelor's degree program.

ELECTRICAL MEASUREMENTS

ECTS credits: 5	Semester: 2nd
Evaluation: written exam	Hours per week: 2 lectures +1 laboratory exercise
Course type: lectures + laboratory exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

Lecturer: Prof. Gabriela Atanasova PhD Eng. – atanasova@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.

Annotation

The training in the discipline includes the study of the basic concepts and definitions in electrical measuring equipment, as well as methods for measuring the basic physical quantities, power, energy, phase difference, frequency, parameters of bipolar poles and others.

Purpose of the course

The purpose of the course is to provide students with a solid foundation in the principles and techniques of electrical measurements. It aims to develop practical skills in using measurement instruments, understanding the nature of measurement errors and uncertainties, and applying proper methods for data collection and analysis in the context of electrical circuits. The course prepares students to perform accurate and reliable measurements, which are essential for both academic research and professional engineering practice.

Educational Methods

The course utilizes a blended learning approach, combining interactive lectures with practical laboratory work. Lectures are delivered using PowerPoint presentations enhanced by modern teaching tools, including multimedia systems, simulation software, and physical models. To reinforce theoretical knowledge, key concepts are visualized through demonstrations. Laboratory sessions offer hands-on experience, allowing students to perform real-time measurements and experiments, analyze data, and apply theoretical principles in a controlled environment. This integrated approach promotes active learning and the development of both technical and analytical skills.

Prerequisites

Knowledge of Engineering Mathematics I, Engineering Physics I, Electrical Engineering is desirable.

Enrollment for training in the discipline

The course is mandatory and is studied by all students majoring in Information and Communication Technology.

BASICS OF NETWORK TECHNOLOGIES

ECTS credits: 5	Semester: 3rd
Evaluation: written exam	Hours per week: 2 lectures +2 laboratory exercises
Course type: lectures + laboratory exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

Lecturer: Prof. Gabriela Atanasova PhD Eng. – atanasova@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.

Annotation

This course provides students with fundamental knowledge of modern network architectures, protocols, and technologies. Through a combination of lectures and hands-on exercises, students explore: Core principles of data transmission, including OSI and TCP/IP models, Local and wide area networks (LAN/WAN), addressing schemes, and routing fundamentals, Key network protocols and their applications, Wireless and wired communication technologies, network security basics

Purpose of the course

The course "Basics of Network Technologies" aims to provide students with a solid theoretical and practical foundation in modern networking. By the end of the course, students will be able to: Understand fundamental networking concepts and models (OSI, TCP/IP). Configure and analyze LAN/WAN environments. Apply core network protocols in real-world scenarios. This course serves as a critical stepping stone for careers in network engineering, cybersecurity, and connected systems development.

Educational Methods

The course utilizes a blended learning approach, combining interactive lectures with practical laboratory work. Lectures are delivered using PowerPoint presentations enhanced by modern teaching tools, including multimedia systems, simulation software, and physical models. To reinforce theoretical knowledge, key concepts are visualized through demonstrations. Laboratory sessions offer hands-on experience, allowing students to perform real-time measurements and experiments, analyze data, and apply theoretical principles in a controlled environment.

Prerequisites

Knowledge of Engineering Mathematics I, Engineering Mathematics II, Programming I is desirable.

Enrollment for training in the discipline:

The course is mandatory and is studied by all students majoring in Information and Communication Technology.

PROGRAMMING II

ECTS credits: 5	Semester: 3rd
Evaluation: written exam	Hours per week: 2 lectures +2 laboratory exercises
Course type: lectures +laboratory exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

Lecturer: Assoc. Prof. DSc Ivan Trenchev, E-mail: trenchev@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

Annotation

"Programming II" is a compulsory course aimed at expanding students' knowledge of the C++ programming language through the application of object-oriented programming (OOP) principles. Building upon the foundations laid in Programming I, the course introduces students to key OOP concepts such as encapsulation, inheritance, polymorphism, templates, exception handling, and file operations.

Special emphasis is placed on the relevance of C++ in the modern software industry, particularly in the development of interactive applications and computer games. The course offers an introduction to the architecture and core functionalities of Unreal Engine 5 (UE5) – a leading real-time game and simulation development platform based on C++. Through hands-on examples and projects, students gain insight into how C++ programming underpins game logic, object management, and interaction within virtual environments.

This course is suitable for students pursuing careers in software engineering, game design, or simulation technologies. It provides a balanced combination of theoretical knowledge and practical skills necessary for designing efficient and maintainable code in both industrial and creative contexts.

Purpose of the course

The aim of the Programming II course is to expand and deepen students' knowledge of the C++ programming language by mastering the concepts and techniques of object-oriented programming (OOP). Students will learn to develop structured, readable, and extensible software solutions through the use of classes, objects, inheritance, polymorphism, templates, file operations, and exception handling.

The course lays a foundation for real-world engineering and project-based work, emphasizing the practical application of C++ in areas such as software engineering, automation, as well as game development and interactive environments using Unreal Engine 5 (UE5) – a leading game engine based on C++.

The course aims to: build a solid theoretical and practical foundation in object-oriented programming; develop programming skills in the context of modern platforms, including UE5; foster logical thinking, algorithmic approaches, and the ability to create scalable software; prepare students for future careers in industries such as gaming, engineering simulations, embedded systems, and applied informatics.

Educational Methods

The course is held in lecture halls with students from KTT, KST and EEA. The exercises are conducted in groups, and usually the groups are composed of 10-15 students.

Prerequisites

Knowledge of Programming I is desirable.

Enrollment for training in the discipline

The course is mandatory and is studied by all students majoring in Information and Communication Technology.

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

ANALOGUE ELECTRONIC

ECTS credits: 5	Semester: 3rd
Evaluation: written exam	Hours per week: 2 lectures +2 laboratory exercises
Course type: lectures + laboratory exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

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.

Assistant: ch. Assist. Prof. Dr. E.Frenski - emil_f@swu.bg

Department: Communication and Computer Engineering – technical_kktt@swu.bg

Annotation

The training course includes basic issues related to analogue electronics sheets, parts and related connections between them.

Purpose of the course

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.

Prerequisites

Knowledge of Engineering Mathematics I, II, Theoretical Electrical Engineering I, Engineering Physics I, II, and Building Elements in Electronics is desirable.

Enrollment for training in the discipline

The course is mandatory and is studied by all students majoring in Information and Communication Technology.

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

INTRODUCTION TO CLOUD TECHNOLOGIES

ECTS credits: 6	Semester: 3rd
Evaluation: written exam	Hours per week: 2 lectures + 2 exercises
Course type: lectures + exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

Lecturer: Assoc. Prof. Fatima Sapundzhi, PhD – sapundzhi@swu.bg

Department: Communication and Computer Engineering – technical_kktt@swu.bg

and Assoc. Prof. Dr. Eng. Ivan Nedyalkov – i.nedqlkov@swu.bg

Faculty: Faculty of Engineering – technical@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.

Annotation

The course "Introduction to Cloud Technologies" is offered as a compulsory within the curriculum of the "Intelligent business systems and logistics" bachelor's degree program at the Faculty of Engineering of South-West University "Neofit Rilski" in Blagoevgrad.

The course covers issues related to the fundamentals and principles of cloud computing, cloud architectures, service delivery models, virtualization, resource management, security and data protection in the cloud, as well as practical aspects of using leading cloud platforms. Technologies for automation and scaling of applications in the cloud environment are considered, as well as their integration into business processes and logistics systems.

Purpose of the course

The objective of the course is for students to acquire modern knowledge, practical skills and competencies in the field of cloud technologies, necessary for the development, implementation and maintenance of modern information systems. Students will become familiar with architectural approaches, tools and platforms used in real business and logistics environments, as well as with good practices for security and management of cloud services.

Educational Methods:

The course is taught in a lecture and computer room using modern interactive methods, in line with current requirements in the field of Computer systems and technologies. Lectures are accompanied by multimedia presentations and are visualized via a multimedia projector, including demonstrations, practical examples and active discussions with students.

Practical classes are held in a specialized computer laboratory equipped with modern hardware and software tools, including access to cloud platforms such as Microsoft Azure, Amazon Web Services (AWS), Google Cloud Platform (GCP) and others. During practical classes, students work on individual and team projects, through which they apply the learned theoretical knowledge in real cases and simulated business environments. The training encourages independent work, critical thinking and the development of practical skills necessary for professional realization in the field of cloud technologies.

Prerequisites

Determining the students' prior knowledge and skills related to the course, as well as their learning style, motivation, and interests, is an important factor in achieving the course objectives. Various approaches are used to assess the students' entry level, including tests or short written reports. Course content, scope, depth, and teaching methods can be adapted according to the identified level of preparedness.

TECHNOLOGICAL PRACTICE I: CONSTRUCTING ELEMENTS

ECTS credits: 3	Semester: 3rd
Evaluation: on going assessment	Hours per week: 3 laboratory exercises
Course type: laboratory exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

Lecturer: Assist. Prof. Dinko Stoykov, PhD - dinkostoikov@swu.bg

Assistant: Assist. Prof. Dinko Stoykov, PhD - dinkostoikov@swu.bg

Department: "Electrical Engineering, Electronics and Automation" - technical_eea@swu.bg

Faculty: Technical Faculty - technical@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mikhailov Street;

Annotation

The study material is prepared on the basis of students' knowledge acquired in general technical and special disciplines for the specialty. The main sections and topics are selected and arranged in such a way as to correspond as much as possible with the acquired theoretical knowledge and to help build professional skills and habits. The study of the course will allow students to deepen their understanding and knowledge, to gain practical experience, skills and habits to perform basic electrical operations related to the production and operation of various types of electronic and communication equipment. The material is selected in accordance with the planned hours and the specifics of the specialty, giving priority to the technical and applied side of the topics.

Purpose of the course

The main goal of the course is for future specialists in Computer systems and technologies to acquire knowledge, skills, habits and experience in the technology of production and operation of elements, assemblies and units of different types of electronic equipment. To acquire skills for working with reference technical literature, to develop technical and technological documentation.

Educational Methods

The training is conducted in a specialized laboratory, equipped with the necessary tools and measuring equipment. Auxiliary diagrams, drawings, technical and technological documentation, materials and consumables are prepared in advance for exercise. The laboratory has adapted PC technology for the production of small series of printed circuit boards.

Prerequisites

Knowledge of Theoretical Electrical Engineering, Engineering Physics, Analog Electronics is desirable. Building blocks in electronics.

Enrollment for training in the discipline

The course is mandatory and is studied by all students majoring in Information and Communication Technology.

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

SIGNALS AND SYSTEMS

ECTS credits: 5	Semester: 3rd
Evaluation: written exam	Hours per week: 2 lectures +1 laboratory exercises
Course type: lectures + laboratory exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

Lecturer: Assoc. Prof. Dr. Ivan Nedyalkov

Department: Communication and Computer Engineering – technical_kktt@swu.bg

Faculty: Faculty of Engineering – technical@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.

Annotation

The Signals and Systems course provides fundamental knowledge of continuous and discrete signals and systems in both the time and frequency domains. Students gain an understanding of spectral analysis for periodic and aperiodic signals, types of spectra, and their key characteristics. The course covers essential topics such as signal modulation, various amplitude modulation techniques, and their impact on bandwidth and communication system throughput. It also includes the conversion of analog signals to digital form, types of digital filters, principles of optimal linear filtering, and noise-resilient signal coding.

Purpose of the course

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

Prerequisites

Knowledge of Engineering Mathematics I, II, III, Analog Electronics is desirable.

Enrollment for training in the discipline

The course is mandatory and is studied by all students majoring in Information and Communication Technology.

DIGITAL ELECTRONIC

ECTS credits: 6	Semester: 4th
Evaluation: written exam	Hours per week: 2 lectures +2 laboratory exercises
Course type: lectures + laboratory exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

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.

Assistant: Assist. Prof., Eng. Emil Frenski – emil_f@swu.bg

Department: Communication and Computer Engineering – technical_kktt@swu.bg

Annotation

The training course includes basic issues related to digital electronics sheets, parts and related connections between them.

Purpose of the course

The aim of the course is for students to acquire the necessary minimum theoretical and applied knowledge of the principles of operation and design of the most common digital electronic circuits and modules used and applied by the most famous suppliers of such equipment in the world.

Educational Methods

Active methods are used through laboratory exercises in a laboratory equipped with the necessary equipment and models, tests for knowledge control are conducted, and the solution of relevant practical classes is assigned, discussions and presentations of Power Point papers are made.

Prerequisites

Knowledge of Engineering Mathematics I, II, III, Analog Electronics is desirable.

Enrollment for training in the discipline

The course is mandatory and is studied by all students majoring in Information and Communication Technology.

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

POWER CONVERSION TECHNIQUES AND POWER SUPPLIES

ECTS credits: 5	Semester: 4th
Evaluation: written exam	Hours per week: 2Lect.+0S+2Lab.
Course type: lectures + laboratory exercises	Course status: Compulsory
	Degree course: Information and communication technologies

Lecturer: Ch. Assist. Prof. Ivo Angelov, PhD – ivo.angelov@swu.bg

Assistant: Ch. 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

Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.

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.

Purpose of the course

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.

Prerequisites

Knowledge of Engineering Mathematics I, Analog Electronics, Engineering Physics, Building Elements in Electronics is desirable.

Enrollment for training in the discipline

The course is mandatory and is studied by all students majoring in Information and Communication Technology.

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

FUNDAMENTALS OF CYBER SECURITY

ECTS credits: 4	Semester: 4th
Evaluation: exam	Hours per week: 2Lect. +0S+2Lab.
Course type: lectures + laboratory exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

Lecturer: Chief. assist. Georgi Georgiev, PhD Eng. – g.georgiev@swu.bg

Assistant: Chief. assist. Iliyan Ivanov, PhD Eng. – ivanov@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.

Annotation

Fundamentals of Cybersecurity is a mandatory course for students majoring in “Computer Systems and Technologies” at the Faculty of Engineering of the Southwest University “Neofit Rilski” for the educational and qualification degree “Bachelor”. The content of the curriculum covers basic issues related to cyberterrorism, cyber attacks and cyber defense. Issues related to legal norms, regulation and standards in cybersecurity are also considered. The course is designed to provide advanced knowledge in the field of cybersecurity, data coding, data encryption using cryptographic algorithms, cryptanalysis of algorithms for information protection.

Purpose of the course

The aim of the course is for students to gain the necessary theoretical and applied knowledge in cybersecurity, as well as skills for quantitative assessment of security risk. Students will be able to gain the necessary theoretical and applied knowledge in cryptography, as well as skills to perform various methods of attack, and on the other hand, for prevention on cloud computing resources and networks representing the Internet of Things technology. They acquire skills for working and selecting tools, finding databases on the network and cracking database passwords.

Educational Methods

Lectures, talks, discussions, practical testing of the work of the systems under consideration on examples, coursework.

Prerequisites

Determining the students' prior knowledge and skills in the subject, their learning style, motives and interests in the subject is an important factor in achieving the set goals and objectives. To clarify these features, various approaches are envisaged for establishing the students' entry level, such as: conducting an oral discussion, tests, surveys or reports from the students.

Enrollment for training in the discipline

Mandatory subject from the curriculum of the specialty "Computer Systems and Technologies", Bachelor's degree.

Exam registration

The registration for the comprehensive current assessment is coordinated with the course instructor, the laboratory instructor, and the academic department.

COMPUTER ARCHITECTURES

ECTS credits: 6	Semester: 4th
Evaluation: written exam	Hours per week: 2Lect.+0S+2Lab.
Course type: lectures + laboratory exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

Lecturer: Assoc. Prof., Eng. Ludmila Taneva, PhD – lucy_t@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.

Assistant: Assist. Pavel Djunev – djunev@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.

Annotation

The discipline "Computer Architectures" is part of the curriculum and includes topics from computer architecture. As a form of control, current control and examination are provided. The subject of the discipline are modern single-processor and multiprocessor computer systems. The course aims to build knowledge of architectures for parallel processing at different levels and to create skills in their software. Computer architectures are presented in the context of methods for ensuring parallel execution of instructions, threads, processes and tasks in different topologies, connections and memory organization and within common models for parallel programming. The planned laboratory workshop focuses on the hardware-software interface in computer architectures. It deepens the knowledge of programming and management of system resources.

Purpose of the course

The aim of the course "Computer Architectures" is to build knowledge of architectures for parallel processing and to create skills in their software. To study methods for addressing, segmenting and protecting memory, mechanisms for handling exceptions and interrupts, architectural support for servicing the memory hierarchy, parallel execution of instructions, types of processed data, parallel computer architectures and models for parallel programming, performance and efficiency of parallel computer architectures, planning and management of memory, processes and loads in parallel computer architectures.

Educational Methods

The lectures are conducted in the classical way and the students get acquainted sequentially with the provided material. The practical exercises are conducted in a laboratory of the department, equipped with the necessary PC and training simulators / emulators. After each topic of the study material provided for the exercises, students prepare a protocol containing the purpose and tasks that are set, experimental data that were obtained during the exercise and the relevant conclusions about the problem.

Prerequisites

Establishing the preliminary knowledge and skills of students in the discipline, their learning style, motives and interests in the discipline is an

important factor in achieving the goals and objectives. To clarify these features, different approaches are provided for establishing the entry level of students, such as: conducting oral talks, test questionnaires or reports from students. Depending on the level of preliminary preparation shown, an update of the content, volume and depth of the topics covered, as well as teaching methods is envisaged.

Enrollment for training in the discipline

The course is mandatory and is studied by all students majoring in Computer systems and technologies.

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

PROGRAMMING WITH PYTHON

ECTS credits: 4	Semester: 3rd
Evaluation: written exam	Hours per week: 2 lectures +2 laboratory exercises
Course type: lectures + laboratory exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

Lecturer: Assoc. Prof. Nikolay Atanasov PhD Eng. – ntanasov@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.

Annotation

Programming with Python is a compulsory course for students covers essential topics related to virtual machines – their creation, advantages, and disadvantages. It includes an introduction to the Python programming language – installation and setup, running Python code, and fundamental programming concepts such as variables, data input, functions, conditionals, and loops. Additional topics include data structures, file input/output operations, and the development of graphical user interfaces (GUIs).

Purpose of the course

The purpose of the course is to equip students with fundamental and advanced programming skills using the Python programming language. It aims to develop the ability to design, write, and debug Python programs, as well as to apply programming concepts to solve real-world problems. By the end of the course, students will be able to work with data structures, perform file operations, and create graphical user interfaces, laying a strong foundation for further studies and professional development in software development and related fields.

Educational Methods

The course is delivered through a combination of lectures, hands-on laboratory sessions, coding exercises, and project-based learning. Students actively participate in solving practical programming tasks, both individually and in groups. The use of interactive tools and real-world examples helps reinforce theoretical concepts and develop practical coding skills. Continuous assessment through assignments and projects ensures effective learning and application of the Python programming language.

Prerequisites

Basic knowledge of computer systems and general computer literacy are required. Familiarity with fundamental concepts in mathematics and logic will be beneficial. No prior programming experience is necessary, as the course is designed to introduce students to programming from the ground up.

FOREIGN LANGUAGE III

ECTS credits: 4	Semester: V
Evaluation: ongoing assessment	Hours per week: 3 seminar exercises
Course type: seminar exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

Lecturer: Assist. Prof. Bilyana Georgieva, PhD – 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.

Annotation

The course "Foreign Language" aims to ensure the development of communicative skills, mastery of a certain phonetic, grammatical, lexical and thematic minimum, skills and habits for participation in real, communicative situations, knowledge and independent work with vocabulary. It aims to negotiate and systematize the basic knowledge of students and provides a unified starting level for the next stage of training, called "language of the specialty". The choice of topics is based on their high specificity in the scientific style of speech and their unconditional structural significance and necessity in the process of learning a foreign language. Exercises with communicative orientation are widely used, which strengthen the necessary grammatical habits and encourage students to active speech activity within the studied topics. The practical course is based on thematic texts reflecting the student's daily life, basic special technical terminology in the specialty and aims to stimulate the desire and motivation of students to improve their knowledge of a foreign language and corresponds to the level - Elementary and Pre-intermediate.

Purpose of the course

The aim of the course is to build initial communicative competence, as the ability to understand and compose orally and in writing meaningful statements, in accordance with the rules of the English language, to develop skills for reading and comprehension of texts from everyday communication and presentation, as well as texts related with the main terms of the specialty; To develop skills for working with a technical dictionary, To be able to translate technical texts from English into Bulgarian with the help of a dictionary.

Educational Methods

Active methods are used through exercises, tests for knowledge control are conducted, and solving of relevant practical classes, translation of technical literature is assigned.

Prerequisites

Establishing the preliminary knowledge and skills of students in the discipline, their learning style, motives and interests in the discipline are an important factor in achieving the goals and objectives. The establishment of the entrance level of the students is done by means of a test for determining the level. Depending on the level of preliminary preparation shown, an

update of the content, volume and depth of the topics covered, as well as teaching methods is envisaged.

Enrollment for training in the discipline

The course is studied by all students majoring in Computer systems and technologies, as it is mandatory.

Exam registration

The enrollment for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the laboratory exercises and the training department.

SYNTHESIS AND ANALYSIS OF ALGORITHMS

ECTS credits: 6	Semester: V
Evaluation: written exam	Hours per week: 2 Lectures +1 Laboratorie
Course type: lectures + laboratory exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

Lecturer: Assoc. Prof. Velin Kralev, PhD – velin_kralev@swu.bg

Department: Informatics – informatics@swu.bg

Faculty: Mathematics and Natural Sciences – pmf@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.

Annotation

The course introduces students to the basic elements of algorithm theory and their complexity. Special attention is paid to the issue of analysis of algorithms concerning their various aspects. The considered algorithms for different classes of tasks allow students to do the next step: to construct (synthesize) new algorithms for specific tasks assigned to them.

Purpose of the course

The goal of the studied topic is for students to acquire theoretical knowledge and practical experience in the analysis and synthesis of algorithms. The main task is for the student to be able to design and analyze more complex algorithms based on those discussed in the course.

Educational Methods

Lectures, talks, discussions, exercises, and extracurricular activities

Prerequisites

Establishing the preliminary knowledge and skills of students in the discipline, their learning style, motives and interests in the discipline is an important factor in achieving the goals and objectives. To clarify these features, different approaches are provided for establishing the entry level of students, such as: conducting oral talks, test questionnaires or reports from students. Depending on the level of preliminary preparation shown, an update of the content, volume and depth of the topics covered, as well as teaching methods is envisaged.

Enrollment for training in the discipline

The course is mandatory and is studied by all students majoring in Computer systems and technologies.

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

COMPUTER PERIPHERALS AND INTERFACES

ECTS credits: 6	Semester: V
Evaluation: written exam	Hours per week: 2 Lectures + 2 Laboratories
Course type: lectures + laboratory exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

Lecturer: Assoc. Prof., Eng. Ludmila Taneva, PhD – lucy_t@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.

Assistant: Assoc. Prof., Eng. Ludmila Taneva, PhD – lucy_t@swu.bg

Annotation

The training in the discipline includes: the place and the role of the peripheral devices in the modern computer systems; the types of information carriers; methods of writing and reading from different media; questions from the theory of noise-resistant coding of information. Keyboards and screens, impact and non-impact printers, as well as various external storage devices on magnetic and optical media are also considered. The basic concepts and results in the processing of speech information are given.

Purpose of the course

The aim of the course is to give students the necessary knowledge and skills to design and service modern peripherals in computer systems.

Educational Methods

The lectures are conducted in the classical way and the students get acquainted sequentially with the provided material.

Prerequisites

Establishing the preliminary knowledge and skills of students in the discipline, their learning style, motives and interests in the discipline is an important factor in achieving the goals and objectives. To clarify these features, different approaches are provided for establishing the entry level of students, such as: conducting oral talks, test questionnaires or reports from students. Depending on the level of preliminary preparation shown, an update of the content, volume and depth of the topics covered, as well as teaching methods is envisaged.

Enrollment for training in the discipline

The course is mandatory and is studied by all students majoring in Computer systems and technologies.

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

DATABASES

ECTS credits: 6	Semester: VI
Evaluation: exam	Hours per week: 2 Lectures +2 Laboratories
Course type: lectures + laboratory exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

Lecturer: Assoc. Prof. Velin Kralev, PhD – velin_kralev@swu.bg

Department: Informatics – informatics@swu.bg

Faculty: Mathematics and Natural Sciences – pmf@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.

Annotation

The proposed curriculum addresses key issues in the theory of "Databases" such as:

1. Conceptual model of the databases includes the main tasks that solve the problems set by the contracting authority;
2. Logical model of the database includes the logical connections between the different data, which are the basis of the developed database;
3. Physical model of the databases presents their physical realization (location, connections and information management);

The course examines the three main models of data presentation encountered in practice: hierarchically; network; relational.

In conclusion, some of the main ideas underlying the theory of distributed databases are considered.

Purpose of the course

The aim of the studied topic is for students to acquire theoretical knowledge and practical experience in building databases. The main task is for the student to be able to build databases under conditions formulated by the assignor. Expected results. The student should be able to build not very complex databases that are within the power of one person.

Educational Methods

Lectures, talks, discussions, exercises, extracurricular activities

Prerequisites

Establishing the preliminary knowledge and skills of students in the discipline, their learning style, motives and interests in the discipline is an important factor in achieving the goals and objectives. To clarify these features, different approaches are provided for establishing the entry level of students, such as: conducting oral talks, test questionnaires or reports from students. Depending on the level of preliminary preparation shown, an update of the content, volume and depth of the topics covered, as well as teaching methods is envisaged.

Enrollment for training in the discipline

The course is mandatory and is studied by all students majoring in Computer systems and technologies.

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

MICROPROCESSOR TECHNOLOGY

ECTS credits: 6	Semester: VI
Evaluation: written exam	Hours per week: 2 Lectures + 2 Laboratories
Course type: lectures + laboratory exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

Lecturer: Assoc. Prof., Eng. Ludmila Taneva, PhD – lucy_t@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.

Assistant: Assist. Pavel Djunev – djunev@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.

Annotation

The discipline includes 10 summarized topics. As a form of control, current control and examination are provided. The proposed study studies the characteristics, operation, organization and use of microcontrollers. The program model of various microcontrollers, types of addresses and instructions, peripheral modules, organization of the microprocessor systems, the internal circuit interfaces and the interfaces between the separate microprocessor systems are considered. Part of the lecture material concerns the problems in the design, setup and testing of microcomputer systems.

Purpose of the course

The aim of the course "Microprocessor Engineering" is for students to study the basic principles of operation and organization of microcontrollers, to work with various integrated environments for software development for microcontrollers, to program microcontrollers, to test and configure them, to design microprocessor systems.

Educational Methods

The lectures are conducted in the classical way and the students get acquainted sequentially with the provided material. It is planned to work with real microprocessor systems and make specific software decisions. The practical exercises are conducted in the laboratory of the department, equipped with the necessary training models with microcontrollers. After each topic of the study material provided for the exercises, students prepare a protocol containing the purpose and tasks that are set, experimental data that were obtained during the exercise and the relevant conclusions about the problem.

Prerequisites

Establishing the preliminary knowledge and skills of students in the discipline, their learning style, motives and interests in the discipline is an important factor in achieving the goals and objectives. To clarify these features, different approaches are provided for establishing the entry level of students, such as: conducting oral talks, test questionnaires or reports from students. Depending on the level of preliminary preparation shown, an update of the content, volume and depth of the topics covered, as well as teaching methods is envisaged.

Enrollment for training in the discipline

The course is mandatory and is studied by all students majoring in Computer systems and technologies.

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

OPERATION SYSTEMS

ECTS credits: 6	Semester: VI
Evaluation: ongoing assessment	Hours per week: 2 Lectures +2 Laboratories
Course type: lectures + laboratory exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

Lecturer: Assoc. Prof. Radoslav Mavrevski, PhD – mavrevski@swu.bg

Assistant: Assoc. Prof. Radoslav Mavrevski, PhD – mavrevski@swu.bg

Department: Informatics – informatics@swu.bg

Faculty: Mathematics and Natural Sciences – pmf@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.

Annotation

The course introduces students to the history, construction and operation of operating systems. The study material includes an introductory part - an overview of computer and operating systems. The following are questions of organization and management of processes, memory operation, scheduling of one and many processors. Topics for input and output organization, disk planning, organization and work with the file system for a mandatory part of each operating system course. Ends with distributed processes and security. The exercises study the Linux and Windows operating systems and illustrate the lecture topics. C programs are also made for process management and file system operation.

Purpose of the course

Upon completion of the course, students should be able to:

- Know: the basic principles of the work of the General Assembly.
- Can: perform basic administrative activities with the General Assembly.

Educational Method

Lectures, talks, discussions, exercises

Prerequisites

Establishing the preliminary knowledge and skills of students in the discipline, their learning style, motives and interests in the discipline is an important factor in achieving the goals and objectives. To clarify these features, different approaches are provided for establishing the entry level of students, such as: conducting oral talks, test questionnaires or reports from students. Depending on the level of preliminary preparation shown, an update of the content, volume and depth of the topics covered, as well as teaching methods is envisaged.

Enrollment for training in the discipline

The course is mandatory and is studied by all students majoring in Computer systems and technologies

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

SENSORS AND SENSOR NETWORKS

ECTS credits: 6	Semester: VII
Form for checking knowledge: written exam	Weekly horarium: 2 lectures. +2 lab. exercises
Course type: lectures and laboratory exercises	Status of the discipline: Mandatory
	Specialty: Computer systems and technologies

Lecturer: Chief Assistant Professor, Eng. Filip Tsvetanov PhD
ftsvetanov@swu.bg

Department: „Communication and computer technique and technology“
– technical_kktt@swu.bg

Faculty: Faculty of Engineering – technical@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mihaylov Street

Course description

The "Sensors and Sensor Networks" course covers the main issues related to the characteristics, constructions, and operating principles of conventional and smart sensors, the design and construction of sensor networks, and the transmission and monitoring of sensor data in the cloud.

Course Objective

The course "Sensors and Sensor Networks" aims for students to obtain, in a systematized form, basic knowledge about the physical nature and structure of sensors, the principles of operation, signal processing, the construction of intelligent sensors, and sensor networks. To become familiar with the areas of application, sensor interfaces, and criteria for their selection, to acquire skills for their integration into electronic systems for management and control of technological processes, as well as in the construction of sensor networks for monitoring and controlling various industrial processes.

Teaching methods

The training is conducted using modern interactive methods, encouraging active participation and application of knowledge in practical conditions. The lecture material is supplemented with laboratory exercises using specialized equipment, computers, microcontrollers, and simulation software products. Emphasis is placed on the practical mastery of the content through project work, simulations, and solving cases related to real engineering tasks.

Pre-conditions

For effective mastery of the course content, it is recommended that students have basic knowledge of physics, electrical engineering, analog and digital electronics, and electronic components. Knowledge of signals and systems, data transmission, programming, and measurement technologies will contribute to a deeper understanding of the principles of operation of sensors and sensor networks.

Enrollment for training in the discipline

The course is mandatory for all students of the specialty "Computer Systems and Technologies", Educational qualification "Bachelors"; no prior registration is required.

Exam registration

All students who have been certified for the semester by the student department and have collected the necessary credits from the current control in the discipline are allowed to take the exam.

INTERNET TECHNOLOGIES

ECTS credits: 6	Semester: VII
Evaluation: written exam	Hours per week : 1 Lectures + 2 Laboratories
Course type: lectures + laboratory exercises	Course status : Compulsory
	Degree course: Computer systems and technologies

Lecturer: Assoc. Prof. Fatima Sapundzhi, PhD – sapundzhi@swu.bg

Assistant: Assoc. Prof. Fatima Sapundzhi, PhD – sapundzhi@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.

Annotation

The Internet Technology course is designed to provide students with knowledge of the architecture of the Internet and World Wide Web technologies and their application for solving physical problems, as well as some of the basic network-forming technologies. Special attention is paid to Internet programming. The basic principles of programming with HTML and some software packages for creating WEB - sites (Front Page, etc.) are considered. Information is provided on the use of Java and Java Script in Internet programming and the use of a database in Internet applications. The exercises provided in the program aim to further develop the knowledge and create practical skills for using the visual programming languages in solving specific tasks. In addition, students will acquire habits for working on the Internet, including creating simple applications.

Purpose of the course

The course "Internet Technologies" aims to introduce students to the architecture of the Internet, World Wide Web technologies and the principles of developing software applications with modern software environments. They must be able to freely use object-oriented program modules to embed in program applications. Students must learn to develop Web pages and sites and publish materials on the Internet.

Educational Methods

Computers, a multimedia projector and an LCD panel, demonstration software, visual aids, boards and diagrams are used to illustrate the lecture material. The practical exercises are conducted in the computer laboratories of the departments of Communication and Computer Engineering and Technology and Informatics, equipped with the necessary computer configurations and demonstration software. Based on the material covered in the exercises, students develop homework, which must then be defended.

Prerequisites

Establishing the preliminary knowledge and skills of students in the discipline, their learning style, motives and interests in the discipline is an important factor in achieving the goals and objectives. To clarify these features, different approaches are provided for establishing the entry level of students, such as: conducting oral talks, test questionnaires or reports from students. Depending on the level of preliminary preparation shown, an update of the content, volume and depth of the topics covered, as well as teaching methods is envisaged.

Enrollment for training in the discipline

The course is mandatory and is studied by all students majoring in Computer Systems and Technologies.

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

APPLICATIONS FOR MOBILE OPERATING SYSTEMS

ECTS credits: 6	Semester: VII
Evaluation: written exam	Hours per week: 1 Lectures + 2 Laboratories
Course type: lectures + laboratory exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

Lecturer: Assoc. Prof. Fatima Sapundzhi, PhD – sapundzhi@swu.bg

Assistant: Assoc. Prof. Fatima Sapundzhi, PhD – sapundzhi@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.

Annotation

The course is designed to give students knowledge of some of the basic tools and principles for creating desktop and WEB applications for mobile operating systems, as well as some technologies for creating dynamic WEB applications. Particular attention is paid to the work and technology for developing applications with the Android operating system.

Purpose of the course

The aim of the course is for students to get acquainted with the principles of developing software applications with modern programming environments. They must be able to freely use objects and program modules to embed in software applications. Students must learn to develop mobile applications and Web pages and publish materials on the Internet.

Educational Methods

Computers, a multimedia projector and an LCD panel, demonstration software, visual aids, boards and diagrams are used to illustrate the lecture material. The practical exercises are conducted in the computer laboratories of the departments of Communication and Computer Engineering and Technology and Informatics, equipped with the necessary computer configurations and demonstration software. Based on the material covered in the exercises, students develop homework, which must then be defended.

Prerequisites

Establishing the preliminary knowledge and skills of students in the discipline, their learning style, motives and interests in the discipline is an important factor in achieving the goals and objectives. To clarify these features, different approaches are provided for establishing the entry level of students, such as: conducting oral talks, test questionnaires or reports from students. Depending on the level of preliminary preparation shown, an update of the content, volume and depth of the topics covered, as well as teaching methods is envisaged.

Enrollment for training in the discipline

The course is mandatory and is studied by all students majoring in Computer systems and technologies

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

COMPUTER NETWORKS I

ECTS credits: 6	Semester: VII
Evaluation: written exam	Hours per week: 2 Lectures +2 Laboratories
Course type: lectures + laboratory exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

Lecturer: Ch. Assist. Filip Tzvetanov, PhD – ftsvetanov@swu.bg

Assistant: Ch. Assist. Prof. Filip Tzvetanov, 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.

Annotation

The study material studies the basics of computer networks and the Internet: architecture of computer networks; methods for access to the communication environment and realizations of local networks; global network protocols; routing protocols; architecture and basic network services on the Internet.

Purpose of the course

The aim of this course is for students to gain the necessary knowledge and skills to design, build and administer local and global computer networks.

Educational Methods

The course is held in lecture halls. The exercises are conducted in subgroups, in computer rooms.

Prerequisites

Establishing the preliminary knowledge and skills of students in the discipline, their learning style, motives and interests in the discipline is an important factor in achieving the goals and objectives. To clarify these features, different approaches are provided for establishing the entry level of students, such as: conducting oral talks, test questionnaires or reports from students. Depending on the level of preliminary preparation shown, an update of the content, volume and depth of the topics covered, as well as teaching methods is envisaged.

Enrollment for training in the discipline

The course is mandatory and is studied by all students majoring in Computer systems and technologies.

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

TECHNOLOGICAL PRACTICE III: RELIABILITY AND DIAGNOSTICS OF COMPUTERS

ECTS credits: 6	Semester: VII
Evaluation: ongoing assessment	Hours per week: 2 Laboratories
Course type: laboratory exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

Lecturer: Assist. Eng Dinko Stoikov – dinkostojkov@swu.bg

Assistant: Assist. Eng Dinko Stoikov – dinkostojkov@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.

Annotation

The study material on the course Technological Practice III: "Reliability and diagnostics of computers" is divided into two parts: the first refers to block diagrams of computer systems and determining the type of failure; the second - to the set of different software and hardware methods for detection and elimination of faults in computer systems. The material is selected in accordance with the planned hours and the specifics of the specialty. The course has input links with the following disciplines: Engineering Physics I and II, Building Elements in Electronics, Workshop I, Electrical Engineering, Electrical Measurements and others. The output connections are with the disciplines: Analog Electronics, Digital Electronics, Conversion Technology and Power Supply, etc.

Purpose of the course

The purpose of this workshop is to be able to perform diagnostics and basic repairs of individual units (power supply, memory, disk systems, main board, etc.) of computer systems. Be able to use special software to detect problems and predict possible problems.

Educational Methods

Exercises are conducted in accordance with the curriculum. At the beginning of each lesson there is an instruction and, if necessary, a demonstration. The individual practical tasks are specified. Demonstrations on all topics are planned. The practical exercises are conducted in a specialized laboratory of the Technical Faculty.

Prerequisites

Establishing the preliminary knowledge and skills of students in the discipline, their learning style, motives and interests in the discipline is an important factor in achieving the goals and objectives. To clarify these features, different approaches are provided for establishing the entry level of students, such as: conducting oral talks, test questionnaires or reports from students. Depending on the level of preliminary preparation shown, an update of the content, volume and depth of the topics covered, as well as teaching methods is envisaged.

Enrollment for training in the discipline The course is mandatory and is studied by all students majoring in Computer systems and technologies.

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

NETWORK AND INFORMATION SECURITY

ECTS credits: 4	Semester: VII
Form for checking knowledge: current evaluation	Weekly horarium: 2 lectures. +1 lab. exercises
Course type: lectures and laboratory exercises	Status of the discipline: Mandatory
	Specialty: Computer systems and technologies

Lecturer: Chief Assistant Professor, Eng. Filip Tsvetanov PhD
ftsvetanov@swu.bg

Department: „Communication and computer technique and technology“
– technical_kktt@swu.bg

Faculty: Faculty of Engineering – technical@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mihaylov Street

Phone. +359 73 88 51 62

Course description

The course "Network and Information Security" introduces students to the principles and methodology for designing, building, and managing security and monitoring systems for various purposes. The emphasis is on the components of these systems, the criteria for their selection, and good practices for their integration into various technological environments. Mastering the theoretical foundation creates a basis for practical work on the analysis, evaluation, and design of solutions for protecting information and network resources.

Course Objective

The course "Network and Information Security" aims to prepare students with comprehensive knowledge and practical skills for designing, implementing, and managing network and information security systems. The training covers a number of essential aspects such as: regulatory framework and standards in the field of cybersecurity, architecture of computer and communication systems, and the interaction between network levels, technologies and protocols for secure data transmission, processing and storage, as well as threat analysis, types of cyber attacks (DoS, phishing, malware, MITM, etc.) and ways to implement them. Methods and tools for protection - cryptographic systems, digital certificates, firewalls, intrusion detection and prevention systems (IDS/IPS), multi-factor authentication (MFA), VPN technologies, etc.. Implement modern solutions for monitoring and responding to incidents through security and event management platforms (SIEM)—strategies for notification, automated response, and continuous security improvement in the network environment.

Through theoretical knowledge and practical exercises, the discipline builds students' competence to work in a real and dynamic cyber environment.

Teaching methods

The training is conducted using modern interactive methods, encouraging active participation and application of knowledge in practical conditions. The lecture material is supplemented with laboratory exercises using specialized equipment, computers, microcontrollers, and simulation software products. Emphasis is placed on the practical mastery of the content through project work, simulations, and solving cases related to real engineering tasks.

Pre-conditions

Establishing the students' prior knowledge and skills in the subject, their learning style, motives, and interests in the subject, is an important factor in achieving the goals and objectives. To clarify these features, various approaches are envisaged for establishing the students' entry level, such as conducting oral discussions, test questionnaires, or student reports. Depending on the demonstrated level of prior preparation, an update of the content, volume, and depth of the topics covered and teaching methods is envisaged.

Enrollment for training in the discipline

The course is mandatory for all students of the specialty "Computer Systems and Technologies", Educational qualification "Bachelors", no prior registration is required.

Exam registration

The discipline ends with a current grade, which is formed as a result of the current control at the end of the semester. Students who have not met the requirements for forming a current grade are allowed to take a remedial exam after fulfilling all the obligations under the current control of the discipline.

SIMULATION PROGRAMS IN COMPUTER TECHNOLOGY

ECTS credits: 6	Semester: V
Evaluation: exam	Hours per week: 1 Lecture + 2 Laboratories
Course type: lectures + laboratory exercises	Course status: Elective
	Degree course: Computer Systems and Technologies

Assoc. Prof. Nikolay Atanasov PhD Eng. – natanasov@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.

Annotation

The subject Simulation Programs in Computer Technology presents students opportunity to understand and explore the opportunities of computational electrodynamics. Using computational electrodynamics, students can simulate, investigate, and design current distribution on conductive surfaces, spatial distribution of the electric and magnetic field, absorbed power in the human body (SAR – specific absorption rate), electric circuits, antennas, radiowave propagation, and microwave devices. The students investigate the influence of the initial (boundary) conditions on the final results and figures. 3D designs will be created inside the simulation environment or imported as CAD files from a third-party application.

Purpose of the course

The main goal of the subject is to introduce the opportunities and reveal the beauty of computational electrodynamics. The second goal is to encourage students' curiosity to understand and investigate deeply the surrounding environment and phenomena related to electric, magnetic, and electromagnetic fields.

Educational Methods

The course is delivered through a combination of lectures, practical exercises, group discussions, and multimedia presentations. Emphasis is placed on applying theoretical knowledge through hands-on activities and collaborative work. Students are also encouraged to engage in independent study and research to deepen their understanding.

Prerequisites

Basic knowledge of mathematics and physics is desirable.

Enrollment for training in the discipline

The subject is elective for students majoring in Computer Systems and Technologies.

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises, and the educational department.

WEB DESIGN

ECTS credits: 6	Semester: V
Evaluation: exam	Hours per week: 1 Lectures + 2 laboratory exercises
Course type: lectures + laboratory exercises	Course status: Compulsory
	Degree course: Computer Systems and Technologies

Lecturer: Assoc. Prof. Fatima Sapundzhi, PhD – sapundzhi@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.

Annotation

The course “Web Design” is required for students studying “Intelligent Business Systems and Logistics” at the Faculty of Engineering of South-West University "Neofit Rilski" in Blagoevgrad.

The content of the curriculum covers issues related to the basic concepts and standards of modern web technologies and the principles of building web applications. The current environments and technologies for developing web applications such as HTML, CSS, JavaScript, PHP and MySQL are examined. In the practical classes, students acquire knowledge and skills for building a comprehensive interactive design with leading web programming technologies, for using databases and business models in the web, competencies and practical experience in developing and using information and communication technologies to solve business problems.

Purpose of the course

Course objectives are to provide students with theoretical and practical knowledge of modern web technologies and systems that are used to develop web applications. We aim to prepare highly qualified specialists who can design and organize company activities in accordance with modern technological requirements.

Educational Methods

The course is conducted through lectures and laboratory exercises, using interactive teaching methods consistent with modern standards for ICT education. During lectures, multimedia presentations are used to present information, which is illustrated with visual materials. Multimedia projector is used. Each lecture includes practical examples and tasks that are solved in real time, encouraging active dialogue and discussions throughout.

Laboratory exercises are held in a fully equipped computer room, where each student has access to an individual workstation with the necessary hardware and pre-installed software. At the end of each laboratory exercise, students submit their solutions electronically through modern platforms for the exchange and assessment of educational content.

Prerequisites

Determining the students’ prior knowledge and skills related to the course, as well as their learning style, motivation, and interests, is an important factor in achieving the course objectives. Various approaches are used to assess the students’ entry level, including tests or short written reports. Course content, scope, depth, and teaching methods can be adapted according to the identified level of preparedness.

PROJECT DIGITAL ELECTRONICS

ECTS credits: 3	Semester: V
Evaluation: ongoing assessment	Hours per week: 2 laboratory exercises
Course type: exercises	Course status: Elective
	Degree course: Computer systems and technologies

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.

Annotation

The course includes basic principles related to digital electronic circuits, electronic modules and systems and the necessary connections between them.

Purpose of the course

The aim of the course is for students to acquire the necessary minimum theoretical and applied knowledge of the principles of operation and design of the most common digital electronic circuits and modules used and applied by the most famous suppliers of such equipment in the world.

Educational Methods

The aim of the course is for students to acquire the necessary minimum theoretical and practical-applied knowledge of the principles of operation and design of the most common digital electronic circuits and modules used and applied by the most famous suppliers of such equipment in the world.

Prerequisites

Establishing the preliminary knowledge and skills of students in the discipline, their learning style, motives and interests in the discipline is an important factor in achieving the goals and objectives. To clarify these features, different approaches are provided for establishing the entry level of students, such as: conducting oral talks, test questionnaires or reports from students. Depending on the level of preliminary preparation shown, an update of the content, volume and depth of the topics covered, as well as teaching methods is envisaged.

Enrollment for training in the discipline:

The course is Elective and is studied by all students majoring in Computer systems and technologies

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

PROJECT TRANSDUCER TECHNOLOGY AND POWER SUPPLY

ECTS credits: 3	Semester: V
Evaluation: ongoing assessment	Hours per week: 2 Laboratories
Course type: laboratory exercises	Course status: Elective
	Degree course: Computer systems and technologies

Lecturer: Ch. Assist. Prof. Ivo Angelov, PhD – ivo.angelov@swu.bg

Assistant: Ch. 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

Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.

Annotation

The course "Project Transducer Technology and Power Supply" introduces students to the power supply and converter devices used to power electronic equipment and computers. Attention is paid to the design of a specific power supply device by prior arrangement. Each student receives a specific assignment, and then must design a device that meets the assignment. The result is formed as a term paper. Through the planned exercises, skills and habits for transferring knowledge in practice are acquired and current control of students' knowledge is carried out.

Purpose of the course

The aim of the course is for students to acquire knowledge and skills about the principles of operation, device, design methodology of the most common power supply and converter devices.

Educational Methods

The laboratory exercises are conducted in a computer room. A face-to-face conversation, dialogue with the more active students and argumentation of their opinions in the discussion and solution of the specific practical tasks are envisaged. From the relevant printouts with theoretical parts and tasks for implementation, students are informed about the topics of specific exercises and additional literature.

Prerequisites

Establishing the preliminary knowledge and skills of students in the discipline, their learning style, motives and interests in the discipline is an important factor in achieving the goals and objectives. To clarify these features, different approaches are provided for establishing the entry level of students, such as: conducting oral talks, test questionnaires or reports from students. Depending on the level of preliminary preparation shown, an update of the content, volume and depth of the topics covered, as well as teaching methods is envisaged.

Enrollment for training in the discipline

The course is Elective and is studied by all students majoring in Computer systems and technologies

Exam registration:

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

PROJECT ON COMPUTER NETWORKS

ECTS credits: 2	Semester: VI
Evaluation: ongoing assessment	Hours per week: 2 exercise
Course type: course project	Course status: Elective
	Degree course: Computer systems and technologies

Lecturer: [Assoc. Prof. Dr. Ivan Nedyalkov - i.nedqlkov@gmail.com](mailto:i.nedqlkov@gmail.com)

Assistant: [Assoc. Prof. Dr. Ivan Nedyalkov - i.nedqlkov@gmail.com](mailto:i.nedqlkov@gmail.com)

Department: "Communication and computer engineering" - technical_kktt@swu.bg

Faculty: - Faculty of Engineering technical@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mihailov Str

Annotation

The course on "Computer Networks Project" is based on solving a practical problem in the field of Computer Networks, which future professionals may encounter in their daily work. Students are given a task to solve such as: building a local computer network, configuring a router, filling in the routing table, creating different network cables, installing different types of network cards, building a wireless network, etc.

Purpose of the course

The course "Computer Networking Project" aims to provide students with practical skills in the field of building and maintaining computer networks. Through the development of a course project, students must consolidate the knowledge acquired in this area. Solving the task helps to build a quality specialist who is able to make independent and adequate decisions.

Educational Methods

During the course, laboratory exercises are held, in which students discuss the problems encountered in solving their task, comment on possible options for solving the problem, present temporary results and receive recommendations and guidance.

Prerequisites

Establishing the preliminary knowledge and skills of students in the discipline, their learning style, motives and interests in the discipline is an important factor in achieving the goals and objectives. To clarify these features, different approaches are provided for establishing the entry level of students, such as: conducting oral talks, test questionnaires or reports from students. Depending on the level of preliminary preparation shown, an update of the content, volume and depth of the topics covered, as well as teaching methods is envisaged.

Enrollment for training in the discipline

The course is elective for students in computer systems and technologies.

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

PROJECT ON COMPUTER PERIPHERALS AND INTERFACES

ECTS credits: 2	Semester: VI
Evaluation: ongoing assessment	Hours per week: 2 Laboratories
Course type: laboratory exercises	Course status: Elective
	Degree course: Computer systems and technologies

Lecturer: Assoc. Prof., Eng. Ludmila Taneva, PhD – lucy_t@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.

Assistant: Assist. Pavel Djunev – djunev@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.

Annotation

The course on "Computer Peripherals and Interfaces Project" is based on solving a practical problem in the field of Computer Peripherals, which future professionals may encounter in their daily work. Students are given a task to solve the type of: installation and configuration of different types of peripherals (video cards, sound cards, hard drives, optical drives, etc.), building RAID arrays of different levels, installation and configuration of different types printers, setting up computer ports, connecting different types of monitors, projectors, scanners, knowing the characteristics of different types of interfaces, etc.

Purpose of the course

The course "Computer Peripherals and Interfaces Project" aims to provide students with practical skills in the installation and maintenance of computer peripherals. Through the development of a course project, students must consolidate the knowledge acquired in this area. Solving the task helps to build a quality specialist who is able to make independent and adequate decisions.

Educational Methods

During the course, laboratory exercises are held, in which students discuss the problems encountered in solving their task, comment on possible options for solving the problem, present temporary results and receive recommendations and guidance.

Prerequisites

Establishing the preliminary knowledge and skills of students in the discipline, their learning style, motives and interests in the discipline is an important factor in achieving the goals and objectives. To clarify these features, different approaches are provided for establishing the entry level of students, such as: conducting oral talks, test questionnaires or reports from students. Depending on the level of preliminary preparation shown, an update of the content, volume and depth of the topics covered, as well as teaching methods is envisaged.

Enrollment for training in the discipline

The course is Elective and is studied by all students majoring in Computer systems and technologies

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

WRITTEN AND SPEECH CULTURE

ECTS credits: 2	Semester: VI
Evaluation: ongoing assessment	Hours per week: 2 laboratory exercises
Course type lectures and exercises	Course status: Elective Degree course: Computer systems and technologies

Lecturer: Assist. Prof. Dr. Nadelina Ivova.– nadelina_ivova@swu.bg

Assistant: Assist. Prof. Dr. Nadelina Ivova - nadelina_ivova@swu.bg

Department: "Bulgarian language" - filologia@swu.bg

Faculty: Faculty of Philology - filologia@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mihailov Str

Annotation

The course consists of 30 hours of lectures and the number of hours for extracurricular activities is 30.

The training is carried out according to a curriculum situated in one module, which is a lecture. It includes a set of main topics, specially selected from the field of spelling and orthography in the modern Bulgarian literary language.

It is the duty of the teacher for each subsequent lesson to set a topic and literary sources related to it, and it is the duty of the student in the time for extracurricular activities to prepare independently on the cases of this top

Purpose of the course

The aim of the course is to form in students the ability to use correctly the spelling and orthographic rules operating in the modern Bulgarian literary language. To form in students the ability to explain the mechanism of the admitted spelling or orthographic inaccuracy and the reasons that led to it - assimilation or dissimilation process, dialectal influence, etc.

To cultivate respect for the creative genius of the Bulgarian, embodied in the Bulgarian language.

Educational Methods

The course is held in lecture halls with students from ICT, KST and EEA. The exercises are conducted in groups, and usually the groups are composed of 10-15 students

Prerequisites

Basic knowledge of Bulgarian language and literature is desirable.

Enrollment for training in the discipline

The course f for students majoring in Computer systems and technologies.

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

HISTORY AND DEVELOPMENT OF ELECTRONIC AND COMPUTER ENGINEERING

ECTS credits: 2	Semester: VII
Evaluation: ongoing assessment	Hours per week: 2 Laboratories
Course type: course project	Course status: Elective
	Degree course: Computer systems and technologies

Lecturer: Prof. Peter Apostolov, Sc.D – p_apostolov@swu.bg

Assistant: Prof. Peter Apostolov, Sc.D – p_apostolov@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.

Annotation

The course is included in the curriculum as an elective course for students majoring in Computer Systems and Technologies in the seventh semester of their studies. The course "History and Development of Electronic and Computer Engineering" has an inbound relationship with Microprocessor Engineering, Operating Systems, Computer Architectures, Data Transmission and Computer Communications.

Purpose of the course

The aim of the course is for students to gain basic theoretical knowledge. On the development of electronic and computer equipment and technologies.

Educational Methods

Exercises, independent work with textbooks and scientific literature, exercises, collective discussion and discussion on the tasks, independent work.

Prerequisites

Establishing the preliminary knowledge and skills of students in the discipline, their learning style, motives and interests in the discipline is an important factor in achieving the goals and objectives. To clarify these features, different approaches are provided for establishing the entry level of students, such as: conducting oral talks, test questionnaires or reports from students. Depending on the level of preliminary preparation shown, an update of the content, volume and depth of the topics covered, as well as teaching methods is envisaged.

Enrollment for training in the discipline

The course is elective and is studied by all students majoring in Computer systems and technologies.

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

TELECOMMUNICATION EQUIPMENT

ECTS credits: 6	Semester: VII
Evaluation: written exam	Hours per week: 2 Lectures + 1 Laboratory
Course type: lectures + laboratory exercises	Course status: Elective
	Degree course: Computer systems and technologies

Lecturer: Assoc. Prof. Gabriela Atanasova, PhD – gatanasova@swu.bg

Assistant: Assist. Eng Georgi Georgiev, PhD – goshko.georgiev@gmail.com

Department: Communication and Computer Engineering – technical_kktt@swu.bg

Faculty: Faculty of Engineering – technical@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.

Annotation

The course "Telecommunication Technology" covers basic issues related to terminal devices, multiplex and switching systems, transmission cable lines, architecture and basic functionality of fixed and cellular networks for mobile communications, signaling and control in telecommunications networks.

Purpose of the course

The aim of the course "Telecommunication Engineering" to give students a systematic knowledge of telecommunications terminals and devices, multiplex and switching systems, architecture and basic functionality of fixed and cellular networks for mobile communications, signaling in telecommunications networks and networks of the following generation.

Educational Methods:

The course is held in lecture halls with students from KST. The exercises are conducted in groups in a laboratory.

Prerequisites

Establishing the preliminary knowledge and skills of students in the discipline, their learning style, motives and interests in the discipline is an important factor in achieving the goals and objectives. To clarify these features, different approaches are provided for establishing the entry level of students, such as: conducting oral talks, test questionnaires or reports from students. Depending on the level of preliminary preparation shown, an update of the content, volume and depth of the topics covered, as well as teaching methods is envisaged.

Enrollment for training in the discipline

The course is mandatory and is studied by all students majoring in Computer systems and technologies

Exam registration:

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

SECURITY AND MONITORING SYSTEMS

ECTS credits: 6	Semester: VII
Form for checking knowledge: written exam	Weekly horarium: 2 lectures. +1 lab. exercises
Course type: lectures and laboratory exercises	Status of the discipline: Selectable
	Specialty: Computer systems and technologies

Lecturer: Chief Assistant Professor, Eng. Filip Tsvetanov PhD
ftsvetanov@swu.bg

Department: „Communication and computer technique and technology“
– technical_kktt@swu.bg

Faculty: Faculty of Engineering – technical@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mihaylov Street

Course description

The course "Security and Monitoring Systems" covers the main issues related to the characteristics, designs, and operating principles of sensors and elements used in constructing video surveillance systems, monitoring video control of various objects and processes, fire safety, and security of various objects. Students are introduced to the methodology for designing security and monitoring systems depending on the specifics of various processes and objects.

Course Objective:

The aim of the course "Security and Monitoring Systems" is for students to acquire knowledge about the goals, tasks, physical nature of the technical means from which a security and monitoring system is built, its specificity depending on the field of application, as well as the trends in construction by replacing wiring with sensors and modules that transmit information between each other via radio signals.

Students must be able to optimally select technical means for building video surveillance, security, and monitoring systems. To develop and offer new, creative solutions for the use of technical means in the field of security. To design and build security systems, video surveillance and monitoring systems, independently or in a team.

Teaching methods

The training is conducted using modern interactive methods, encouraging active participation and application of knowledge in practical conditions. The lecture material is supplemented with laboratory exercises using specialized equipment, computers, microcontrollers, and simulation software products. Emphasis is placed on the practical mastery of the content through project work, simulations, and solving cases related to real engineering tasks.

Pre-conditions

Knowledge of Engineering Mathematics, Physics, Digital Electronics, Digital Signal Processing, and Programming is desirable.

Enrollment for training in the discipline:

The discipline is optional (selectable) for students majoring in Information and Communication Technologies. In the previous semester, each student declared their choice of discipline from the elective group in writing.

Exam registration

All students who have been certified for the semester by the student department and have collected the necessary credits from the current control in the discipline are allowed to take the exam.

FUNDAMENTALS OF MOBILE COMMUNICATIONS

ECTS credits: 6	Semester: VII
Evaluation: written exam	Hours per week: 2 Lectures + 1 Laboratory
Course type: lectures + laboratory exercises	Course status: Compulsory
	Degree course: Computer systems and technologies

Lecturer: Assoc. Prof. Gabriela Atanasova, PhD – gatanasova@swu.bg

Assistant: Assist. Eng Georgi Georgiev, PhD – goshko.georgiev@gmail.com

Department: Communication and Computer Engineering – technical_kktt@swu.bg

Faculty: Faculty of Engineering – technical@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.

Annotation

By studying the course "Fundamentals of Mobile Communications" students get acquainted with the basic theoretical principles in the construction and operation of mobile telecommunications systems for different purposes, which have different territorial coverage, different subscriber and traffic capacity and work in different frequency bands. This course examines the main building blocks of mobile systems, their integration into the overall local and global communication system, their management and related signals. The main types of terminals and the specifics of their application are considered.

Purpose of the course

The aim of the course is to give students a systematic knowledge of the basic principles on which the different types of mobile systems are built, the specific features of each of them, their areas of application and the different types of terminal devices. The training in the course aims to get acquainted in detail with the implementation and modes of operation in mobile systems, with the peculiarities of their management, synchronization and signaling.

Educational Methods

Lecture, independent work with a textbook and scientific literature, exercises, collective discussion and discussion on the tasks, independent work.

Prerequisites

Establishing the preliminary knowledge and skills of students in the discipline, their learning style, motives and interests in the discipline is an important factor in achieving the goals and objectives. To clarify these features, different approaches are provided for establishing the entry level of students, such as: conducting oral talks, test questionnaires or reports from students. Depending on the level of preliminary preparation shown, an update of the content, volume and depth of the topics covered, as well as teaching methods is envisaged.

Enrollment for training in the discipline

The course is mandatory and is studied by all students majoring in Computer systems and technologies

Exam registration:

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

SIGNAL PROCESSORS

ECTS credits: 4	Semester: VIII
Evaluation: written exam	Hours per week: 1 Lectures + 2 Laboratories
Course type: lectures+ laboratory exercises	Course status: Elective
	Degree course: Computer systems and technologies

Lecturer: chief. assist. eng. Georgi Georgiev, PhD – g.georgiev@swu.bg

Assistant: chief. assist. eng. Georgi Georgiev, PhD – g.georgiev@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.

Annotation

The course on "Signal Processors" is related to the development of students' abilities to use signal processors as one of the most modern and promising tools, on the one hand for hardware implementation, and on the other hand using software implementation in these processors of specific methods and algorithms for signal processing, audio and video information.

Purpose of the course

The course "Signal Processors" aims to study and be able to study signal processors in the implementation of methods, technologies and technical means in telecommunications systems and networks, in audio and video systems.

Educational Methods

The course is held in lecture halls. The exercises are conducted in groups in a laboratory.

Prerequisites

Establishing the preliminary knowledge and skills of students in the discipline, their learning style, motives and interests in the discipline is an important factor in achieving the goals and objectives. To clarify these features, different approaches are provided for establishing the entry level of students, such as: conducting oral talks, test questionnaires or reports from students. Depending on the level of preliminary preparation shown, an update of the content, volume and depth of the topics covered, as well as teaching methods, is envisaged.

Enrollment for training in the discipline

The course is mandatory and is studied by all students majoring in Computer Systems and Technologies.

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

PROCESSING AND CODING OF AUDIO SIGNALS

ECTS credits: 4	Semester: VIII
Evaluation: written exam	Hours per week: 1 Lecture + 2 Laboratories
Course type: lectures + laboratory exercises	Course status: Elective
	Degree course: Computer systems and technologies

Lecturer: Prof. Peter Apostolov, ScD – p_apostolov@swu.bg

Assistant: Assist. Eng Georgi Georgiev, PhD – goshko.georgiev@gmail.com

Department: Communication and Computer Engineering – technical_kktt@swu.bg

Faculty: Faculty of Engineering – technical@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.

Annotation

The course "Processing and coding of audio signals" introduces students to the basic theoretical principles in the processing and formation of analog and digital audio signals and the formats in which they are presented during recording, transmission over a communication channel and during reproduction. This course covers the basic building blocks of analog and digital audio systems for recording, playback and sound. with advanced technologies for compact presentation of sound signals.

Purpose of the course

The purpose of "Processing and coding of audio signals" is to give students a systematic knowledge of the basic principles on which analog and digital sound systems are built, the specific features of processing, storage and reproduction of audio signals.

Educational Methods

Lecture, independent work with a textbook and scientific literature, exercises, collective discussion and discussion on the tasks, independent work.

Prerequisites

Establishing the preliminary knowledge and skills of students in the discipline, their learning style, motives and interests in the discipline is an important factor in achieving the goals and objectives. To clarify these features, different approaches are provided for establishing the entry level of students, such as: conducting oral talks, test questionnaires or reports from students. Depending on the level of preliminary preparation shown, an update of the content, volume and depth of the topics covered, as well as teaching methods is envisaged.

Enrollment for training in the discipline

The course is mandatory and is studied by all students majoring in Computer systems and technologies

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

PROGRAMMABLE LOGICAL CONTROLLERS

ECTS credits: 4	Semester: VIII
Evaluation: written exam	Hours per week: 1 lecture + 2 laboratory exercises
Course type: lectures + laboratory exercises	Course status: Elective
	Degree course: Computer systems and technologies

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.

Annotation

The course includes basic principles concerning programmable logic controllers and computerized systems as well as the necessary connections between those that control various technological processes and systems in industry.

Purpose of the course

The aim of the course is for students to acquire the necessary minimum theoretical and applied knowledge of the principles of operation and design of the most common PLC, to get acquainted with the basic principles of programming and their use.

Educational Methods

Active methods are used through laboratory exercises in a laboratory equipped with the necessary equipment and models, tests for knowledge control are conducted, and the solution of relevant practical classes is assigned, discussions and presentations of Power Point papers are made.

Prerequisites

Establishing the preliminary knowledge and skills of students in the discipline, their learning style, motives and interests in the discipline is an important factor in achieving the goals and objectives. To clarify these features, different approaches are provided for establishing the entry level of students, such as: conducting oral talks, test questionnaires or reports from students. Depending on the level of preliminary preparation shown, an update of the content, volume and depth of the topics covered, as well as teaching methods is envisaged.

Enrollment for training in the discipline:

The course is Elective and is studied by all students majoring in Computer systems and technologies

Exam registration:

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

PROGRAMMABLE LOGICAL DEVICES

ECTS credits: 4	Semester: VIII
Evaluation: written exam	Hours per week: 1 lecture + 2 laboratory exercises
Course type: lectures + laboratory exercises	Course status: Elective
	Degree course: Computer systems and technologies

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.

Annotation

The course includes basic principles concerning programmable logic devices and computerized systems as well as the necessary connections between which control various technological processes and systems in industry.

Purpose of the course

The aim of the course is for students to acquire the necessary minimum theoretical and applied knowledge of the principles of operation and design of the most common programmable logic devices, to get acquainted with the basic principles of programming and their use.

Educational Methods

Active methods are used through laboratory exercises in a laboratory equipped with the necessary equipment and models, tests for knowledge control are conducted, and the solution of relevant practical classes is assigned, discussions and presentations of Power Point papers are made.

Prerequisites

Establishing the preliminary knowledge and skills of students in the discipline, their learning style, motives and interests in the discipline is an important factor in achieving the goals and objectives. To clarify these features, different approaches are provided for establishing the entry level of students, such as: conducting oral talks, test questionnaires or reports from students. Depending on the level of preliminary preparation shown, an update of the content, volume and depth of the topics covered, as well as teaching methods is envisaged.

Enrollment for training in the discipline

The course is Elective and is studied by all students majoring in Computer systems and technologies

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.

MULTIMEDIA TECHNOLOGIES

ECTS credits: 4	Semester: VIII
Evaluation: written exam	Hours per week: 1 lecture + 2 laboratory exercises
Course type: lectures + laboratory exercises	Course status: Elective
	Degree course: Computer systems and technologies

Lecturer: Assoc. Prof., Eng. Ivan Trenchev, PhD – trenchev@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.

Annotation

The program offers specialized practical training in the field of multimedia, computer design, three-dimensional modeling and computer graphics. The training is carried out in three main areas - development and integration of multimedia applications, three-dimensional modeling and design, computer animation. The content and structure of the lectures reflect the latest trends in the development of relevant technologies. Extracurricular learning forms include projects, practical assignments, term papers.

Purpose of the course

Skills to develop individually and in a team of:

- projects that combine the application of modern technological solutions with the creation of artistically made products;
- for application of the main technological means in the field of multimedia, computer graphics and animation and can purposefully apply them in the development of practical tasks.

Educational Methods

The course is held in lecture halls together with the students from the bachelor's programs of the Technical Faculty. The exercises are conducted in groups, and usually the groups are composed of 12 students.

Prerequisites

Establishing the preliminary knowledge and skills of students in the discipline, their learning style, motives and interests in the discipline is an important factor in achieving the goals and objectives. To clarify these features, different approaches are provided for establishing the entry level of students, such as: conducting oral talks, test questionnaires or reports from students. Depending on the level of preliminary preparation shown, an update of the content, volume and depth of the topics covered, as well as teaching methods is envisaged.

Enrollment for training in the discipline

The course is Elective and is studied by all students majoring in Computer systems and technologies

Exam registration

The registration for the formation of the complex current assessment is coordinated with the holder of the discipline, the leader of the exercises and the educational department.