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 majoring in "Computer Systems and Technologies", Bachelor's Degree, must be prepared to perform activities such as: design, manufacture and operation of units and devices in computer and communication systems and networks, research, implementation, modeling and operation of facilities, specialized technological equipment and means for connection with stationary and mobile sites, operation and maintenance of information means and technologies for realization of marketing activity in the field of computer systems and technologies, design and maintenance of technical means for automation, control and technological provision of mobile communication systems; design and software of computer means for management of communication facilities; ensuring quality of service by measuring and controlling the parameters of computer and communication networks and systems, as well as application of methods for digital processing and protection of information.

Acquiring knowledge, skills and competencies for these activities requires training to provide:

- theoretical knowledge in order to be able to design and operate units and devices on analog, digital and optical principle, on systems for processing and transmission of analog and digital information;
- practical knowledge, skills and habits acquired during the seminars, laboratory and practical exercises, in accordance with the nature of their future work;
- adaptability in accordance with the changing conditions in the realization of the specialists;
- use of modern computer technology to automate their work and business.

This knowledge is acquired on the basis of fundamental and special training and specialized courses in the field of computer and information technology, increasing the professional skills of the specialist.

The training of the specialists in the bachelor's program of "Computer Systems and Technologies" is in accordance with the Bulgarian and world experience on the basis of an in-depth analysis of the curricula and programs for similar specialties of our and foreign universities, universities and colleges.

PROFESSIONAL SKILLS AND COMPETENCE

Graduates of the specialty "Computer Systems and Technologies" with a Bachelor's degree acquire professional skills and competencies:

- managing complex professional activities, including teams and resources;
- to maintain the norms and technical indicators of computer systems and equipment;
- for application of computer and information technologies in setup, control, diagnostics and maintenance of computer and telecommunication systems and networks;
- for development, use, implementation and operation of systems in the field of computer and communication systems - fixed, mobile, wireless communications;
- for processing, storage and transmission of information; security and information security technologies.

DEGREE COURSE OF "COMPUTER SYSTEMS and TECHNOLOGIES" CURRICULUM

First academic year			
First Semester	ECTS credits	Second Semester	ECTS credits
Mathematics For Engineers I	6	Mathematics For Engineers II	6
Foreign Language I	3	Physics For Engineers II	5
Programing I	6	Electrical Engineering I	6
Engineering Graphics	5	Foreign Language II	3
Physics For Engineers – I	5	Constructing Elements In Electronics	5
Electrotechnical Materials	5	Electrical Measurements	5
Sport /Electively/	0	Sport /Electively/	0
	Total: 30		Total: 30
Second academic year			
First Semester	ECTS credits	Second Semester	ECTS credits
Data Transfer And Computer Communications	5	Digital Electronic	6
Mathematics For Engineers III	6	Power Conversion Techniques And Power Supplies	5
Analogue Electronic	5	Cryptography and data protection	4
Electrical Engineering II	6	Computer architectures	6

	ECTS credits		ECTS credits
Technological Practice I: Constructing Elements	3	Programming II	5
Signal and Systems	5	Digital signal processing	4
	Total: 30		Total: 30

Third academic year

First Semester	ECTS credits	Second Semester	ECTS credits
Elective course from group I.	6	Databases	6
Foreign language III	4	Microprocessor technology	6
Operation Systems	6	Optical communication systems	6
Synthesis and analysis of algorithms	5	*Technological Practice II*: Design and manufacture of electronic devices	4
Computer peripherals and interfaces	6	Sensors and sensor networks	6
Elective course from group II.	3	Elective course from group III	2
	Total: 30		Total: 30

Fourth academic year

Firs semester	ECTS credits	Second semester	ECTS credits
Technology on the Internet	6	Elective course from group V	4
Applications for mobile operating systems	6	Elective course from group VI	4
Computer networks	6	Computer systems for real - time measurement	6
Technological Practice III: Reliability and diagnostics of computers	2	Undergraduate design	6
Elective course from group IV	6	State exam / thesis defense	10
Network and information security	4		
	Total: 30		Total: 30

TOTAL: 240 CREDITS FOR FOUR ACADEMIC YEARS

MATHEMATICS FOR ENGINEERS – 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: Information and communication technologies

Lecturer: Prof. Il. Gudzhenov - iliadgl@swu.bg

Assistant: ch. Assistant Professor Dr. Anka Markovska - a_markovska@swu.bg

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

Faculty: Faculty of Engineering – technical@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.

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Annotation:

The 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 "Information and Communication 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: Information and communication technologies

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

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

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.

POGRAMING I

ECTS credits: 6	**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.

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Assistant: Assist. Prof. Dr. Eng. Ivan Todorin - ivan_todorin@gmail.com

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

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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.

ENGINEERING GRAPHICS

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., Dr. Eng. Evdokia Petkova - e.p.petkova@swu.bg

Department: Technological training and vocational education – technical_mtt@swu.bg

Faculty: Faculty of Engineering – technical@swu.bg

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Annotation:

Course "Engineering Graphics" is designed to introduce students to the methods of image creation and standards related to engineering graphics.

The course is related to training on technical drawing, mathematics and informatics in primary and secondary school.

Students need to master the necessary knowledge and to develop skills and competencies to implement and reading graphic images of geometric and technical objects.

Purpose of the course:

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

Educational Methods:

Lectures and practical exercises.

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

PHYSICS FOR ENGINEERS – I

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 Information and communication technologies

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

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

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

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

Faculty: Faculty of Engineering – technical@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.

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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.

ELECTROTECHNICAL MATERIALS

ECTS credits: 5	**Semester:** 1st
Evaluation: ongoing assessment	**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: part-time lecturer Vasil Kovachev – **vasbl@swu.bg**

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

Faculty: Faculty of Engineering – technical@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.

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Annotation:

The 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.

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: Prof. Oleg Mushkarov, DSc – muskarov@math.bas.bg

Department: Mathematics

Faculty: Faculty of Natural Sciences and Mathematics - pmf@swu.b

Assistant: Chief Assist. Prof. Anka Markovska, PhD – a_markovska@swu.bg

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

Faculty: Faculty of Engineering – technical@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.

Phone: +359-73-88 51 62

Annotation:

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.

Educational Methods:

Lectures and lab exercises. 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:

Knowledge of Engineering Mathematics 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.

PHYSICS FOR ENGINEERS – II

ECTS credits: 6	**Semester:** 2 nd
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. Dimitrina Kerina, PhD – d_kerina@swu.bg

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> *Faculty:* Faculty of Engineering – technical@swu.bg

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

> *Phone:* +359-73-88 51 62

Assisstant: Assoc. Prof. Dr. Rayka Stoyanova - rajka@swu.bg

> *Department*: "Mechanical Engineering and Technology" - technical_mtt@swu.bg

Annotation:

The lecture material on the subject Engineering Physics - II is divided into the following sections: Electrostatics, Stationary electromagnetic field, Variable electromagnetic field, Electromagnetic phenomena in matter, Electromagnetic waves and Wave optics. 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 – II aims to provide knowledge about fundamental natural laws, electromagnetic and optic phenomena and basic Physical methods for investigations.

Educational Methods:

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

Prerequisites:

Basic 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.

ELECTRICAL ENGINEERING I

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

Lecturer Prof. Dr. Galina Cherneva - galja_cherneva@abv.bg

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

Faculty: Faculty of Engineering – technical@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.

Assisstant*:* Assoc. Prof. Dr. Ivan Nedyalkov - 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

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Annotation

The content of the curriculum covers topics related to basic elements, laws and methods for analysis of electrical circuits, established DC and sinusoidal modes in electrical circuits, circuits with mutual inductance and three-phase circuits.

A student who has successfully passed the exam in the discipline "Theoretical Electrical Engineering I" acquires basic knowledge, skills and competencies to analyze electrical circuits in different established modes, knows and uses the conditions for assigning maximum power to load, knows the basic dependencies in three-phase circuits.

In the classes for seminars students solve problems related to the basic laws and methods for analysis of linear electrical circuits in sinusoidal and DC modes, circuits with mutual inductance and power balance.

In the practice classes, students study and analyze linear electrical circuits in sinusoidal and DC modes, resonant states in electrical circuits and three-phase systems.

Purpose of the course:

The aim of the course "Theoretical Electrical Engineering I" is to give students basic knowledge for the study of electrical circuits, with a view to their application in specific electrical and electronic devices and systems.

Educational Methods:

Lectures, seminar and laboratory exercises. 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 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 exercise
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.

Phone: +359-73-88 51 62

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.

CONSTRUCTING ELEMENTS IN ELECTRONICS

ECTS credits: 4	**Semester:** 2nd
Evaluation: ongoing assessment	**Hours per week:** 2 lectures+1 laboratory exercise
Course type: lectures+ laboratory exercises	**Course status:** Compulsory
	Degree course: Computersystems and technologies

Lecturer: Assoc. Prof., Eng. Valeri Vachkov, PhD – v.vatchkov@swu.bg

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

Faculty: Faculty of Engineering – technical@swu.bg

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Annotation:

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

Purpose of the course:

By means of the subject "Semiconductor elements" the students get acquainted with basic elements of the physics of semiconductors and PN transition, composition, way of work, characteristics, parameters and equivalent elements schemes of semiconductors in discrete and chips application.

Some typical applications are studied. The subject is a basic introductory subject in the electronics science and is studied after the courses in mathematics, physics, and electrical physics. It has basic relations to the consequent specialized courses in electronics, computer science and metrics.

Educational Methods:

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

Prerequisites:

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

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: Assoc. Prof. Dr. Eng. Ulyana Paskaleva PhD – paskaleva_6@swu.bg, uli_6@abv.bg

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

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Assistant: Assist. Dr. Eng Maia Angelova - maia_angelova67@abv.bg

Department: "Technological training and vocational education " - topo@swu.bg

Faculty: - Faculty of Engineering technical@swu.bg

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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:

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

Educational Methods:

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

Prerequisites:

Knowledge of Engineering Mathematics I, Engineering Physics I, Theoretical Electrical Engineering 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.

DATA TRANSFER AND COMPUTER COMMUNICATIONS

ECTS credits: 6	**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. Dr. Filip Batalov **-** batalov@swu.bg

Assistant Assoc. Prof. Dr. Filip Batalov **-** batalov@swu.bg

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

Faculty: Faculty of Engineering – technical@swu.bg

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Annotation:

The training course "Data Transmission and Computer Communications" presents modern concepts in the development of this field of communications. The course "Data transmission and computer communication" aims to acquaint students with: methods and means of data transmission in computer and communication networks. The protocol architectures of the TCP / IP and OSI model for data transmission are considered, as well as the basic concepts in data transmission, the parameters of the communication signals and the communication channels, the types of transmission media. Particular attention is paid to topics related to linear coding and modulation of digital signals, methods for detecting and correcting bit and dynamic errors in digital data transmission, coding and manipulation of digital signals, protocols for automatic control of the channel layer and modes for Data Transmission.

Purpose of the course:

The aim of the course is for students to get acquainted with modern concepts of data transmission, parameters of communication signals and communication channels, methods for detecting and correcting household and dynamic errors in digital data transmission, coding and manipulation of digital signals, protocols for automatic channel layer control and data transmission modes.

Educational Methods:

The course is held in lecture halls together with students majoring in "Electronics" and "Information and Communication Technologies". The exercises are conducted in laboratory groups of 10 students

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**.**

 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.

MATHEMATICS FOR ENGINEERS - III

ECTS credits: 5	**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. Vassil Grozdanov, PhD – vassgroz@swu.bg

Department: Mathematics – technical_kktt@swu.bg

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

Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.

Phone: +359-73-58 85 31

Assistant: Ch. Assist. Prof. Anka Markovska, PhD – a_markovska@swu.bg

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

Faculty: Faculty of Engineering – technical@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.

Phone: +359-73-88 51 62

Annotation:

The course in Mathematics for Engineers III part includes some special concepts of mathematical analysis, like Fourier series, Functions of complex variables, elements of the operation calculation. Also some elements of the theory of the probability and mathematical statistics are considered.

Purpose of the course:

Students should obtain knowledge for Mathematics III part, which is a basic mathematical discipline. This knowledge is necessary for studying of the main technical sciences.

Educational Methods:

 Lectures, seminars, homework, consultations, tests.

Prerequisites:

Knowledge of Engineering Mathematics I, Engineering Mathematics II 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: 6	**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.

Phone: +359-73-88 51 62

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

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

Faculty: Faculty of Engineering – technical@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.

Phone: +359-73-88 51 62

Annotation:

The training course includes basic issues related to 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, Building Elements in Electronics is desirable.

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.

ELECTRICAL ENGINEERING II

ECTS credits: 6	**Semester:** 3rd
Evaluation: written exam	**Hours per week:** 2 lectures+1 seminar exercise +1 laboratory exercise
Course type: lectures+ seminar laboratory exercises	**Course status:** Compulsory
	Degree course: Computer systems and technologies

Lecturer: Prof. Galina Cherneva - galja_cherneva@abv.bg

 Assistant: Assoc. Prof. Dr. Ivan Nedyalkov - 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

Phone. 073 88 51 62:

Annotation:

The course "Theoretical Electrical Engineering II" is part of the curricula of the respective specialties, as the study material is divided into 30 hours of lectures, 15 hours of seminars and 15 hours of practical exercises. Forms of current control and written exam are provided.

The content of the curriculum covers topics related to quadrupoles, transients in linear electrical circuits, distributed parameter circuits, magnetic circuits and electromagnetic fields.

In the classes for seminars the students solve problems for research of transients in linear electric circuits by different methods, analyze the processes in linear circuits with distributed parameters, solve basic differential dependences of the electromagnetic field.

In the practical classes, students explore experimentally and analytically the main points of the theoretical material. Computer modeling and simulation of transients in electrical circuits are performed in order for students to acquire the necessary practical skills.

Purpose of the course

" Electrical Engineering II" is to give students in a systematic way basic knowledge to analyze electrical and magnetic circuits, to apply the laws of analysis of electrical circuits, to know and use the conditions for giving the load maximum power, to use three-phase circuits.

Educational Methods:

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

Prerequisites:

Knowledge of Engineering Mathematics I, Engineering Mathematics II, Theoretical Electrical Engineering 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.

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: Assoc. Prof., Eng. Valeri Vachkov, PhD – v.vatchkov@swu.bg

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

Faculty: Faculty of Engineering – technical@swu.bg

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Annotation

The teaching material in the discipline Technological Workshop I: Building Elements is divided into three parts: the first refers to the components, their designation, parameters, research and replacement; the second - to the set of "small" and "large" integrated circuits used in computer systems; the third introduces students to the mechanical, electrical and system assembly and upgrade of 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, 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:

To acquaint students with the building blocks in electronics, the set of "small" and "large" integrated circuits used in computer systems and their assembly and renovation.

Educational Methods:

The exercises are conducted in subgroups. The laboratory exercise begins with checking the degree of assimilation of the study material and preparing students for the specific exercise. The rest of the time is used to solve specific practical tasks. 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. Establishing the entry level - it is possible that some students have the necessary skills and knowledge. At their request, after demonstrating mastery of the necessary material, they are assigned more complex tasks.

Enrollment for training in the discipline:

Compulsory course from the curriculum of the specialty "Computer Systems and Technologies", Bachelor's degree

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: 6	**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. F. Batalov - batalov@swu.bg

Assistant: Assist. Prof. Dr. Eng. Ivan Todorin - ivan_todorin@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.

Phone: +359-73-88 51 62

Annotation:

The course examines the basic concepts related to the representation of continuous and discrete signals and systems in the time and frequency domain. During their training students get acquainted with the spectral analysis of periodic and non-periodic signals, with the types of spectra and their main properties. Particular attention is paid to the nature of modulation and types of signal amplitude modulation, pulse modulation methods and their influence on bandwidth, increasing the bandwidth of communication systems, converting analog signals into digital form, types of digital filters and optimal linear filtering, noise-tolerant signal coding. By presenting the basic information about signals and systems in a basic course, students are given the opportunity to acquire fundamental knowledge that is necessary for the formation of their professional training in mastering the next specialized disciplines in the curriculum of the specialty.

Purpose of the course:

The aim of the course "Signals and Systems" is for students to have a look at the different possibilities for presenting signals and systems, their parameters, time and frequency characteristics needed to study their behavior in data transmission in communication channels related to the main processes - transmission, processing and storage of information.

Educational Methods:

The course is held in lecture halls together with students majoring in "Electronics" and "Information and Communication Technologies" and "Computer Systems and Technologies".

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 an oral discussion, 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.

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.

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

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

Faculty: Faculty of Engineering – technical@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.

Phone: **+359-73-88 51 62**

Annotation:

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

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:

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.

POWER CONVERSION TECHNIQUES AND POWER SUPPLIES

ECTS credits: 5	**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: Ch. Assist. Prof. Ivo Angelov, PhD – ivo.angelov@swu.bg

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

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> *Address:* 2700 Blagoevgrad, 66 Ivan Mihailov str.
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> *Phone:* +359-73-88 51 62

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:

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.

CRYPTOGRAPHY AND DATA PROTECTION

ECTS credits: 4	**Semester:** 4th
Evaluation: exam	**Hours per week :** 2Lect.+0S+1Lab.
Course type: lectures+ laboratory exercises	**Course status :** Compulsory
	Degree course: Computer systems and technologies

Lecturer: Ch. Assist. Prof. Margarita Todorova, PhD – **todorova@swu.bg**

Assistant:Ch.Assist. Prof. Margarita Todorova, PhD – **todorova@swu.bg**

Department: Informatics – informatics@swu.bg

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

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Annotation:
The course is mandatory in the 4th semester and aims to provide students with knowledge and skills on data protection against unauthorized access and cryptanalysis methods. Special attention is paid to cryptographic algorithms (symmetric and asymmetric) and to cryptanalysis.

Purpose of the course:
The goal of the course "Cryptography and Data Protection" is for students to acquire knowledge about the main goals, tasks and methods of data protection from unauthorized access, as well as methods of attack against modern systems.

Educational Methods:

Lectures, talks, discussions, practical verification of the work of the considered systems on examples, course 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.

COMPUTER ARCHITECTURES

ECTS credits: 6	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: 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.

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Assistant: Assist. Pavel Djunev – **djunev@swu.bg**

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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:
TThe 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.

PROGRAMING II

ECTS credits: 5	Semester: IV
Evaluation: ongoing assessment	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.

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Assistant: Assist. Prof. Dr. Eng. Ivan Todorin - ivan_todorin@gmail.com

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

Faculty: Faculty of Engineering – technical@swu.bg

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Annotation:

The course is designed to give students knowledge of modern programming languages (visual and object-oriented programming) and their application for solving physical problems, as well as some of the main tools for creating WEB applications. Emphasis is placed on the capabilities of the integrated software environments Delphi and Visual Studio, the ways of using the software tools of these environments. The basic principles of building databases and their use through visual software packages are given.

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 Web pages and sites and publish materials on the Internet.

Educational Method

The course is held in lecture and computer rooms. The application of interactive teaching methods is envisaged. The lectures are richly illustrated with graphic material, which is presented with a video projector.

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 for all students in Computer Systems and Technologies.

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.

DIGITAL SIGNAL PROCESSING

ECTS credits: 4	**Semester:** 4th
Evaluation: ongoing assessment	**Hours per week:** 2 lectures+ 1 exercise
Course type: lectures and exercises	**Course status:** Compulsory
	Degree course: Computer systems and technologies

Lecturer: Prof. Galina Cherneva - galja_cherneva@abv.bg

 Assistant: Assist. Prof. Dr. Ivan Todorin ivan_todorin@gmail.com

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> *Faculty*: - Faculty of Engineering   technical@swu.bg

> *Address*: 2700 Blagoevgrad, 66 Ivan Mihailov Str

> *Phone*. 073 88 51 62

Annotation:

The course "Digital signal processing" is part of the curricula of the respective specialties, as the study material is divided into 30 hours of lectures and 30 hours of seminars. Forms of current control and written exam are provided. The content of the curriculum covers topics related to discrete signals and systems, discrete order and Fourier transform, z-transform, digital filtering. In the classes for seminars students solve problems related to differential equations, basic operations in digital signal processing, analysis and synthesis of digital filters.

 Purpose of the course:

The study of the course "Digital Signal Processing" aims to acquaint students with the basic methods and algorithms of digital processing, discrete and fast Fourier transform, the main stages of digital filter design.

 Educational Methods:

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

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 Icomputer 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 .

DATA STRUCTURES AND ALGORITHMS

ECTS credits: 6	**Semester: V**
Evaluation: exam	**Hours per week : 1** Lectures + 2 Laboratories
Course type: lectures+ laboratory exercises	**Course status :** Elective
	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.

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Annotation:

The curriculum in "Data Structures and Algorithms" is designed for students majoring in "Computer Systems and Technologies" at SWU "Neofit Rilski" - Blagoevgrad. The course is designed to give students knowledge of the most commonly used data structures in programming. Students will learn in depth how lists, queues, stacks, hash tables, trees, graphs, and important optimization algorithms applicable in computer networks work. The exercises provided in the program aim to further develop the knowledge and create practical skills for using these algorithms.

Purpose of the course:

The aim of the course is for students to get acquainted with the basic optimization algorithms and their application, as well as to develop their algorithmic thinking. The student is expected to get an idea of the ability to model through data structures and to be able to make a program implementation of the proposed algorithms.

Educational Methods:

The course is held in lecture and computer rooms. The application of interactive teaching methods is envisaged. The lectures are richly illustrated with graphic material, which is presented with a video projector.

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.

SIMULATION PROGRAMS IN COMPUTER TECHNOLOGY

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

Lecturer: Assoc. Prof., Eng. Anton Stoilov, PhD – antonstoilov@swu.bg

Assistant: Assoc. Prof., Eng. Anton Stoilov, PhD – antonstoilov@swu.bg

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

Faculty: Faculty of Engineering – technical@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.

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Annotation:

The course "Simulation programs in computer technology" introduces students to the basic methods and algorithms underlying modern systems for automated design and analysis in electronics, the principles of their construction, the characteristics of their input languages and tools for controlling the computational process. The possibilities of these systems for modeling, analysis and simulation of different types of analog and digital circuits and devices, study of the influence of production tolerances on the circuit characteristics, stability study,

parametric analysis, optimization, as well as the possibilities of CAD for design automation are considered. on printed circuit boards.

Purpose of the course:

The aim of the course is for students to acquire knowledge about modern systems for automated design, analysis and simulation in electronics and trends in their development. To evaluate the possibilities for practical application in the production of electronic products. To clarify the systematic approach to product construction. To consider the possibilities for simulation of the operation of electronic circuits.

Educational Methods:

The course is held in lecture and computer rooms. The application of interactive teaching methods is envisaged. The lectures are richly illustrated with graphic material, which is presented with a video projector. Various software products are used to simulate the operation of electronic circuits, their research and design.

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.

WEB DESIGN

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

Lecturer: Assoc. Prof., Eng. Anton Stoilov, PhD – antonstoilov@swu.bg

Assistant: Assoc. Prof., Eng. Anton Stoilov, PhD – antonstoilov@swu.bg

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

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Phone: +359-73-88 51 62

Annotation:

The discipline "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 everyday life, elementary 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 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 Web pages and sites and publish materials on the Internet.

Educational Methods:

The course is held in lecture and computer rooms. The application of interactive teaching methods is envisaged. The lectures are richly illustrated with graphic material, which is presented with a video projector.

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.

FOREIGN LANGUAGE III

ECTS credits: 4	**Semester:** V
Evaluation: ongoing assessment	**Hours per week:** 3 seminar exercise
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.

Phone: +359-73-88 51 62

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.

<h1 align="center">OPERATION SYSTEMS</h1>

ECTS credits: 6	Semester: V
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. 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.

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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 Methods:

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.

SYNTHESIS AND ANALYSIS OF ALGORITHMS

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

Lecturer: Prof. Peter Milanov, PhD – **milanov@swu.bg**

Department: Informatics – informatics@swu.bg

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

Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.

PHONE: +359-73-88 51 62

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.

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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, 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: 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.

Phone: +359-73-88 51 62

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.

DIGITAL ELECTRONICS PROJECT

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.

Phone: +359-73-88 51 62

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.

CONVERSION EQUIPMENT AND POWER SUPPLY PROJECT

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.

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Annotation:
The course "Project of converting equipment 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.

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: Prof. Peter Milanov, PhD – **milanov@swu.bg**

Department: Informatics – informatics@swu.bg

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

Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.

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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

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: 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.

Phone: +359-73-88 51 62

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.

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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.

OPTICAL COMMUNICATION SYSTEMS

ECTS credits: 4	Semester: VI
Evaluation: exam	Hours per week : 2 Lectures + 1 Laboratories
Course type: lectures+ laboratory exercises	Course status : Compulsory
	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

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Annotation:

The training in the discipline includes the study of:

- Fundamentals of modern optical communication systems.

- Optical lines and networks. • Optical fibers and components.

- Optical transmitter and receivers.

Purpose of the course:

The aim of the course is for students to acquire knowledge about optical fibers and their basic parameters and characteristics, as well as the construction and types of optical cables. To get acquainted with the way of construction of the fiber-optic lines for transmission of digital information, with the passive and active elements, building these lines. To know the ways of production of these elements and the control of their parameters. Be able to design a linear path of an optical system for transmitting digital information.

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.

TECHNOLOGICAL PRACTICE II: DESIGN AND MANUFACTURE OF ELECTRONIC DEVICES

ECTS credits: 6	**Semester: VI**
Evaluation: ongoing	**Hours per week :** 3 Laboratories
Course type: laboratory exercises	**Course status :** Compulsory
	Degree course: Computer systems and technologies

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

Assistant: Assist. Eng Dinko Stoikov – dinkostoikov@swu.bg

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

Faculty: Faculty of Engineering – technical@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.

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Annotation:

The teaching material in the discipline Technological Workshop II: Design and manufacture of electronic devices is divided into three parts: the first relates to analog circuits, their purpose, parameters, research and replacement; the second - to digital circuits, the third introduces students to digitally controlled circuits - amplifiers, filters and others. 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, 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:

To acquaint students with analog and digital circuits, their implementation, testing and documentation.

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.

SENSORS AND SENSOR NETWORKS

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: 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.

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Annotation:

The course "Sensors and sensor networks" covers the main issues related to the characteristics, design and principle of operation of sensors, design and construction of sensor networks. Passed the exam in "Sensors and sensor networks" will acquire the necessary minimum of theoretical knowledge and practical skills in choosing sensors, as well as building wired and wireless sensor networks.

Purpose of the course:

The aim of the course "Sensors and sensor networks" is for students to gain a systematic knowledge of the physical nature and structure of sensors, the principles of operation, signal processing, construction of intelligent sensors and sensor networks. To get acquainted with the areas of application, the interfaces of the sensors and the criteria for their selection, to acquire practical skills for the incorporation of the sensors in systems for management and control of technological processes and monitoring of technological processes.

Educational Methods:

The course is held in lecture halls together with students majoring in "Electronics" and "Information and Communication Technologies" and "Computer Systems and Technologies".

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.

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

Assistant: Assoc. Prof. Dr. Ivan Nedyalkov - 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

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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 mandatory and is studied by all students majoring in Icomputer 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

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Assistant: Assist. Pavel Djunev – **djunev@swu.bg**

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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 seminars+2 laboratory exercises
Course type lectures and exercises	**Course status:** Elective **Degree course:** Information and communication 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

Phone. 073 88 51 62

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 is 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.

Phone: +359-73-88 51 62

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.

INTERNET TECHNOLOGIES

ECTS credits: 6	Semester: VII
Evaluation: written exam	**Hours per week : 1** Lectures + 2 Laboratories
Course type: lectures+	**Course status :** Compulsory

laboratory exercises	**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.

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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.

Phone: +359-73-88 51 62

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

COMPUTER NETWORKS

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.

Phone: +359-73-88 51 62

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	Hours per week : 2 Laboratories
Course type: laboratory exercises	Course status : Compulsory
	Degree course: Computer systems and technologies

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

Assistant: Assist. Eng Dinko Stoikov – dinkostoikov@swu.bg

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

Faculty: Faculty of Engineering – technical@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.

Phone: +359-73-88 51 62

Annotation:

The study material on the cource 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.

TELECOMMUNICATION TECHNOLOGY

ECTS credits: 6	Semester: VII
Evaluation: written exam	Hours per week : 2 Lectures + 1 Laboratories
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.
>
> *Phone:* +359-73-88 51 62

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

Lecturer: Assoc. Prof., Eng. Ivanka Georgieva, PhD – vanyakg@swu.bg

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

Faculty: Faculty of Engineering – technical@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.

Phone: +359-73-88 51 62

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.

Phone: +359-73-88 51 62

Annotation:

The course "Security and Monitoring Systems" introduces students to the methodology for designing security and monitoring systems for different purposes, at different sites and for different purposes. Students study the components for building security and monitoring systems, the requirements for their selection. The systematization of this knowledge makes it possible to move to practical work and design of these systems.

Purpose of the course:

The aim of the course "Security and Monitoring Systems" is for students to acquire knowledge about the goals, tasks, the physical nature of the engineering and technical means from which a security and monitoring system is built, the areas of application and the latest trends in construction. by replacing the cabling of the system with sensors and modules transmitting their information to each other via radio signals. Students are expected to acquire the ability for optimal selection of components for building video surveillance, security and monitoring systems. Individually or in a team to design and build security systems, video surveillance and monitoring systems.

Educational Methods:

The course is held in lecture halls together with students majoring in "Electronics" and "Information and Communication Technologies". They work in a team and individually. They research problems and present them.

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.

BASICS OF MOBILE COMMUNICATIONS

ECTS credits: 6	**Semester: VII**
Evaluation: written exam	**Hours per week : 2** Lectures + 1 Laboratories
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.

Phone: +359-73-88 51 62

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.

NETWORK AND INFORMATION SECURITY

ECTS credits: 4	**Semester: VII**
Evaluation: ongoing assessment	**Hours per week :** 2 Lectures **+1** Laboratories
Course type: lectures +laboratory exercises	**Course status :** Compulsory
	Degree course: Computer systems and technologies

Lecturer: Assoc. Prof., Eng. Ivanka Georgieva, PhD – vanyakg@swu.bg

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

Faculty: Faculty of Engineering – technical@swu.bg

Address: 2700 Blagoevgrad, 66 Ivan Mihailov str.

Phone: +359-73-88 51 62

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.

Phone: +359-73-88 51 62

Annotation:

The course "Network and Information security" introduces students to the methodology for designing security and monitoring systems for different purposes, at different sites and for different purposes. Students study the components for building security and monitoring systems, the requirements for their selection. The systematization of this knowledge makes it possible to move to practical work and design of these systems.

Purpose of the course:

The aim of the course "Network and Information Security" is for students to acquire knowledge about the regulations, the goals, tasks, technical means of building computer and communication systems, the relationship between different levels of communication in networks, technology and different techniques for acceptance. , data transmission and processing. Students to get acquainted with the possible cyber attacks, their ways of realization, to learn the methods for counteracting them. To be acquainted with the latest trends in counteracting cyber attacks and security methods in data transmission. To know different implementations of these methods, united by the ability to inform in case of an attack through a different way of notification.

Educational Methods:

The course is held in lecture halls together with students majoring in Computer Systems and Technologies. The exercises are damaged in a laboratory equipped with computers and specialized equipment.

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: Assoc. Prof. Nikolay Atanasov, PhD – **n**atanasov@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.

Phone: +359-73-88 51 62

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.

AUDIO SIGNAL PROCESSING AND CODING

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: 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.

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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 lectures + 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.

Phone: +359-73-88 51 62

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 lectures + 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.

Phone: +359-73-88 51 62

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 lectures + 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

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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.

COMPUTER MEASUREMENT SYSTEMS IN REAL TIME

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

Lecturer: Assoc. Prof., Eng. Anton Stoilov, PhD – antonstoilov@swu.bg

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Annotation:

The course "Embedded Systems" includes 15 generalized topics in the field of design and programming of specialized embedded computer systems with an emphasis on measurement. The content of the program covers the following main issues related to specialized embedded computer systems (Embeded Systems): basic characteristics and capabilities, design of measuring devices with these systems,

programming the operation of these systems, algorithms for processing data, application of embedded computer systems, etc.

Purpose of the course:

The aim of the course is for students to acquire knowledge and skills for: working with specialized computer systems for demolition (Embeded Systems) (eg Raspberry PI, etc .; development of computer applications in the field of measurement systems. Embeded Systems, including the application of modern technologies and methods for creating a complete computer product (device based on Embeded Systems, together with accompanying software for its work) Students to acquire knowledge for the application of modern programming methods and techniques in creation of modern computer devices and applications.

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.

UNDERGRADUATE DESIGN

ECTS credits: 6	**Semester:** VIII
Evaluation: ongoing assessment	**Hours per week:** 1 laboratory exercises
Course type: laboratory exercises	**Course status:** Compulsory
	Degree course: Computer systems and technologies

Lecturer: Assist. Prof. Dr. Eng. Ivan Todorin - ivan_todorin@gmail.com

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Annotation:

The discipline "Undergraduate Design" aims to prepare students for their upcoming graduation and is a learning process that allows students to connect the theoretical statements of the material studied and the acquired knowledge, skills and habits in practice with their application in the development of theses or their preparation for a state exam. Supports the entry of young professionals in the specifics of the upcoming work by mastering methodologies for creating production documentation and obtaining additional specialized training. Students get acquainted with the methodology for developing specific documents that serve the individual production processes, as well as the requirements they must meet. Last but not least, students get acquainted with the various ways, technologies and equipment for environmental protection, increasing the profitability of production and product quality.

Purpose of the course:

The course "Undergraduate Design" aims to form in students a professional approach to the chosen profession, namely:

- On the basis of theoretical knowledge to form skills and habits for the application of various development methods and technological approaches in computer technology;

- Building skills for solving various practical situations;

- Formation of a positive attitude towards the mastered profession;

- Formation of skills and habits for proper selection of the necessary methodologies, technological solutions, devices and devices for solving problems and new creative solutions in production and research, etc.

Educational Methods:

Students keep notes on the nature and essence of the methodologies for creating documents related to technological processes and operations. They work independently with company literature, catalogs and electronic resources of companies related to computer technology. Visions and ideas for possible optimization of certain devices and variants of their inclusion in the overall system are offered.

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 an oral discussion, 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.