

DESCRIPTION OF THE COURSE

Name of the course: Mathematics I	Code: MAT11	Semester: I
Type of teaching: Lectures (L) Tutorials (T)	Hours per semester: L – 45 hours T – 30 hours	Number of credits: 8

LECTURER(S):

Assoc. Prof. Albena Pavlova, PhD (FME), tel: 032 659652, e-mail: albena_pavlova@tu-plovdiv.bg
Chief Assist. Prof. Iva Naidevova, PhD (FME), tel.: 032 659651, e-mail: iva.naydenova@tu-plovdiv.bg
Chief Assist. Prof. Radoslava Terzieva, PhD (FME), tel.: 032 659651, e-mail: radoslavaterzieva@tu-plovdiv.bg

Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory subject from the curriculum for training of students to obtain Bachelor's degree, specialty “Automation, Information and Control Systems”, “Electrical Engineering”, “Design and programming of electronic systems” Professional orientation 5.2 Electrical Engineering, Electronics and Automation, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: Familiarization of students with basic questions in linear and Higher algebra, analytic geometry in the plane and three-dimensional space, the mathematical analysis necessary for application disciplines and subsequent mathematical disciplines.

DESCRIPTION OF THE COURSE: Main topics: Polynomials, actions with polynomials, of zeros of polynomials. Horner's rule and applications. Rational functions. Decomposition of fractional rational function of the sum of elementary fractions. Determinants – properties and to be somewhere. Minori and cofactor. Laplace theorem. Matrices, operations with matrices, elementary transformations, rank, inverse matrix, matrix equations. Curves from 2nd degree: circle, ellipse, parabola, hyperbola. Remarkable curves. Surfaces from 2nd degree. Familiarization of students with basic mathematical analysis questions: Limit, continuity, derivative and a differential of a function, the study of functions and applications. An indefinite integral, definite integral, Newton-Leibniz formula for calculation. Improper integrals. Series, function series and Fourier series..

PREREQUISITES: Good training in mathematics from high school.

TEACHING METHODS: Lectures and Seminars.

METHOD OF ASSESSMENT: Written examination.

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY:

1. Димова В., Стоянов Н., Висша математика I и II част, Техника, 1973.
2. Донеvски Б., Петров Л., Бижев Г., Линейна алгебра и аналитична геометрия, ТУ-София, 1997.
3. Топенчаров В. и колектив, Сборник от задачи по висша математика, част I, II, Техника, 1977.
4. Маринов М. и колектив, Задачи за упражнения по висша математика I, II 2006

DESCRIPTION OF THE COURSE

Name of the course: Physics	Code: PHY02	Semester: 1
Type of teaching: Lectures (L) Laboratory work (LW) Tutorials (T)	Hours per semester: L – 30 hours T – 30 hours LW – 15 hours	Number of credits: 8

LECTURER(S):

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Assist. Zara Kasapeteva PhD (FME), tel.: 032659 654, e-mail: zara_kasapeteva@tu-plovdiv.bg
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COURSE STATUS IN THE CURRICULUM: Compulsory subject from the curricula for training of students to obtain Bachelor's degree, specialties “Electrical Engineering”, “Design and programming of electronic systems” and “Automation, Information and Control Systems”, Professional orientation 5.2 Electrical Engineering, Electronics and Automation, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The aim of the course of Physics is to acquaint the students with the physical phenomena and processes, the methods of their studying and the possibilities for their technical application. The obtained theoretical knowledge and practical skills are a prerequisite for development and formation of independent thinking and ability to solve a variety of real physical problems.

DESCRIPTION OF THE COURSE: The topics, included in the course of Physics comprise basic physical laws and values, describing the most general properties of matter from the point of view of classical mechanics. The content of the course is organized in the following chapters: Mechanics, Molecular physics, Thermodynamics, Electrostatics, Electric current, Electromagnetism, Vibrations, Waves in an elastic medium, Acoustics, Geometric and wave optics, Quantum properties of matter, Atomic physics. The main physical laws are considered by means of using classical models, allowing for accurate description of real processes. Computer technique along with information technologies are used where needed in combination with appropriate measurement devices. The use of the international measurement system SI is indispensable and compulsory part of the course. The basic knowledge given by this course is further needed both for the specialized courses and for the professional preparation of the students.

PREREQUISITES: Prerequisites for successful mastering the material in the course of Physics - are good knowledge of the material in Physics and Mathematics form secondary school and certain elements from the courses in Mathematics (Calculus).

TEACHING METHODS: Lectures for acquaintance with the theoretical material, laboratory work for obtaining practical skills, as well as for systematization and processing of the measurement results. The seminary exercises help to apply theoretical knowledge to solve specific tasks (only for students majoring in Mechatronics).

METHOD OF ASSESSMENT: Written examination (test), complex assessment made up of 80% from the test result and 20% from the performance during laboratory work and seminar exercises.

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY: 1. И.П. Илиев. Физика (I и II част). Издателство „Екс-прес“, 2018; 2. И.П. Илиев. 144 решени задачи по физика. Издателство „Екс-прес“, 2018; 3. Савалев И.В “Курс по обща физика” I,II,III т. изд. “Наука”, Москва 1973 г.; 4. С.Йорданов, Физика 1. ЕКС-ПРЕС,2006; 5. И.Вълков, Физика в “Задачи I”, “Макрос” Пловдив, 2012; 6. И.Вълков,

Е.Георджева и др. “Лабораторен практикум по физика “ЕКС-Прес”, Габрово, 2010; 7. Д.Христозов и др., Лабораторен практикум по физика, изд. Наука и изкуство, 1990; 8. Т.Трофимова. Курс по физика. Изд. На СУ“Кл.Охридски” 1995; 9. М.Максимов. Основи на физиката. Част 1,2 София 2000; 10.С.Дамянов. Сборник от задачи по физика.Изд.“Наука и изкуство“ София 1987; 11. Савалев И.В “Курс по обща физика” I,II,III т. изд. “Наука”, Москва 1973 г.; 12. С.Йорданов, Физика 1. ЕКС-ПРЕС,2006; 13. И.Вълков, Физика в “Задачи I”, “Макрос” Пловдив, 2012; 14. Д.Христозов и др., Лабораторен практикум по физика, изд. Наука и изкуство, 1990; 15. Н.Илков, С.Николов, Физика част 1, София, 2003.

DESCRIPTION OF THE COURSE

Name of the course: Chemistry	Code: CHE02	Semester: 1
Type of teaching: Lectures (L) Laboratory work (LW)	Hours per semester: L – 15 hours LW – 30 hours	Number of credits: 5

LECTURER(S):

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COURSE STATUS IN THE CURRICULUM: Compulsory subject from the curricula for training of students to obtain Bachelor's degree, specialties "Electrical Engineering", "Design and programming of electronic systems" and "Automation, Information and Control Systems", Professional orientation 5.2 Electrical Engineering, Electronics and Automation, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: To give basic knowledge about construction materials - metals, their alloys, polymers and other composites, by showing the relationship between the chemical composition, structure and properties. To study general regularities in the electrochemical and chemical conduct of metals in relation to the corrosion problem and its resolve. To provide theoretical and technological knowledge of basic chemical and electrochemical processes used in aircraft industry.

DESCRIPTION OF THE COURSE: The main chemical and physical properties of metals are discussed. Theoretical knowledge of electrochemical systems – electrode, electrolytic cell and galvanic cell are given. Students learn the theory of electrode potential and electrolysis processes, the kinetics of electrode reactions, and electrode over potential. Presented are the modern electrochemical sources of electric power (primary cells, batteries and fuel cells). An essential part of the course focuses on the mechanisms of corrosion processes and factors affecting their conduct, and the main methods and technologies for corrosion protection. This includes the basic knowledge of polymers - polymerization and polycondensation products, elastomers and inorganic polymers. The chemical composition, structure and properties of composite materials based on them – plastics, rubber composites, technical ceramics and cermets are studied.

PREREQUISITES: The knowledge of chemistry from the secondary school.

TEACHING METHODS: Lectures and laboratory works with protocols..

METHOD OF ASSESSMENT: Written exam.

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY: 1. Демирев А. Практикум по химия. УИ П. Хилендарски, Пловдив, 2014; 2. Бетова И., И. Попова. Химия.ГУ - София, София, 2010; 3. Панайотов И., С. Факиров. Химия и физика на полимерите. УИ Св. Климент Охридски, София, 2005; 4. Райчев Р. Корозия и защита на материалите. Нови знания, София, 2000; 5. Петров Х., М. Енчева. Химия. Техника, София, 1994; 6. Ненов И. Теоретична електрохимия. Техника, София, 1991; 7. Ганчева Т., Е. Добрева., И. Яначкова. Ръководство за лабораторни упражнения по химия. Наука и изкуство, София, 1990; 8. Велева М., П. Копчев, К. Обрешков. Химия. Наука и изкуство, София, 1987; 9. Ганчева Т. Структура и свойства на конструкционите полимерни материали. Техника, София, 1982.

DESCRIPTION OF THE COURSE

Name of the course: Engineering Graphics	Code: ENG06	Semester: 1
Type of teaching: Lectures (L) Laboratory work (LW) Course work (CW)	Hours per semester: L – 15 hours LW – 45 hours	Number of credits: 6

LECTURER(S):

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COURSE STATUS IN THE CURRICULUM: Compulsory subject from the curricula for training of students to obtain Bachelor's degree, specialties “Automation, Information and Control Systems”, “Electrical Engineering”, “Design and programming of electronic systems”, Professional orientation 5.2 Electrical engineering, electronics and automation, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The Engineering Graphics course aims to develop students' spatial thinking and technical culture. It provides the necessary minimum of knowledge in reading the images of electrical products in technical drawings. The student acquires knowledge and skills by making drawings and text documents of the products in compliance with all important requirements of the standards in this field.

DESCRIPTION OF THE COURSE: The main topics concern: Basic positions of the graphical representation of geometric objects on a plane. Types of design. Monge design. Representation of a point, line and plane. Mutual position of geometric objects. Transformation of projections. Depiction of lines, surfaces and bodies. Plain sections. Intersection of surfaces and bodies. Axonometric design. Standardization of graphic information. Technical drawings. Basic graphic symbols in electrical circuits. Methods for displaying details and assembled units are covered. The principles and methods of geometric and functional sizing of the products are considered. Students will acquire skills for developing and reading a drawing of an electrical product, as well as for the implementation of the basic documents of a set of design documentation. More in-depth skills are created for the application of the current CAD systems in the automated execution of a detailed and assembled drawing of a set of documentation.

PREREQUISITES Knowledge and methods are used in the discipline "Mathematics" on the basis of which methods are developed for solving problems in the field of applied geometry and engineering graphics.

TEACHING METHODS: Lectures, using slides, case studies, laboratory and course work in the field of applied geometry are solved.

METHOD OF ASSESSMENT: Current assessment of course work.

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY: 1. Спиридонов, Търновска, Хубанова, Лепаров, (1988), Ръководство за упражнения по техническо чертане и стандартизация за електротехническите специалности, Държавно издателство "Техника", София; 2. Сандалски Б., П. Горанов, Г. Динев, И. Николова Основи на конструирането и CAD, София, Софттрейд, 2008; 3. Туджаров Б., Е. Тодорова, Д. Колева, М. Янчева “Ръководство за упражнения и курсова работа по Основи на конструирането и CAD I, София, СОФТТРЕЙД, 2008; 4. Dassault Systèmes, SolidWorks Corporation, Waltham, MA 02451 U.S.A. Fundamentals of SolidWorks

electrical, Solidworks education edition 2016-2017; 5. Ruiz, P., & Dorronsoro, B. (2019). A Novel CAD Tool for Electric Educational Diagrams. *Applied Sciences*, 9(4), 810. 6. Panova, E. A., Varganova, A. V., & Panarina, M. S. (2019, September). Automation of the process of electrical substations design through the development and application of CAD when choosing electrical equipment. In *2019 International Russian Automation Conference (RusAutoCon)* (pp. 1-4). IEEE. 7. Panova, E. A., Varganova, A. V., & Patshin, N. T. (2019, September). CAD in Electrical Engineering: New Approaches to an Outdoor Switchyard Design. In *International Russian Automation Conference* (pp. 536-544). Springer, Cham.

COURSE DESCRIPTION

Course Title: Foreign Language I	Code: LNG01	Semester: 1
Type of Teaching: Seminars (S)	Contact hours per semester: S – 30 hours	Number of credits: 2

LECTURERS:

Sen. Lect. Konstantina Nyagolova (FME, English)

Sen. Lect. Nadya Popova (FME, English)

Sen. Lect. Anet Arabadjieva (FME, English)

Sen. Lect. Nadezhda Geshanova (FME, English)

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COURSE STATUS IN THE CURRICULUM: Compulsory course in the curriculum of the *Bachelor Degree Programme in Electrical Engineering*, Professional qualification 5.2 Electronics, Electrical Engineering and Automation, Professional field 5 Technical Sciences.

COURSE OBJECTIVES: The course is targeted at further developing of students' language knowledge and practical skills in their specific professional field.

COURSE DESCRIPTION: The course is taught at language levels determined through placement tests, based on the principal foreign language studied at secondary school. No absolute beginner groups are formed. The course focuses on the further development of the four language skills in the domain of the students' major subject *Electrical Engineering*.

PREREQUISITES: The minimum of language knowledge and skills acquired at secondary school.

TEACHING METHODS: Seminars targeted at further development of the four language skills through individual and team work using audio and video, as well as multimedia.

METHOD OF ASSESSMENT: Evaluation is based on continuous assessment and students get a grade at the end of the semester.

LANGUAGE OF INSTRUCTION: English

LITERATURE RECOMMENDED:

1. *English Vocabulary in Use*, Michael McCarthy, Felicity O'Dell, Stuart Redman, Cambridge University Press
2. *Technical English*, Pearson Longman
3. *English for Electrical Engineering in Higher Education Studies*, Roger H. C. Smith, Garnet Publishing Ltd.
4. *English for Electronics*, Oxford University Press
5. *Flash on English for Mechanics, Electronics and Technical Assistance*, Sabrina Sopranzi

DESCRIPTION OF THE COURSE

Name of the course: Sport	Code: SPR01	Semester: 1
Type of teaching: Lectures (L) Laboratory work (LW)/Seminars (S) Self-Study (SS)	Hours per semester: L – 0 hours S – 0 hours SS – 30 hours	Number of credits: 1

LECTURER(S):

Sen. Lect. Daniel Vladimirov, PhD (FEA), tel.: 032 659 646, e-mail: danielv@tu-plovdiv.bg

Sen. Lect. Petar Doganov, PhD (FEA), tel.: 032 659 648, e-mail: pdoganov@tu-plovdiv.bg

Sen. Lect. Boris Spasov, PhD (FEA), tel.: 032 659 647, e-mail: boris_spasov@tu-plovdiv.bg

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COURSE STATUS IN THE CURRICULUM: Compulsory subject from the curricula for training of students to obtain Bachelor's degree, specialty “Automation, Information and Control Systems”, “Electrical Engineering”, “Electronics” Professional orientation 5.2 Electrical Engineering, Electronics and Automation, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: Targeted at further developing of students' physical activities, skills and hygiene habits through effective methods of physical education, improving their mental and physical performance.

DESCRIPTION OF THE COURSE: The knowledge and skills in Physical Education and Sports develop a wide range of motor skills and habits, help the hardening of the body and contribute to the moral development of students. The enhancement of physical skills is carried out through:

1. General Physical Preparedness (GPP) – in these seminars the students develop a wide range of motor skill and habits; work to improve strength, speed, endurance, flexibility, structure and skill; increase resistance to unfavourable environmental factors; develop their physical qualities and experience.
2. Sports-Specific Physical Preparedness (SPP) – students improve their sport skills and habits in a specific sport and gain experience through participation in competitions; work to improve strength, speed, endurance, flexibility, structure and skill; increase resistance to unfavourable environmental factors; develop their physical qualities and experience.

PREREQUISITES: The curricula presume the minimum of knowledge and skills acquired at secondary school.

TEACHING METHODS: Seminars in accordance with the curriculum in PE and Sport.

METHOD OF ASSESSMENT: Evaluation is based on functional tests at the end of semester. Lecturer's signature is required at the end of semester and “Pass grade”.

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY: 1. Владимиров В. Туризм и ориентиране. Методическо ръководство за студентите от ТУ София, филиал Пловдив. Издателство на ТУ - София. 2010.

DESCRIPTION OF THE COURSE

Name of the course: Mathematics II	Code: MAT21	Semester: II
Type of teaching: Lectures (L) Tutorials (T)	Hours per semester: L – 45 hours T – 30 hours	Number of credits: 7

LECTURER(S):

Assoc. Prof. Albena Pavlova, PhD (FME), tel: 032 659652, e-mail: albena_pavlova@tu-plovdiv.bg
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Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory subject from the curricula for training of students to obtain Bachelor's degree, specialties Automation, Information and Control Systems, Electrical Engineering, Design and programming of electronic systems, Professional orientation 5.2 Electrical Engineering, Electronics and Automation, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: Familiarization the students with basic parts of the mathematical analysis and neighbour mathematical disciplines necessary for application disciplines.

DESCRIPTION OF THE COURSE: Main topics: Ordinary differential equations with separable variables. Basic types first order ODE; Linear differential equations from second and higher order with constant coefficients; Functions of two and more variables – limit of the function, partial derivatives, differential, extrema. Double, triple, linear integrals and integrals on surface. Some notions and basic theorems from the field theory. Theorems of Green, Gauss and Stokes. Theorem for the independence of the integral from the path. Series. Function of one complex variable. Cauchy-Riemann conditions (equations), conformal mapping. Integration in the complex domain – linear integral, Cauchy integral theorem, Cauchy integral formula and formula for derivatives. Classification of the isolated singularities and definition of Laurent series and residues. Theorem for the residues. Application of residues to evaluation of real integrals; Foundations of the operational calculus – Laplace transform – basic properties and theorems. Applications – solving some classes differential equations.

PREREQUISITES: Very good training in Mathematics I (MAT12).

TEACHING METHODS: Lectures and Seminars.

METHOD OF ASSESSMENT: Written examination.

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY:

1. Колектив на ИПМИ, Висша математика, части II, III и IV, Техника, 1986.
2. Колектив на ИПМИ, Избрани глави от математиката, Модули I – V, Печатна база ТУ– София, 1993.
3. Колектив на ИПМИ, Сборник от задачи по висша математика, части II, III и IV Техника, 1979.

DESCRIPTION OF THE COURSE

Name of the course: Electrical materials	Code: EEA01	Semester: 2
Type of teaching: Lectures (L) Laboratory work (LW)	Hours per semester: L – 30 hours LW – 30 hours	Number of credits: 5

LECTURER(S):

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Assoc. Prof., PhD Stanimir Stefanov, tel.: 032 659 512, e-mail: glasst@tu-plovdiv.com,
Technical University of Sofia, Branch Plovdiv, Faculty of Electronics and Automation,
Department of Electrical Engineering.

COURSE STATUS IN THE CURRICULUM: Compulsory course from the curriculum for training students for Bachelor's degree, specialty "Electrical Engineering", professional field 5.2 General Engineering, field 5. Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The aim of the course is to introduce students to the methods and tools for measuring the characteristics of the types of electrical materials in accordance with the requirements of BDS and relevant international standards. Methods for quality control and reliability of insulation systems.

DESCRIPTION OF THE COURSE: The subject Electrical materials presents the behavior of the various types electrical engineering materials in the electrical and magnetic field and the processes taking place within them.

PREREQUISITES: The subject is based on knowledge of Physics, Chemistry and Mathematics.

TEACHING METHODS: Lectures held by the lecturer and aided by presentations. Laboratory exercises are performed under the guidance of an assistant professor. The students should compile protocols as a result of their activities during the exercises.

METHOD OF ASSESSMENT: Written exam at the end of the second semester (90%) and summarized assessment from laboratory exercises (10%).

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY: 1. Генчев М., "Електротехнически материали", електронен учебник, ISBN 978-954-2937-07-4, e-book, <http://elrn.tu-plovdiv.bg/microsoftclassserver>, 2010.

2. Генчев М. "Електроматериалознание", учебник, ISBN 978-954-8779-99-9, Дъга принт ООД, Пловдив, 2011.

3. Генчев М. "Ръководство за лабораторни упражнения по електроматериалознание", ISBN 978-954-8779-98-2, Дъга принт ООД, Пловдив, 2011

4. Тодорова А., Г.Дюстабанов, М.Генчев, "Ръководство по материалознание", ISBN 954-438-102-3, Издателство на ТУ София, 1994.

5. Генчев М., "Ръководство за лабораторни упражнения по електротехнически материали", електронен учебник, ISBN 978-954-2937-06-7, e-book, <http://elrn.tu-plovdiv.bg/microsoftclassserver>, 2009.

DESCRIPTION OF THE COURSE

Name of the course: Programming 1	Code: CCE26	Semester: 2
Type of teaching: Lectures (L) Laboratory work (LW) Course work	Hours per semester: L - 30 LW - 30	Number of credits: 5

LECTURER:

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Technical University of Sofia, Branch Plovdiv

COURSE STATUS IN THE CURRICULUM: Compulsory training course from the bachelor's program specialty "Electrical engineering", direction 5.2. "Electrical engineering, electronics and automation" of the Technical University of Sofia, Plovdiv branch.

AIMS AND OBJECTIVES OF THE COURSE IS: for students to learn and be able to apply the approaches, methods, and technical means for analysis, design, and programming of software applications to solve a wide range of practical problems using a basic programming language. The main task of the discipline is to achieve in-depth knowledge and skills for efficient use of memory and effective structuring of data with the help of the basic programming language C. At the end of his studies, the student will: be able to use a high level of programming, bit-by-bit operations; will have professional skills for efficient memory use, using address pointers and appropriate composite data types; will be able to work with character strings; will be familiar with the dynamic data structures list, stack, queue, ordered binary tree, graph; will be familiar with the basic operations on them and some of their applications.

DESCRIPTION OF THE COURSE: Some main topics are Data types. Static data structures. Conditional operators. Loop operators. Functions. Address pointers. One-dimensional arrays, Two-dimensional arrays. Compiler. Macros. Preprocessor. Bit-by-bit operations. Bitwise operations. String processing. String length. Copy string. Search for a sub-string in a string. Merge character strings. Comparing strings. Compound data types. Data structures. Structures in C language; Dynamic implementation of a list. Relationship with pointers and arrays; List; Stack; Tail; Basic operations: element inclusion, traversal, element deletion; ordered binary tree. Definition and spheres of application; Basic operations in an ordered binary tree: search by a given key; inclusion of a new vertex, exclusion of a vertex by a given key, traversal; Graphs; Basic notions; Representation with neighborhood matrix and simple operations with a graph; Graph traversal.

PREREQUISITES: knowledge of mathematics and computer science from the high school.

TEACHING METHODS: Lectures, laboratory exercises, and coursework on basic topics.

METHODS OF ASSESSMENT: This is a current assessment. The grade is formed by the results of two tests and the grade from the coursework. The two controls have a weighting factor of 0.4, and the grade from the coursework has a weighting factor of 0.2.

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY:

1.Reema Thareja, Data Structures Using C 2nd Edition, ISBN-13: 978-0198099307, ISBN-10: 0198099304, **Oxford University Press**; 2nd edition (October 13, **2018**). 2. П. Наков, П. Добриков, Програмиране=++Алгоритми;, Top Team Co, София, **2002**. 3. Хърбърт Шилдт, Практически самоучител, Най-успешният и доказан метод за научаване на C, Софтпрес, 2001.4. Б. Кернинган, Д. Ритчи, Програмен език C, Prentice Hall, 2002. 5. Data Structures - Full Course Using C and C++; freeCodeCamp.org <https://www.youtube.com/watch?v=B31LgI4Y4DQ>

DESCRIPTION OF THE COURSE

Name of the course: Mechanics	Code: MEC22	Semester: 2
Type of teaching: Lectures (L) Seminars (S)	Hours per semester: L – 30 hours S – 30 hours	Number of credits: 5

LECTURER(S):

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Assist. Prof. Eng. Ivanka Delova (FME), tel.: 0898960191, e-mail: ivankadelova@tu-plovdiv.bg
Technical University of Sofia, Branch Plovdiv

COURSE STATUS IN THE CURRICULUM: Compulsory facultative subject from the curriculum for training students for Bachelor's degree, specialties "Electrical Engineering" and "Automation, Information and Control Engineering", professional field 5.2 Electrical Engineering, Electronics and Automation, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: The course builds engineering and technical culture in students and develops knowledge and skills for independent work and engineering assessment of various types of technical problems. The seminars expand the practical knowledge and skills in the studied discipline.

DESCRIPTION OF THE COURSE: The Main topics concern: Basic concepts and objects; Forces and actions with them; kinematics of particles, mechanical system and ideal rigid body; Mechanisms and computation of the degrees of freedom; Geometric characteristics of bodies; Determination of internal forces and sizing of bodies; Machine dynamics.

PREREQUISITES: Mathematics, Technical documentation.

TEACHING METHODS: Lectures, using slides. The seminars are presented in a classic version.

METHOD OF ASSESSMENT: Written exam at the end of the semester.

BIBLIOGRAPHY:

1. Ts. Nedev, V. Galabov, A. Lilov and A. Andonov, "Mechanical Engineering", Softtrade 2002
2. V. Galabov, R. Dolchinkov and N. Nikolov, "Mechanical Engineering", Irita, 2005.
3. I. Ivanov, "Technical Mechanics", Hristo G. Danov, 1974.
4. Neil Sclater and Nicholas P. Chironis, "Mechanisms and Mechanical Devices Sourcebook" (Fourth Edition), McGraw-Hill Companies, 2007.

DESCRIPTION OF THE COURSE

Name of the course Technical Safety	Code: EEA02	Semester: 2
Type of teaching: Lectures and laboratory work	Hours for the semester: L– 30 hours; LW – 15 hours	Number of credits: 5

LECTURER:

Assoc. Prof. Eng. Margarita Deneva, Department of Electrical Engineering (FEA) tel.: (032) 659 759; email: deneva@tu-plovdiv.bg , Technical University of Sofia, Branch Plovdiv

Ass. Eng. Mincho Velkov, Department of Electrical Engineering (FEA) tel.: (032) 659 512; email: mincho.velkov@tu-plovdiv.bg , Technical University of Sofia, Branch Plovdiv

COURSE STATUS IN THE CURRICULUM: Compulsory course for students from the 5.2. "Electrical Engineering, Electronics and Automation", specialties Electrical Engineering, Design and Programming of Electronic Systems, Automation, information and control technology.

AIMS AND OBJECTIVES OF THE COURSE: Acquisition of basic knowledge by students on the basic requirements, methods and measures to ensure safety at work in the conditions of modern technological progress, for the analysis and assessment of risk at work; the knowledge provides the opportunity to assess, take measures to prevent risk in activities in their professional future field and adequate reaction to accidents and occupational accidents; in accordance with their needs and interests students can acquire new knowledge and opportunities in this subject area.

DESCRIPTION OF THE COURSE: The training process focuses on ensuring technical safety at work in various conditions and facilities, occupational health and safety management, workplace risk analysis and assessment, work environment factors considered in the context of current technical legislation and applicable standards. The exercises complete the topics covered in terms of practical application of the knowledge gained from lectures and self-study.

PREREQUISITES: basic knowledge in the fields of Physics, Mathematics, Chemistry, Materials Science, Electrical Engineering.

TEACHING METHODS: Lectures, delivered mainly using a multimedia projector, laboratory exercises are prepared with appropriate models and finished with protocols.

METHOD OF ASSESSMENT: Final assessment consisting of three components: a basic end-of-semester final test and one mid-semester mid-term test for the material learned so far with weights of 0.5 and 0.3, respectively, and laboratory grade of 0,2.

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY: Literature is mainly provided by the lecturer under the form of lecture notes in electronic or printed format, selected appropriately for the topics of the lectures and exercises.

1. И. Иванов, П. Петров, Г. Велев, Н. Петрок, „Техническа безопасност“, София– учебник за ТУ-София и ТУ-Габрово (2011)
2. Мария Хасъмска, „Сборник инструкции за безопасност и здраве при работа“, ИК Труд и право“, ISBN 9789546082435 (2016)
3. М. Йорданова, Техническа безопасност, ISBN 978-619-221-326-8, МУ Варна, 2021
4. М. Денева, „Техническа безопасност“, Издателство на Техническия Университет –София, ISBN: 978-619-167-451-0 (2021)
5. М. Денева, М. Ненчев, „Лазерното лъчение в интерпретация за инженери и приложници“, Интелексперт’94, (2013)
6. „Закон за здравословни и безопасни условия на труд“, Обн. ДВ. бр.124 от 23 Декември 1997г., с последващи изменения и допълвания, последно изм. и доп. ДВ. бр.97 от 5 Декември 2017г.

DESCRIPTION OF THE COURSE

Name of the course: Practicum	Code: PRC01	Semester: 2
Type of teaching: Out-of-classroom activities (OCA)	Hours per semester: OCA - 60 hours	Number of credits: 2

LECTURER(S):

Assoc. Prof. Eng. Ivan Hadzhiev, PhD (FEA), tel.: 032 659-686,
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Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory subject from the curriculum for training of students to obtain Bachelor's degree, specialty Electrical Engineering, Professional orientation 5.2 Electrical Engineering, Electronics and Automation, Field 5. Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: After completion of the course the students acquire knowledge about the main types, designs, and characteristics of electrical machines and apparatus, as well as the technology of their production.

DESCRIPTION OF THE COURSE: Main topics: Designs, characteristics, and operating principles of synchronous, asynchronous (induction) machines, and direct current (DC) machines; Technology of manufacturing magnetic and electrical insulation systems of electrical machines; Technology of manufacturing windings for electrical machines; Assembly of electrical machines; Designs, characteristics, and operating principles of circuit breakers, disconnectors, fuses, motor protection circuit breakers and residual current circuit breakers (RCCBs); Designs, characteristics, and operating principles of contactors and relays; Technology of manufacturing magnetic and electrical insulation systems for electrical apparatus; Technology of manufacturing conductive systems for electrical apparatus; Assembly of electrical apparatus.

PREREQUISITES: Mathematics, Physics, Theoretical Electrical Engineering, Electrical materials.

TEACHING METHODS: The lecturer familiarizes students with the subject matter of the course. Students develop the topics of the course during their independent study hours. At the end of the semester, each student submits the topics they have developed.

METHOD OF ASSESSMENT: The practicum concludes with a continuous assessment, which the student receives after completing and defending topics related to the subject.

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY: 1. Dinov V., St. Shishkova, Electrical Machines Part I, Academic Publishing House of the Agricultural University of Plovdiv, 2002; 2. Dinov V., Shishkova St. Electrical Machines Part II, Plovdiv, Academic Publishing House of the Agricultural University, 2004; 3. Voldyck A. Electrical Machines, Sofia, Tekhnika, 1978; 4. Alexandrov A., Electrical Apparatus - Part I, Electromagnetic and Thermal Issues, Heron Press, Sofia, 2002; 5. Alexandrov A., I. Yachev, Electrical Apparatus - Part II, Switching and Insulation Issues, Avangard Prima, Sofia, 2010; 6. Maslarov I., Electrical Apparatus, Sofia, Avangard Prima, 2013; 7. Kупenov D., Technology of Electrical Machines and Apparatus Part I, Tekhnika, Sofia, 1993; 8. Daskalov V., Technology of Electrical Machines and Apparatus, S., Publishing House of the Technical University, 1997).

DESCRIPTION OF THE COURSE

Name of the course: Sport	Code: SPR02	Semester: 2
Type of teaching: Lectures (L) Laboratory work (LW)/Seminars (S) Self-Study (SS)	Hours per semester: L – 0 hours S – 0 hours SS – 30 hours	Number of credits: 1

LECTURER(S):

Sen. Lect. Daniel Vladimirov, PhD (FEA), tel.: 032 659 646, e-mail: danielv@tu-plovdiv.bg

Sen. Lect. Petar Doganov, PhD (FEA), tel.: 032 659 648, e-mail: pdoganov@tu-plovdiv.bg

Sen. Lect. Boris Spasov, PhD (FEA), tel.: 032 659 647, e-mail: boris_spasov@tu-plovdiv.bg

Technical University of Sofia-Branch Plovdiv

Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory subject from the curricula for training of students to obtain Bachelor's degree, specialty “Automation, Information and Control Systems”, “Electrical Engineering”, “Electronics” Professional orientation 5.2 Electrical Engineering, Electronics and Automation, Field 5 Technical Sciences.

AIMS AND OBJECTIVES OF THE COURSE: Targeted at further developing of students' physical activities, skills and hygiene habits through effective methods of physical education, improving their mental and physical performance.

DESCRIPTION OF THE COURSE: The knowledge and skills in Physical Education and Sports develop a wide range of motor skills and habits, help the hardening of the body and contribute to the moral development of students. The enhancement of physical skills is carried out through:

1. General Physical Preparedness (GPP) – in these seminars the students develop a wide range of motor skill and habits; work to improve strength, speed, endurance, flexibility, structure and skill; increase resistance to unfavourable environmental factors; develop their physical qualities and experience.
2. Sports-Specific Physical Preparedness (SPP) – students improve their sport skills and habits in a specific sport and gain experience through participation in competitions; work to improve strength, speed, endurance, flexibility, structure and skill; increase resistance to unfavourable environmental factors; develop their physical qualities and experience.

PREREQUISITES: The curricula presume the minimum of knowledge and skills acquired at secondary school.

TEACHING METHODS: Seminars in accordance with the curriculum in PE and Sport.

METHOD OF ASSESSMENT: Evaluation is based on functional tests at the end of semester. Lecturer's signature is required at the end of semester and “Pass grade”.

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY: 1. Владимиров В. Туризм и ориентиране. Методическо ръководство за студентите от ТУ София, филиал Пловдив. Издателство на ТУ - София. 2010.

COURSE DESCRIPTION

Course Title: Foreign Language II	Code: FaLNG21	Semester: 2
Type of Teaching: Seminars (S)	Contact hours per semester: S – 30 hours	Number of credits: 2

LECTURERS:

Sen. Lect. Konstantina Nyagolova (FME, English)

Sen. Lect. Nadya Popova (FME, English)

Sen. Lect. Anet Arabadjieva (FME, English)

Sen. Lect. Nadezhda Geshanova (FME, English)

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COURSE STATUS IN THE CURRICULUM: Optional course in the curriculum of the *Bachelor Degree Programme in Electrical Engineering*, Professional qualification 5.2 Electronics, Electrical Engineering and Automation, Professional field 5 Technical Sciences.

COURSE OBJECTIVES: The course is targeted at further developing of students' language knowledge and practical skills in their specific professional field.

COURSE DESCRIPTION: The course is taught at language levels determined through placement tests, based on the compulsory foreign language course taken in Semester 1 at TU – Sofia. No absolute beginner groups are formed. The course focuses on the further development of the four language skills in the domain of the students' major subject *Electrical Engineering*.

PREREQUISITES: Completed compulsory foreign language course **LNG01** in Semester 1.

TEACHING METHODS: Seminars targeted at further development of the four language skills through individual and team work using audio and video, as well as multimedia.

METHOD OF ASSESSMENT: Evaluation is based on continuous assessment and students get a grade at the end of the course.

LANGUAGE OF INSTRUCTION: English

LITERATURE RECOMMENDED:

1. *English Vocabulary in Use*, Michael McCarthy, Felicity O'Dell, Stuart Redman, Cambridge University Press
2. *Technical English*, Pearson Longman
3. *English for Electrical Engineering in Higher Education Studies*, Roger H. C. Smith, Garnet Publishing Ltd.
4. *English for Electronics*, Oxford University Press
5. *Flash on English for Mechanics, Electronics and Technical Assistance*, Sabrina Sopranzi