

DESCRIPTION OF THE COURSE

Name of the course Higher Mathematics I	Code: BCSCe02	Semester: 1
Type of teaching: Lectures and Seminar exercises	Lessons per week: L –3 hours, SE – 2 hours	Number of credits: 6

LECTURER:

Assoc. Prof. Dr. Snejanka D. Donevska (FAM), tel.: 02965-2356, e-mail: snejanka_bd@yahoo.co.uk
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory course in English for the students in the Bachelor Degree Programme on Computer Science and Engineering of the Faculty of Computer Systems and Technologies, Department of Computer Science

AIMS AND OBJECTIVES OF THE COURSE: To develop students' competence and confidence to handle mathematical methods relevant to engineering. The emphasis is on the development of the student's ability to use mathematics with understanding, to solve engineering problems effectively and to help understanding Further Mathematics Courses and other Engineering Subjects.

DESCRIPTION OF THE COURSE: To achieve the desired objectives the course covers appropriate topics of Mathematics for undergraduate courses in all engineering disciplines: Complex Numbers, Polynomials, Matrices and their Applications, Function of one Variable – Limits, Continuity, Derivatives and Applications, Indefinite Integrals – Rules and Basic Integrating Technics, Applications of Integral Calculus, Infinite Series with nonnegative terms, Alternating Series, Absolute and Conditional Convergence.

PREREQUISITES: High School Mathematics, Mathematics Part I, Physics

TEACHING METHODS: Lectures and seminars: traditional mode; application of software packages; digital projector

METHOD OF ASSESSMENT: One 2-hour midterm assessment and one 2-hour assessment at the end of semester (total 30%); written examination at the end of semester (70%).

INSTRUCTION LANGUAGE: English

BIBLIOGRAPHY:

1. Donevska S., B. Donevsky, Calculus and Analytic Geometry, Math I, Part 1, TU, 2013.
2. Donevska S., B. Donevsky, Calculus and Analytic Geometry, Math I, Part 2, TU, 2010.
3. Donevska S., B. Donevsky, Calculus and Analytic Geometry, Math I, Part 3, TU, 2011.
4. Howard Anton, I. Bivens, St. Davis, Calculus, 10th Edition, 2012.
5. Tan S. T., Applied Calculus, 6th Edition, 2009.
6. Stewart J., Single Variable Calculus, Early Transcendental, 7th Edition, 2012.
7. O'Neil P. V., Advanced Engineering Mathematics, 7th Edition, 2012.
8. Hass J., M. D. Weir, G. B. Thomas, Jr., University Calculus, 2011.

DESCRIPTION OF THE COURSE

Name of the course: Algorithm Design and Analysis	Code: BCSCe03	Semester: 3
Type of teaching: Lectures and laboratory work	Lessons per week: L – 2 hours; LW – 2 hour	Number of credits: 5

LECTURER:

Prof. Ognyan Nakov Nakov Ph.D. (FCST) – tel.: 965 3513, email: nakov@tu-sofia.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory for students speciality “Computer Science and Engineering” – bachelor degree (Faculty of Computer Systems and Technologies of TU-Sofia).

AIMS AND OBJECTIVES OF THE COURSE: Development of basic knowledge for algorithm synthesis and analysis. Main group of algorithms are estimated: numbers manipulation, sorting, searching, hashing, tree structures evaluations, recursions, lists, graphs etc.

DESCRIPTION OF THE COURSE: Theory of algorithms, problem and algorithm analysis and looking for optimal decision are the topics of the course. The discussion is centred in: sort algorithms, searching, recursion, lists, graphs, hashing. Practical work is involved for individual development of algorithm and program synthesis of a problem.

PREREQUISITES: Basic knowledge in programming languages (Pascal and C++).

TEACHING METHODS: Lectures in multimedia variant; developed web site with all lecture and practical materials of the course; practical work in laboratory. Published tutorial for every lecture and laboratory theme.

METHOD OF ASSESSMENT: Written examination with developed individual program.

INSTRUCTION LANGUAGE: English.

BIBLIOGRAPHY:

1.Clifford A. Shaffer, Data Structures and Algorithm Analysis, 2013. 2.Sandeep Sen, Lecture Notes for Algorithm Analysis and Design, 2013. 3.Sara Baase, Computer Algorithms: Introduction to Design and Analysis, 2009. 4.Samir Khuler, Design and Analysis of Algorithms, 2012. 5.A.A.Puntambekar, Design and Analysis of Algorithms, 2010. 6.Стойчев Ст., Синтез и анализ на алгоритми и програми, издателство на ТУ- София. 7.Седжуик Р., Алгоритми на С, том 1 – 4, СофтПрес, 2002. 8.Dasgupta, S., C.H. Papadimitriou, and U.V. Vazirani. *Algorithms*, 2006. 9.Thomas Runkler, Data Analytics, 2012. 10.Sedgewick R., Wayne K., Algorithms, Addison-Wesley Professional 2011

DESCRIPTION OF THE COURSE

Name of the course Physics (General Physics)	Code BCSCe04	Semester: 1
Type of teaching: Lectures and Laboratory exercises	Lessons per week: L –2 hours LE – 1 hour	Number of credits: 5

LECTURER: Prof. DSc Phys. and DSc Eng. Marin Nenchev Nenchev, Rresearch and Development Division at the Technical University of Sofia;
Mobile: 0895587436, e-mail: marnenchev@yahoo.com

COURSE STATUS IN THE CURRICULUM: Compulsory course in English for the students in the Bachelor Degree Programme on Computer Science and Engineering of the Faculty of Computer Systems and Technologies , Department of Computer Science

AIMS AND OBJECTIVES OF THE COURSE: To develop students competences and confidence to use necessary base of physical knowledge's relevant to their future engineering activity. The emphasis is on the development of the student's ability to use physics with understanding, to solve engineering problems effectively and to help understanding Further Engineering Courses and other Engineering Subjects. On the base of the obtained knowledge, the students to be able to understand the physical principles of the functioning of different electronic and electric parts of the computer and telecommunication systems. Also the physical knowledge's are important for their general technical culture. Knowledge and skills in General Physics will be the essential part of the intellectual capacity to develop new constructions or modifications of the existing devices.

DESCRIPTION OF THE COURSE: To achieve the desired objectives the course covers in corresponding attention different parts of General Physics, related with lecture's hours at disposition. Will be considered all physical disciplines, especially with attention the basics one – selected parts of Mechanics, Electricity and Magnetism, shortly will be discussed parts of the Oscillatory motion and Sound, Heat, Fluids and Hydrodynamics. The course will present some aspects of the Electromagnetic waves and optics, some ideas about Quantum mechanics, Atomic and Nuclear physics and Relativity.

PREREQUISITES: School Mathematics and Physics, University Mathematics Part I,

TEACHING METHODS: Lectures and practical exercises: traditional mode; digital projector

METHOD OF ASSESSMENT: One intermediary tests (to 25%); written examination-test at the end of the semester with questions for development and solution of problems (70%). Bonus for activity and regular presence at the lectures to additional 0.4 units

INSTRUCTION LANGUAGE: English

BIBLIOGRAPHY:

Composite notes in electronic format "General Physics" by Prof. M.Nenchev with supplements from him - a selection of well-established student textbooks in English on general physics for non-physicians and books, particularly richly illustrated and with appropriate tasks. Provided by the lecturer in electronic format and also, after each lecture - selected by them basic material - printed on paper

DESCRIPTION OF THE COURSE

Name of the course: Automation of Engineering Design: CAD Systems	Code: BCSCe05	Semester: 1
Type of teaching: Lectures, Laboratory Works	Hours per week: L – 2 hours, LW – 2 hours	Number of credits: 5

LECTURER:

Prof. Ph.D. Eng. Boris Tudjarov (FCST), tel: 02/965 – 3385; email: bntv@tu-sofia.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM:

Compulsory for students – Bachelor of “Computer Science” in the Faculty of Computer Systems and Technologies at the Technical University of Sofia.

AIMS AND OBJECTIVES OF THE COURSE:

The aim of the course is to provide students with basic knowledge of the engineering design process and contemporary approaches and means for design, documentation and presentation of engineering solutions with a focus on computer subjects.

DESCRIPTION OF THE COURSE:

The course "Automation of Engineering Design: CAD Systems" is taught in the first semester. The students are introduced to the main stages of the engineering design process. Special attention is paid to the practical use of contemporary and available CAD systems in the design of various engineering projects (ie. "CAD outside"). The students acquire basic information about the so-called "CAD from inside" – ie. learn mathematical algorithms and capabilities for programming within CAD environment. The subjects of discussion and use are also engineering activities directly related to the engineering design process as: analysis of engineering projects, solve optimization problems, modeling and simulation and rational use of the Internet.

PREREQUISITES:

Basic knowledge on using computers is necessary.

TYPE OF TEACHING:

The lectures are delivered in halls with multimedia projector. The laboratory works are held in computer laboratories.

METHOD OF ASSESSMENT:

Final assessment is determined by defined fixed rules according to the results of the exam and laboratory works.

LANGUAGE OF INSTRUCTION: English

BIBLIOGRAPHY: 1. Chang K., e-Design: Computer-Aided Engineering Design, Academic Press Inc., 2015, ISBN 978-0-12-382038-9; 2. Lieu D. and Sorby Sh., Visualization, Modeling and Graphics for Engineering Design, Delmar, Cengage Learning, 2009, ISBN 978-1-4018-4249-9; 3. Hughes J. and oth., Computer Graphics - Principles and Practice, Pearson Education Inc., 2014, ISBN 978-0-321-39952-6; 4. Parisi T., Programming 3D Applications with HTML5 and WebGL, O'Reilly Media Inc., 2014, ISBN: 978-1-449-36296-6; 5. Nakov O. and oth., Internet Programming Technologies, Technical University of Sofia, 2011, ISBN 978-954-438-937-6; 6. Mitrev R., Computer modeling and simulation. Modeling of continuous dynamical systems, Propeler, Sofia, 2016, ISBN 978-954-392-355-7; 7. Brutzman, D. and Daly, L., X3D: Extensible 3D Graphics for Web Authors, Morgan Kaufmann Publishers, 2007, ISBN 978-0-12-088500-8; 8. Grigorov B., and Mitrev R., SolidWorks – Practical Guide, Perfect Consult Ltd., 2008, ISBN 978-954-565-052-9; 9. Omura G. and Benton B., Mastering AutoCAD® 2015 and AutoCAD LT® 2015, John Wiley & Sons Inc., 2014, ISBN 978-1-118-86208-7; 10. Google SketchUp® and SketchUp® Pro 7 Bible, Wiley Publishing, Inc., 2009, ISBN: 978-0-470-29229-7. 11. Fulton St. and Fulton J., HTML5 Canvas, O'Reilly Media Inc., 2011, ISBN: 978-1-449-39390-8.

DESCRIPTION OF THE COURSE

Name of the course: Programming I	Code: BCSCe06	Semester: I
Type of teaching: Lectures and Laboratory work	Lessons per week: L – 2 hours, LW– 2 hours	Number of credits: 6

LECTURER:

Prof. Ph.D. Milena Lazarova (FCST), tel.: 965 3285, email: milaz@tu-sofia.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM:

Compulsory for the students of specialty “Computer Science and Engineering” of the Faculty of Computer Systems and Technologies of TU- Sofia required for obtaining Bachelor’s Degree.

AIMS AND OBJECTIVES OF THE COURSE:

The aim of the course is to give the students basic terms of the computer’s structure and functioning, to teach the students means of information representation, to give them knowledge about the techniques of algorithm’s development and few basic algorithm’s classes as well as skills for development of programs using Visual Basic programming language.

DESCRIPTION OF THE COURSE:

The course is providing basic knowledge in development of algorithms, their programming using particular programming language and running and testing of the programmes under certain operation system. The structure and the main operational principles of the computer systems are given. The means and accuracy of information presentation are also considered. Some of the key classes of algorithms and data structures are studied. Skills for using basic office applications are gained as working with word processing application, creation of presentations, creation of diagrams and flow-charts, using macros. The main techniques of the structural approach of programming and their application using Visual Basic programming language are introduced.

PREREQUISITIES:

Mathematics

TEACHING METHODS:

Lectures using video-presentation with beamer, laboratory works under an assistant guidance for practicing on particular problems.

METHODS OF ASSESSMENT:

Two tests at the middle and the end of the semester. The results of each test determine 40% of the final value; 20% of the final grade is determined by the task performance during laboratory classes.

INSTRUCTION LANGUAGE: English

BIBLIOGRAPHY:

Course web site (<http://cs.tu-sofia.bg/enmoodle/course/view.php?id=7>); Gotchev G., M. Lazarova, Computing I, Technical University of Sofia, 2008; J. Gammack, V. Hobbs, D. Pigott, The Book of Informatics, Cengage Learning, 2011; Bryant R., Computer Systems: A Programmer's Perspective, Addison-Wesley, 2010; Harel D., Y. Feldman, Algorithmics: The Spirit of Computing, Springer, 2012; Cormen T., C. Leiserson, R. Rivest , C. Stein, Introduction to Algorithms, MIT Press, 2009; Sedgewick R., K. Wayne, Algorithms, Addison-Wesley, 2011; Null L., J. Lobur, Essentials of Computer Organization and Architecture, Jones&Bartlett Learning, 2010; Hennessy J., D. Patterson, Computer Architecture: A Quantitative Approach, Morgan Kaufmann, 2011; Sipser M., Introduction to the Theory of Computation, Cengage Learning, 2012.

DESCRIPTION OF THE COURSE

Name of the course: English for Computing	Code: BCSCe07	Semester: 1
Type of teaching: Laboratory work	Lessons per week: LW – 2 hours	Number of credits: 3

LECTURER:

Senior Lecturer Yordanka Angelova (DFLAL), – tel.: 965 3162, email: danny_angelova@tu-sofia.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory for students on the “Computer Science and Engineering” study programme leading to a Bachelor’s degree (Faculty of Computer Systems and Technologies of TU-Sofia).

AIMS AND OBJECTIVES OF THE COURSE: Introduction and acquisition of language related to basic topics in the field of computer science. Development of skills enabling students to use scientific literature in that specific area and to participate successfully in the process of training.

DESCRIPTION OF THE COURSE: Introduction of the topics of: The Computer, Computer Science, Modern Machine Architecture, Types of computers and their main parts. Reading for general comprehension. Introduction and practice of basic terms and vocabulary related to the topics. Introduction and practice of basic grammatical items and structures.

PREREQUISITES: Basic knowledge in general English (level A2 under the Common European Framework).

TEACHING METHODS: Practical work in laboratory classes. A textbook published for that specific course is used.

METHOD OF ASSESSMENT: Continuous assessment.

INSTRUCTION LANGUAGE: English.

BIBLIOGRAPHY:

- Dinos Demetriades - Workshop: Information Technology (Lower-Intermediate), OUP, 2003.*
E.H.Glendinning, John McEwan - Oxford English for Information Technology (Intermediate - Upper-Intermediate), OUP, 2002.
Lindsay White - Engineering Workshop, OUP, 2003.
Santiago Remecha Esteras – Infotech, CUP, 2004.
N. Brieger, A. Pohl - Technical English Vocabulary & Grammar, Summertown, 2002.
K. Boeckener, P.Ch.Brown - Oxford English for Computing, OUP, 2000.
Y.Angelova – English for Computer Science, Publishing House -Technical University – Sofia, 2010
I. Stoynezhka, D. Mihailova - English for Computing, Alma Mater International, Gabrovo, 2001
R. Murphy - Essential Grammar in Use: Supplementary Exercises, CUP, 2002.
H. Naylor, R. Murphy - English Grammar in Use: Supplementary Exercises, CUP, 2002.
J. Thomson, A. V. Martinet - Practical English Grammar Exercises 2 & 2, OUP, 2000.

DESCRIPTION OF THE COURSE

Name of the course Physical education	Code: BCSCe17	Semester: 1
Type of teaching: Seminars and workshops	Lessons per week: Seminars: 4 hours	Number of credits: 0

LECTURER:

Senior Lecturer Ivan Petrov Venkov; Senior Lecturer Valeri Georgiev Peltekov, Senior Lecturer Romyana Nikolova Vetova, Senior Lecturer Ivan Stoyanov Ivanov; Senior Lecturer Alexander Alexandrov Alexandrov; Senior Lecturer Asya Krasteva Tsarova - Vassileva; Senior Lecturer Krassimira Stoyanova Ivanova; Senior Lecturer Todor Stefanov Ivanov, Senior Lecturer Georgi Dimitrov Palazov, Senior Lecturer Romyana Georgieva Tasheva, Senior Lecturer Mariana Vladimirova Tomova, Senior Lecturer Plamen Antonov Antonov, Senior Lecturer Velizar Vaskov Lozanov, Senior Lecturer Ivan Georgiev Ivanov; Senior Lecturer Georgi Petrov Vassilev, Senior Lecturer Kapka Konstantinova Vassileva, Senior Lecturer Petya Yordanova Arbova; Senior Lecturer Milena Milkova Lazarova; Senior Lecturer Valentine Valentinov Velev, Senior Lecturer Dimitar Ivanov Dimov; Lecturer Maya Borisova Chipeva; Lecturer Yanita Dimitrova Raikova
Technical University - Sofia, DFVS, Section of Individual Sports and Games Sports and Section of Water and mountain sports"

COURSE STATUS IN THE CURRICULUM: Compulsory discipline for the full-time students of all specialties of TU- Sofia required for obtaining a Bachelor's Degree.

AIMS AND OBJECTIVES OF THE COURSE: The purpose of teaching physical education is through the methods and means of physical education to increase physical activity of students. Additional sporting skills of the respective sport aim to create lasting habits for individual classes in physical education. Talented athletes to protect their honor and prestige to TU-Sofia in sports competitions.

DESCRIPTION OF THE COURSE: Students are trained with a flexible modular system, tailored to their abilities and desire, the choice of sport. Programs allow to improve the skills of secondary and primary education in selected sports. Students receive a thorough knowledge of the sport. Sports Complex TU possible to conduct many types of sports. Along with sports practiced outside the sports complex, students learn and improve in 17 different sports.

TEACHING METHODS: In structuring the curriculum using practical communicative approach consistent with the functional and physical abilities of students. The modular principle enables learning sporting skills in this sport.

METHOD OF ASSESSMENT: Carry out tests of physical ability. Tests for motor skills and habits in different sports.

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY: Methodological manuals and regulations in selected sports.

DESCRIPTION OF THE COURSE

Name of the course Higher Mathematics II	Code: BCSC10	Semester: 2
Type of teaching: Lectures and Seminar exercises	Lessons per week: L –3 hours, SE – 2 hours	Number of credits: 5

LECTURER:

Assoc. Prof. Dr. Snejanka D. Donevska (FAM), tel.: 02965-2356, e-mail: snejanka_bd@yahoo.co.uk
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory course in English for the students in the Bachelor Degree Programme on Computer Science and Engineering of the Faculty of Computer Systems and Control, Department of Computer Science

AIMS AND OBJECTIVES OF THE COURSE: To develop students' competence and confidence to handle mathematical methods relevant to engineering. The emphasis is on the development of the student's ability to use mathematics with understanding, to solve engineering problems effectively.

DESCRIPTION OF THE COURSE: To achieve the desired objectives the course covers appropriate topics of Mathematics for undergraduate courses in all engineering disciplines: Indefinite and Definite integrals; Power series; Fourier Series; Introduction to Ordinary differential equations; Multivariable calculus: partial differentiation, optimization problems, double integrals and applications.

PREREQUISITES: High School Mathematics, Mathematics Part I, Physics

TEACHING METHODS: Lectures and seminars: traditional mode; application of software packages; digital projector

METHOD OF ASSESSMENT: One 2-hour midterm assessment and one 2-hour assessment at the end of semester (total 30%); written examination at the end of semester (70%).

INSTRUCTION LANGUAGE: English

BIBLIOGRAPHY:

Key text

1. Bradistilov G., *Higher Mathematics – Part II*, Technika, Sofia, 1964 (in Bulgarian)
2. Varbanova E.A., *Mathematical Analysis-I*, TU-Sofia, Sofia, 2009 (in Bulgarian)
3. Croft A., R. Davison, *Mathematics for Engineers – A Modern Interactive Approach*, Prentice Hall, 1994.
4. Donevska A., B. Donevski, *Calculus and Analytic Geometry*, TU-Sofia, 2007.
5. Stoynov Y., E.Varbanova, *Higher Mathematics - Part 2 for Engineering Students*, TU-Sofia, 2013.
6. Stroud K.A., D. J. Booth, *Engineering Mathematics*, 6th Ed., PALGRAVE MACMILLAN, 2007.

Supplementary

1. Donevska S., I. Trendafilov, *Applied mathematical analysis*, KING, Sofia, 1997 (in Bulgarian)
2. Doychinov D., *Математически анализ*, SOFTEX, Sofia, 2004 (in Bulgarian)
3. Varbanova E.A., *Mathematical Analysis-I, Exercises*, TU-Sofia, Sofia, 2011 (in Bulgarian)
4. Edwards C.H., Jr. and D.E.Penney, *Calculus and Analytic Geometry*, 3rd Ed., Prentice Hall Inc., 1990
5. James G. et al., *Modern Engineering Mathematics*, Addison Wesley, 2001.

DESCRIPTION OF THE COURSE

Name of the course Discrete Structures	Code: BCSCe11	Semester: 2
Type of teaching: Lectures and laboratory work	Lessons per week: L – 2 hours; LW –2 hours	Number of credits: 4

LECTURER:

Prof. PhD. Valeri Mladenov (FA), tel./fax. +359 2 965 2386, e-mail: valerim@tu-sofia.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Elective for the students' specialty, Computer Science and Engineering, BEng program of the Department of Computer Science.

AIMS AND OBJECTIVES OF THE COURSE: To introduce students to the basic concepts of some essential areas which are important for the computer science and to acquire some skills for application of some methods and effective algorithms for solving different computer science and combinatorial problems. At the end of the course the students will acquire the basic discrete structures that are used for mathematical modeling in the different areas of the applied mathematics and computer science: formal logic and logic functions, sets, operations on sets and relations on finite sets and presentation as structured data, graphs, trees and relations between graphs, binary relations and Boolean matrixes, algorithms and complexity of the algorithms; combinatorics; finite automata.

DESCRIPTION OF THE COURSE: The main topics concern: formal logic and logical operations and functions; predicate and predicate functions; set theory; mathematical reasoning, relations and their representation as data structures, functions, Boolean algebra and Boolean functions, graphs and trees, combinatorics, mathematical induction and testing the program correctness by use of the mathematical induction, recursion and recursive functions and algorithms, finite automata.

PREREQUISITES: Mathematics I and II and Programming I and II.

TEACHING METHODS: Lectures present on a black board and by digital projector. Labs take part solving problems analytically and by computer simulations.

METHOD OF ASSESSMENT: Final rate based on the points from 2 tests (2*10 pt.) during the semester + the exam (40 pt.). Final result is: sum of points by test 1, test 2 and exam weighted by coefficient 0,1.

INSTRUCTION LANGUAGE: English

BIBLIOGRAPHY:

Key text

1. Kenneth H. Rosen, *Discrete Mathematics and its Applications*, McGraw-Hill, 7th Edition 2012, ISBN 0-07-338309-0, 1071 pp.; 2. Filipova-Petrakieva, S., V. Mladenov, *Problems with solutions on discrete structures*, Publishing house "Avangard Prima", Sofia, First edition 2012, ISBN: 978-954-323-947-4, 84 pp.

Supplementary

1. R. A. Brualdi, *Introductory Combinatorics*, 5th ed., Prentice-Hall, Englewood Cliffs, NJ, 2009. 2. G. Chartrand, L. Lesniak, and P. Zhang, *Graphs and Digraphs*, 5th ed., Chapman and Hall/CRC, Boca Raton, 2010. 3. T. H. Cormen, C. E. Leieron, R. L. Rivest, and C. Stein, *Introduction to Algorithms*, 3rd ed., MIT Press, Cambridge, MA, 2009. 4. D. A. Gunderson, *Handbook of Mathematical Induction*, Chapman and Hall/CRC, Boca Raton, Florida, 2010. 5. H. F. Mattson, Jr., *Discrete Mathematics with Applications*, Wiley, New York, 1993.

DESCRIPTION OF THE COURSE

Name of the course Semiconductor Elements	Code: BCSCe12	Semester: 2
Type of teaching: Lectures and laboratory work	Lessons per week: L – 2 hours; LW –1 hour	Number of credits: 4

LECTURER:

Prof. Ph.D. Tania Vasileva (FETT) – tel.: 965 2490, email: tkv@tu-sofia.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory course for the students of specialty, Computer Science and Engineering, BEng program of the Department of Computer Science.

AIMS AND OBJECTIVES OF THE COURSE: The course aims to familiarise students with the basic building elements of electronic circuits. At the end of the course the students are expected to have basic knowledge and to be able to apply the basic semiconductor elements, to know their characteristics, mode of operation, important parameters, and to choose appropriate device for given application using datasheets.

DESCRIPTION OF THE COURSE: The main topics concern: Introduction to Semiconductors, PN Junction Diodes, Zener Diodes, Bipolar Junction Transistors, Metal Oxide Semiconductor Field Effect Transistors, Optoelectronic Devices, Introduction to Integrated Circuit, Displays

PREREQUISITES: Physics, Mathematics

TEACHING METHODS: Lectures, using video-presentation with beamer, interactive multimedia learning materials, laboratory work with practical measurements, finished with protocols and defence.

METHOD OF ASSESSMENT: Exam during the exam session. Final mark is calculated based on the written exam (70%), laboratory work (30%), lecture attendance (10%).

INSTRUCTION LANGUAGE: English

BIBLIOGRAPHY:

- Interactive multimedia e-trainers: <http://lark.tu-sofia.bg/sd/e-learning.html>
 - Electrical Engineering; 2. Semiconductors; 3. PN Junction Diodes; 4. Zener Diodes; 5. Bipolar Junction Transistors; 6. Bipolar Transistor Amplifiers; 7. MOS Transistors; 8. Integrated Circuits; 9. Displays
- Lecture slides <http://lark.tu-sofia.bg/sd/lectures>
- [Electronics Fundamentals: Circuits, Devices and Applications \(8th Edition\) \(Floyd Electronics Fundamentals Series\)](#) by Thomas L. Floyd, David M. Buchla (Hardcover – June 23, 2009) Prentice Hall, ISBN-10: 0135072956
<http://www.amazon.com/Electronics-Fundamentals-Circuits-Devices-Applications/dp/0135072956>

DESCRIPTION OF THE COURSE

Name of the course Digital and Microprocessor Devices	Code: BCSCe13	Semester: 2
Type of teaching: Lectures and laboratory work	Lessons per week: L– 2 hours; LW–1 hour	Number of credits: 4

LECTURER:

Asist.Prof.PhD Kamelia Raynova, (FCST), tel.: 965 2164, e-mail: kkaneva@tu-sofia.bg
Technical University of Sofia, Bulgaria

COURSE STATUS IN THE CURRICULUM: Compulsory course for the students of specialty Computer Science and Engineering in the bachelor program of the Faculty of Computer Systems and Technologies.

AIMS AND OBJECTIVES OF THE COURSE: This course is for students to learn and be able to apply the approaches, methods and technical tools for design, analysis and application of digital and microcomputer systems in accordance with their needs and interests to acquire new knowledge and skills in this subject area. At the end of the course students will know the elements of digital and microprocessors and defines the basic concepts, variables, parameters and relationships in the theory of digital electronics and microcomputer technology and will be able to use them in the design of microcomputer systems management processes, facilities and systems.

DESCRIPTION OF THE COURSE: The course examines: types of digital information conversion codes, basic arithmetic, basic logic functions, minimization methods, decoders, multiplexers, triggers, types, registers, counters, semiconductor memory, the structure of single chip microcomputers (microcontrollers) - organization of memory programming model, the types of interfaces - parallel and serial.

PREREQUISITES: The successful completion of this course is based on the knowledge and practical skills, obtained in some previous courses as: Theoretical electrotechnics and Electronics.

TEACHING METHODS: Lectures, using slides, case studies, laboratory and course work, work in teams and course work description preparation. Students have at their disposal these lecture notes well in advance, so they are able to prepare themselves for further fruitful discussions. Various supported materials are also available at: <http://cs-tusofia.eu/> incl. labs preparation instructions, keywords, references, etc

METHOD OF ASSESSMENT: Achieving the goal of teaching the course is monitored by continuous assessment, compiled from two components: student participation in laboratory exercises (with a weight of 0.2) and exam at the end of the semester (with a weight of 0.8).

Exam during the exam session with duration of two academic hours (90 min), students give written answers to set of 7 questions. Each correct answer gives 0,5 or 1 point (n). Mark “excellent” (6) is awarded when $n \geq 5,5$; “very well” (5) - when $n \geq 4,5$; “well” (4) – in case of $n \geq 3,5$, “satisfactory” (3) - when $n=3$. The final mark is arranged as a result from the written exam’s results (80%) and this of the laboratory exercises (20%).

INSTRUCTION LANGUAGE: English

BIBLIOGRAPHY:

1. Лекционни записки, презентационни слайдове (lecture notes).
2. Sajjan G. Shiva, Computer Design and Architecture, Third edition, 2000
3. Clemens A., The Principles Computer Hardware, Oxford University Press, 1994.
4. Sharma K., Advanced Semiconductor Memories, Willey Inter-Science, 2003.
5. Hans Peter Messmer, Pentium Klassische Konzepte, Addison-Wesley, 2004.
6. A. Saha, N. Manna, Digital principles and logic design, 2007
7. Tim Wilmshurst, Designing Embedded Systems with PIC Microcontrollers, 2007

DESCRIPTION OF THE COURSE

Name of the course: Computing II	Code: BCSCe14	Semester: 2
Type of teaching: Lectures and laboratory work	Lessons per week: L – 2 hours; LW – 1 hour	Number of credits: 4

LECTURER:

Prof. Ph.D. D. Gotseva (FKST) – tel.: 965 23383, email: dgoceva@tu-sofia.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory for the students' specialty "Computer Science and Engineering" of the Faculty of Computer Systems and Technologies of Technical University of Sofia – bachelor degree.

AIMS AND OBJECTIVES OF THE COURSE: The aim of the discipline is to introduce the students with fundamentals of computing into MS Excel, to acquire competitions for macro and algorithm creation of the products tasks, and to have possibilities to create sample Visual Basic for Application (VBA).

DESCRIPTION OF THE COURSE: The main topics concern: Excel basics; Creating, Recording and Playing macros; Introduction into VBA programming; VBA Integrated Development Environment (IDE); Execution of Excel Applications; VBA Programming Language; Common properties with Microsoft Visual Basic; Data types, Variables, and Constants; Arrays; Scope and Lifetime of the Variables; Functions and Subroutines; Built-in functions and statements; Passing Arguments to Procedures and Functions; Control Statements; Run-time error maintenance; Using Name Property; Excel Object Model; Creating Application into Excel; Excel Events; Menus and Toolbars; Built-in Dialogs and User-defined Dialogs; VBA Access to the Excel Object Model; Basic Objects, Methods, Properties, and Events; Application, Workbook, Worksheet, Range, Pivot table, Chart Objects Summary; Creating Sample Applications with Excel Object; Data Lists and Tables; Sorting and Filtering Data; etc.

PREREQUISITES: Computing I

TEACHING METHODS: Lectures, using slides, case studies, laboratory and course work, work in teams, and course work description preparation and defence.

METHOD OF ASSESSMENT: One 1.5-hour assessment at end of semester (60%), laboratories (20%), course work - one off assignment (20%)

INSTRUCTION LANGUAGE: English

BIBLIOGRAPHY: 1. <http://dgotseva.com> – course materials. 2. John Walkenbach, Excel 2007 Power Programming with VBA, John Wiley & Sons, 2011. 3. Excel 2010: VBA Programming, Axzo Press, 2011. 4. Excel 2010: Advanced, Axzo Press, 2011. 5. Julitta Korol, Microsoft Excel 2010 Programming by Example: With VBA, XML, and ASP, Mercury Learning and Information, 2010. 6. Bill Jelen, Tracy Syrstad, VBA and Macros: Microsoft Excel 2010, Pearson Que, 2010. 7. <http://www.excel-vba.com/>. 8. http://excelvbator.com/vba_tutorial.html. 9. <http://www.functionx.com/vbaexcel/>,

DESCRIPTION OF THE COURSE

Name of the course: Theory of Electrical Engineering	Code: BCSCe15	Semester: 2
Type of teaching: Lectures, tutorials and laboratory work	Lessons per week: L-3 hours, Tut-1 hour, LW-1 hour	Number of credits: 5

LECTURER:

Full Prof. PhD. Valeri Mladenov (FA), phone: 9652386, [email: valerim@tu-sofia.bg](mailto:valerim@tu-sofia.bg)

Assoc. Prof. Ph.D. Simona Petrakieva (FA), phone:9652388, [email: petrakievas-te@tu-sofia.bg](mailto:petrakievas-te@tu-sofia.bg)

Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: The course is compulsory for full-time and part-time students for receiving the B.Sc. degree in Electronics, Telecommunications and Computer Systems and Technology in FETT, FTC, FCST at the Technical University of Sofia.

AIMS OF THE COURSE: To teach students the basic methods of analysis of linear circuits with lumped parameters and to give basic concepts of the theory of nonlinear circuits and the theory of electromagnetic field.

DESCRIPTION OF THE COURSE: The course includes basic concepts and laws for electric circuits, sinusoidal steady-state analysis of linear circuits, transformations of electric circuits, magnetically coupled circuits, methods for analysis of linear circuits, properties and theorems for electric circuits, resonance, three-phase circuits, two-port networks, the classical method of studying transients in linear circuits, basics notions of the theory of nonlinear circuits and the theory of electromagnetic field.

PREREQUISITES: Mathematics I, II and III and General Physics I and II.

TEACHING METHODS:

Lectures, group seminars, laboratory practice with laboratory sets and appropriate measuring instruments. Written laboratory practice reports are required from students that are checked by the teacher. A course project with PSpice is included also. Each student has to prepare a course project assignment using a PC in the PSpice environment.

METHOD OF ASSESSMENT:

A written examination at the end of the third semester. Test paper including two problems during the tutorials. Defending the course project assignment and laboratory practice reports. The final result is obtained by aggregation of the marks from the written examination, test paper, laboratory practice reports and course project assignment.

INSTRUCTION LANGUAGE: English

BIBLIOGRAPHY: 1. Brandisky K., J.Georgiev, V.Mladenov and R.Stancheva, Textbook on Theoretical Electrical Engineering, part I. KING, Sofia.2004, ISBN 954-9518-28-0 (in Bulgarian); 2. Brandisky K.,J.Georgiev, V.Mladenov and R.Stancheva, Textbook on Theoretical Electrical Engineering, part II, KING, Sofia, 2005, ISBN 954-9518-29-9 (in Bulgarian); 3. Brandisky K. and others, Seminar's Handbook of Theoretical Electrical Engineering, part I, KING, Sofia.2004, ISBN 954-9518-26-4 (in Bulgarian); 4. Brandisky K.and others, Seminar's Handbook of Theoretical Electrical Engineering, part II, KING, Sofia.2004, ISBN 954-9518-27-2 (in Bulgarian); 5. Brandisky K. and others, Laboratory Handbook of Theoretical Electrical Engineering, KING, Sofia 2007, 2010, ISBN 954-9518-24-8 (in Bulgarian); 6. Brandisky K., V. Mladenov, K. Stanchev, Handbook for solving problems in Theoretical Electrical Engineering using PSpice (OrCAD 16.3), KING, Sofia 2012, ISBN 978-954-9518-72-6.

DESCRIPTION OF THE COURSE

Name of the course: English for Computing	Code: BCSCe16	Semester: 2
Type of teaching: Laboratory work	Lessons per week: LW – 2 hours	Number of credits: 3

LECTURER:

Senior Lecturer Yordanka Angelova (DFLAL), – tel.: 965 3162, email: danny_angelova@tu-sofia.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory for students on the “Computer Science and Engineering” study programme leading to a Bachelor’s degree (Faculty of Computer Systems and Technologies of TU-Sofia).

AIMS AND OBJECTIVES OF THE COURSE: Introduction and acquisition of language related to basic topics in the field of computer science. Development of skills enabling students to use scientific literature in that specific area and to participate successfully in the process of training.

DESCRIPTION OF THE COURSE: Introduction of the topics of: Central Processing Unit, Operating Systems, Modern Machine Architecture, Operating Systems Components. Reading for general comprehension. Introduction and practice of basic terms and vocabulary related to the topics. Introduction and practice of basic grammatical items and structures.

PREREQUISITES: Basic knowledge in general English (level A2 under the Common European Framework).

TEACHING METHODS: Practical work in laboratory classes. A textbook published for that specific course is used.

METHOD OF ASSESSMENT: Continuous assessment.

INSTRUCTION LANGUAGE: English.

BIBLIOGRAPHY:

- Dinos Demetriades - Workshop: Information Technology (Lower-Intermediate), OUP, 2003.*
H. Glendinning, John McEwan - Oxford English for Information Technology (Intermediate - Upper-Intermediate), OUP, 2002.
Indsay White - Engineering Workshop, OUP, 2003.
Santiago Remecha Esteras – Infotech, CUP, 2004.
N. Brieger, A. Pohl - Technical English Vocabulary & Grammar, Summertown, 2002.
K. Boeckener, P.Ch.Brown - Oxford English for Computing, OUP, 2000.
Y. Angelova – English for Computer Science, Publishing House -Technical University – Sofia, 2010
I. Stoynezhka, D. Mihailova - English for Computing, Alma Mater International, Gabrovo, 2001
R. Murphy - Essential Grammar in Use: Supplementary Exercises, CUP, 2002.
H. Naylor, R. Murphy - English Grammar in Use: Supplementary Exercises, CUP, 2002.
J. Thomson, A. V. Martinet - Practical English Grammar Exercises 2 & 2, OUP, 2000.

DESCRIPTION OF THE COURSE

Name of the course Physical education	Code: BCSCe08, BCSCe17	Semester: 2
Type of teaching: Seminars and workshops	Lessons per week: Seminars – 4 hours	Number of credits: 0

LECTURER:

Senior Lecturer Ivan Petrov Venkov; Senior Lecturer Valeri Georgiev Peltekov, Senior Lecturer Romyana Nikolova Vetova, Senior Lecturer Ivan Stoyanov Ivanov; Senior Lecturer Alexander Alexandrov Alexandrov; Senior Lecturer Asya Krasteva Tsarova - Vassileva; Senior Lecturer Krassimira Stoyanova Ivanova; Senior Lecturer Todor Stefanov Ivanov, Senior Lecturer Georgi Dimitrov Palazov, Senior Lecturer Romyana Georgieva Tasheva, Senior Lecturer Mariana Vladimirova Tomova, Senior Lecturer Plamen Antonov Antonov, Senior Lecturer Velizar Vaskov Lozanov, Senior Lecturer Ivan Georgiev Ivanov; Senior Lecturer Georgi Petrov Vassilev, Senior Lecturer Kapka Konstantinova Vassileva, Senior Lecturer Petya Yordanova Arbova; Senior Lecturer Milena Milkova Lazarova; Senior Lecturer Valentine Valentinov Velev, Senior Lecturer Dimitar Ivanov Dimov; Lecturer Maya Borisova Chipeva; Lecturer Yanita Dimitrova Raikova
Technical University - Sofia, DFVS, Section of Individual Sports and Games Sports and Section of Water and mountain sports"

COURSE STATUS IN THE CURRICULUM: Compulsory discipline for the full-time students of all specialties of TU- Sofia required for obtaining a Bachelor's Degree.

AIMS AND OBJECTIVES OF THE COURSE: The purpose of teaching physical education is through the methods and means of physical education to increase physical activity of students. Additional sporting skills of the respective sport aim to create lasting habits for individual classes in physical education. Talented athletes to protect their honor and prestige to TU-Sofia in sports competitions.

DESCRIPTION OF THE COURSE: Students are trained with a flexible modular system, tailored to their abilities and desire, the choice of sport. Programs allow to improve the skills of secondary and primary education in selected sports. Students receive a thorough knowledge of the sport. Sports Complex TU possible to conduct many types of sports. Along with sports practiced outside the sports complex, students learn and improve in 17 different sports.

TEACHING METHODS: In structuring the curriculum using practical communicative approach consistent with the functional and physical abilities of students. The modular principle enables learning sporting skills in this sport.

METHOD OF ASSESSMENT: Carry out tests of physical ability. Tests for motor skills and habits in different sports.

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY: Methodological manuals and regulations in selected sports.