

DESCRIPTION OF THE COURSE

Name of the course: Information Security	Code: BCSCe19	Semester: 3
Type of teaching: Lectures and laboratory work	Lessons per week: L – 2 hours, LW – 1 hour	Number of credits: 4

LECTURER:

Prof. PhD Roumen Trifonov (FCST), tel.: 965 2838, e-mail: r.trifonov@tu-sofia.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Obligatory subject for the students of specialty Computer Science and Engineering in the bachelor programme of the Faculty of Computer Systems and Technologies at TU-Sofia.

AIMS AND OBJECTIVES OF THE COURSE: The aim of the course is to acquaint students with the basic principles, standards and technics in the field of technologies for computer security. This will help them in future to professionally solve tasks for choice of effective tools for protection of computer systems and networks and use in practice.

DESCRIPTION OF THE COURSE: The course discusses the problems concerning design, building and applying methods and technical tools ensuring computer security. The lectures begin with introduction to basic definitions and key futures in the field. It presents the most important politics, approaches, standards and attacks in network and information security, also the proper technics for protection of network, firewall, protected e-messages interchange, DNS, DDoS/Botnets and Web-application protection. The laboratory work helps to better rationalization of lecture material and contribute to formation of practical skills.

PREREQUISITES: Basic knowledge in informatics.

TEACHING METHODS: Lectures (with slides, multimedia projector) and additional text materials; laboratory work (based on instructions) with computer.

METHOD OF ASSESSMENT: written examination at the end of the first semester.

INSTRUCTION LANGUAGE: English.

BIBLIOGRAPHY: 1. International standards publications ISO, ITU, ETSI, etc.. - <http://www.itu.int/ITU-T/index.html> 2. ENISA information - <http://www.enisa.europa.eu/> 3. Special publications of NIST - <http://csrc.nist.gov/> 4. O. Nakov, R. Trifonov, others, Computer Security, Avangard Prima 2012; 5. O. Наков, Пл. Вачков, Р. Трифонов и др., Мрежова и Информационна Сигурност. Авангард Прима 2013

DESCRIPTION OF THE COURSE

Name of the course: COMPUTER ARCHITECTURE	Code: BCSCe20	Semester: 3
Type of teaching: Lectures, Laboratory Work, CW / CP	Hours per week: L – 2 hours, LW – 1 hour	Number of credits: 4

LECTURER:

Assoc. Prof PhD Iva Nikolova (FCSC), email: inni@tu-sofia.bg, TU-Sofia

Assoc. Prof. PhD Valentin Hristov (FCSC), v_hristov@tu-sofia.bg, TU-Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory for the students of specialty Computer Science and Engineering in the bachelor programme of the Faculty of Computer Systems and Technologies. The knowledge and skills obtained in the discipline create preconditions for multilateral implementation of the students in traditional engineering areas and specialized, high-tech fields of computer and information technology for modern computer systems and multicore platforms.

AIMS AND OBJECTIVES OF THE COURSE: To provide a solid basis for students: to study the concepts and mechanisms involved in the design of modern computer systems and to be able to explain how these concepts and mechanisms interact; to acquire knowledge about the architecture of computer systems; to apply this knowledge to solve new computer design problems in terms of searching a balance between the growing performance requirements of the implemented applications on the one hand and the existing technological constraints on the other; to acquire new knowledge (in accordance with their needs and interests) and skills in this subject area; to be able to use independently specialized literature related to the modern trends in the development of computer systems.

DESCRIPTION OF THE COURSE: Main topics: Main factors determining the performance of computer systems. Trends in the development of computer architectures; Instruction set architecture and microcode. Pipelining review - basic concepts and different types of hazards. Architecture of super-scalar processors - principles and types. Methods used to improve the performance of out-of-order processors. Concept of very long instruction word (VLIW) processors. Multi-core processors and platforms. System memory architecture review. Memory Protection. Cache Memory – types and advanced mechanisms used to improve cache performance. Memory management. Virtual memory. Architecture of the I/O system. Performance of computer systems - performance parameters, metrics and benchmarks.

PREREQUISITES: Programming Languages, Operating Systems, Digital Circuits, Analysis and Synthesis of Logic Circuits.

TYPE OF TEACHING: Lectures using video-presentation with beamer, laboratory works end with presentation of the results, parallelism profiles and estimation of the performance parameters of the parallel system for the certain task.

METHOD OF ASSESSMENT: Exam during the exam session two academic hours in the form of a test with open and closed questions and problems or tasks related to writing parallel programming code, semester assignments.

LANGUAGES OF INSTRUCTION: English.

BIBLIOGRAPHY:

1. Lecture presentations in eLearning platform „Moodle“ (cs.tu-sofia.bg)
2. Prinz, P., T. Crawford, J. L. Hennessy, and D. A. Patterson. "Computer Architecture: A Quantitative Approach." (2018)
3. Null, Linda, and Julia Lobur. The essentials of computer organization and architecture. Jones & Bartlett Publishers, (2014)
4. W. Stallings, Computer Organization and Architecture, Global Edition, Pearson Education Limited, (2015), Tanenbaum, A.S., Structured computer organization. Pearson Education India (2016).
5. Guide, Part. "Intel® 64 and IA-32 Architectures Software Developer's Manual." Volume 3B: System programming Guide, Part 2 (2011).
6. SPEC: www.spec.org, Intel® 64 and IA-32 Architectures Software Developer Manuals Manual (2018)
7. Intel® 64 and IA-32 Architectures Optimization Reference Manual (2017), ARM Infocenter (<http://infocenter.arm.com>)

DESCRIPTION OF THE COURSE

Name of the course Fundamentals of logical design	Code: BCSCe21	Semester: 3
Type of teaching: Lectures, tutorial and laboratory work	Lessons per week: L – 1 hour; TW – 1 hour, LW – 1 hour	Number of credits: 5

LECTURER:

Assist. Prof. PhD Diana Grigorova (FCST) – tel.: 965 3523 e-mail: dgrigorova@tu-sofia.bg
Technical University of Sofia

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

AIMS AND OBJECTIVES OF THE COURSE: The aim of the course is to give fundamental knowledge for analysis and synthesis of computer components.

DESCRIPTION OF THE COURSE: The course is an introductory course in computer logic and digital system design. The main topics concern: Boolean algebra, fundamentals of combinational logic circuits, fundamentals of sequential synchronous and asynchronous circuits. The material is illustrated with examples of basically computer components analysis and synthesis

PREREQUISITES: Discrete mathematics.

TEACHING METHODS: Lectures using video-presentation with beamer. Tutorial works on given problems. Laboratory works with a program simulator.

METHOD OF ASSESSMENT: Exam during the exam session with duration two academic hours, students give written answers to four tasks. Final mark is calculated based on the written exam (70%), tutorial work (20%) and laboratory work (10%).

INSTRUCTION LANGUAGE: English

BIBLIOGRAPHY: ...

1. Fundamentals of Logic Design, Charles H. Roth, Jr., 5th edition, 2006 Cengage Learning, ISBN-13: 978-0-495-07308-6
2. Digital Design and Computer Architecture, David Harris and Sarah Harris, 2nd Edition, 2012 Elsevier, ISBN 978-0-12-394424-5
3. Hardware and Computer Organization, Berger, A. S., Elsevier, 2005, ISBN 0-7506-7886-0

<http://www.ee.surrey.ac.uk/Projects/Labview/index.html>

<http://www.asic-world.com/digital/tutorial.html>

DESCRIPTION OF THE COURSE

Name of the course: Operating Systems	Code: BCSCe22	Semester: 3
Type of teaching: Lectures and Laboratory work	Hours per week: L – 2 hours; LW – 2 hours	Number of credits: 4

LECTURER:

Prof. Dr. George Popov (FCST), tel.: 965 3525, popovg@tu-sofia.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory for the students speciality „Computer Science and Engineering“ – bachelor degree (Faculty of Computer Systems and Technologies, Technical University-Sofia).

AIMS AND OBJECTIVES OF THE COURSE: The aim of the course is to ensure that the students understand the extent of the use of an operating system prior to a detailed study of internals. The topics of the course address both the use of operating systems and their design and implementation. A lot of the principles involved in operating systems use have wider applicability across the field of computer science, such as concurrent programming. Studying internal design has relevance in such diverse areas as dependable programming, algorithm design and implementation, building secure and safe systems, etc.

DESCRIPTION OF THE COURSE: The discipline gives the fundamental concepts that are applicable to a variety of the operating systems. The emphasis is on solving problems encountered in designing the operating systems, regardless of the underlying hardware. The main topics are: overview of operating systems, operating systems principles, processes and concurrency, CPU scheduling and dispatching, file systems, memory management, device management, distributed systems, security and protection. UNIX, Linux, Windows, and others modern systems are included as examples of existing systems.

PREREQUISITES: Basic knowledge in structure and functionality of computer devices and system, programming languages (C/C++, Pascal), software engineering.

TEACHING METHODS: Lectures (with slides, multimedia projector) and text materials; laboratory exercises (based on instructions) with a tutorial for every laboratory theme; project consulting; web site of the course.

METHOD OF ASSESSMENT: Written examination, based on two assessments during the semester (80%) and classes (20%). Every student has to demonstrate his own project. He is asked about problems encountered in the designing and implementation, and his decision.

INSTRUCTION LANGUAGE: English

BIBLIOGRAPHY

1. Silberschatz A., Galvin P. and Gagne G., Operating Systems Concepts, 9 edition, John Wiley & Sons, Inc. , 2013.
2. Andrew Tannenbaum, Modern Operating Systems, 4 edition, Pearson, 2014.
3. William Stallings, Operating Systems – Internals and Design Principles 8 edition , Prentice Hall, 2014.
4. Лилян Николов, Операционни системи 6 изд., Сиела, 2009 г

DESCRIPTION OF THE COURSE

Name of the course Programming languages	Code: BCSCe23	Semester: 3
Type of teaching: Lectures and laboratory work	Lessons per week: L – 2 hours; LW – 2 hours	Number of credits: 5

LECTURER:

Prof. Ph.D. D. Gotseva (FCST) – 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 course is to teach the students with the algorithmic and assembler programming languages regardless of their environment. The accent of the course is upon the syntax and semantics of the language constructs. Different approaches are presented for achieving a given aim and the advantages and the disadvantages of the concrete implementations.

DESCRIPTION OF THE COURSE: The main topics concern: The alphabet – basic and extend, Identifiers, Constants-literal and named, different type of constant present – numeric, character, string, logic, Comments, Directives, Data classifications, Definition and declaration, Storage specifiers, Declarator – different kinds, complex declarator – reading rules, abstract declarator – typed names, specific modifiers, Integers, real, characters, enumerated data – type specifiers, value range, inner presenting, Arrays – arrange arrays into memory, pointers, relationship between arrays and pointers. Structures and unions, Expressions in C – operands, rules of precedence, execution of the operators, side effects, data conversion (usual arithmetic conversion and assignment conversion), Statements in C, Structure and execution of C program, Multiple files structure, Calling functions, Parameters of **main** function, etc.

PREREQUISITES: Computing I, Computing II, basic knowledge of algorithms

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

METHOD OF ASSESSMENT: One 1.5-hour assessment at end of semester (60%), laboratories (20%), course work (00%)

INSTRUCTION LANGUAGE: English

BIBLIOGRAPHY: 1. <http://dgotseva.com> – course materials.

2. Kerningan, B., D. Ritchi. The C Programming Language, Prentice_hall, 2007.

3. <http://www.cprogramming.com/>.

4. <http://cprogramminglanguage.net/>.

5. <http://www.cs.cf.ac.uk/Dave/C/CE.html>.

DESCRIPTION OF THE COURSE

Name of the course Databases	Code: BCSCe24	Semester: 3
Type of teaching: Lectures and laboratory work	Lessons per week: L – 2 hours; LW – 2 hours	Number of credits: 5

LECTURER:

Prof. Ph.D. D. Gotseva (FCST) – 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 this course is to provide the basis for a solid education in the fundamentals of database technology and to show the way in which this field is currently developing and is likely to develop in the future.

DESCRIPTION OF THE COURSE: The main topics concern: Introduction into Databases (DB), Basic terms and concepts, DB architecture, Users and DB administrators, External view, conceptual view and internal view of DB, Mapping, Database Management System (DBMS), Data redundancy, Data integrity, Data analysis and its life cycle, Entity-Relationship (ER) modeling, Entities, Attributes, Primary and foreign keys, Candidate keys, Relationships and their characteristics, ER diagram creating, Problems with ER models, Enhanced ER models (EER), ER/DB relations mapping, DB normalization, Normal forms: 1NF, 2NF, 3NF, BCNF, 4NF, and 5NF, DB models, SQL basics, CREATE statements, SELECT statement, Joining tables in SELECT statement, Aliases, Subqueries, UNION, MINUS, and INTERSECT clauses, Views, Working with views, INSERT, UPDATE, and DELETE statements, Transactions, Concurrency and transactions, Transaction schedules, „Lost updates” scenario, Uncommitted dependency, „Inconsistency” scenario, Serialization, Concurrency, Locking mechanism, Deadlock, Two-phase locking, Security, DBMS level protection, GRANT statement, etc.

PREREQUISITES: Computing I, Computing II, Programming Languages

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

METHOD OF ASSESSMENT: Written exam (80%), laboratory works (20%).

INSTRUCTION LANGUAGE: English

BIBLIOGRAPHY: 1. <http://dgotseva.com> – course materials. 2. Elmasri and Navathe, Fundamentals of Database Systems, Addison Wesley, 2010. 3. Abraham Silberschatz, Henry Korth, S. Sudarshan, Database System Concepts, McGraw-Hill Science/Engineering/Math, 2010. 4. Nenad Jukic, Susan Vrbsky, Svetlozar Nestorov, Database Systems: Introduction to Databases and Data Warehouses, Prentice Hall, 2013. 5. Database Design. Know it all, Elsevier, 2009. 6. Pro SQL Server 2008. Relational Database, Design, and Implementation, Après, 2009. 7. Dyer, R. MySQL in a Nutshell, O'Reilly, 2008. 8. Larry Rockoff, Data Analysis with Microsoft Access 2010: From Simple Queries to Business Intelligence, Cengage Learning PTR, 2011.

DESCRIPTION OF THE COURSE

Name of the course: English for Computing	Code: BCSCe25	Semester: 3
Type of teaching: Laboratory work	Lessons per week: LW – 2 hours	Number of credits: 2

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: Networks, A Closer Look at Networks, The OSI Reference Model, Issues of Security, The Internet. 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 Computer Periphery	Code: BCSCe26	Semester: 4
Type of teaching: Lectures and Laboratory work	Lessons per week: L – 2 hours, LW – 1 hours	Number of credits: 4

LECTURER:

Assoc. Prof. Sergey Nedev, Ph.D. (FCST), tel.: 965 3525, email: s_nedev@tu-sofia.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: This course is compulsory for the students from the speciality Computer Science and Engineering in the bachelor programme of the Faculty of Computer Systems and Control.

AIMS AND OBJECTIVES OF THE COURSE: The general aim of this course is to make students familiar with the logical structure and organization of the peripheral devices (printers, plotters, HDDs, CDs, DVDs, monitors, etc.) as a part of the state-of-the-art computer systems as well as with the information media carriers applied.

DESCRIPTION OF THE COURSE: The following topics are included in the course content: physical presentation of information over different physical carriers, faults detection and correction during the process of storage of information, organization of write/read operations in devices which use magnetic-media carriers, methods for registration of visual information, organization of write operation using indication, optical disks based memories, organization of the read process from the carriers of visual information, reliability of computer periphery, etc.

PREREQUISITES: The subject has the input links with the following disciplines: Physics, Chemistry, Machine Mechanics, Materials Science, Theoretical Electrical Engineering.

TEACHING METHODS: Lectures, presented using additional technical tools. The laboratory exercises output with protocols.

METHOD OF ASSESSMENT: Two one-hour written tests at the middle and at the end of the semester (80%) and laboratories (20%).

INSTRUCTION LANGUAGE: English.

BIBLIOGRAPHY: 1. Dakovski L., Computer periphery, e-book. 2. Rosch ., W. L., Hardware Bible, Sixth Edition, Que Publishing, 0-7897-2859-1, 2003. 3. Rosenthal, J., K. Irwin, PC Repair and Maintenance: A Practical Guide, 1584502665, Charles River Media, 2004. 4. Bhambri P. Computer Peripherals and Interfaces. LAP LAMBERT, 2013. 5. Mueller S. Upgrading and Repairing PCs. Que Publishing, 2013. 6. Hitachi Data Systems Academy. Storage Concepts. HDS Academy, 2012. 7. Poynton C. Digital Video and HD. Morgan Kaufmann, 2012. 8. Stan S. The CD-ROM Drive: A Brief System Description. Springer, 2010.

DESCRIPTION OF THE COURSE

Name of the course: HIGH PERFORMANCE COMPUTER SYSTEMS	Code: BCSCe27	Semester: 6
Type of teaching: Lectures, Laboratory Work, CW / CP	Hours per week: L – 2 hours, LW – 2 hours	Number of credits: 5

LECTURER:

Assoc. Prof. PhD Valentin Hristov (FCSC), v_hristov@tu-sofia.bg, TU-Sofia
Assoc. Prof PhD Iva Nikolova (FCSC), email: inni@tu-sofia.bg, TU-Sofia

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

AIMS AND OBJECTIVES OF THE COURSE: The aim of the course is students to learn and be able to apply the main architectural styles in the design of high-performance computer systems and complexes.

DESCRIPTION OF THE COURSE: Main topics: Taxonomy. Scalable high-performance computer systems. Vector processors. Massive parallel processors. Clusters of servers and workstations. Symmetrical and CC-NUMA multiprocessors. System interconnection networks for high-performance computer systems and complexes. Supercomputers.

PREREQUISITES: Computer Architectures, Operating Systems, Digital Circuits, Analysis and Synthesis of Logic Circuits.

TYPE OF TEACHING: Lectures using video-presentation with beamer, laboratory works end with presentation of the results, parallelism profiles and estimation of the performance parameters of the parallel system for the certain task.

METHOD OF ASSESSMENT: Exam during the exam session two academic hours in with a max score of 60 points based on the exam results.

LANGUAGES OF INSTRUCTION: English.

BIBLIOGRAPHY:

8. Lecture presentations in eLearning platform „Moodle“ (cs.tu-sofia.bg)
9. Duato, J., Yalamanchili, S., Lionel M., (2012) Interconnection networks: an engineering approach. Morgan Kaufmann Publishers, ISBN 1-55860-852-4
10. Rajkumar Buyya, High Performance Cluster Computing, Prentice Hall © 2011
11. Rezaur Rahman, Intel® Xeon Phi™ Coprocessor Architecture and Tools: The Guide for Application Developers, book, ISBN-13: 978-1430259268, 2013
12. Weygant P., Clusters for High Availability, Prentice Hall © 2010.
13. TOP500 (<https://www.top500.org/>)

DESCRIPTION OF THE COURSE

Name of the course: Development of Linux-based Software	Code: BCSCe28	Semester: 4
Type of teaching: Lectures and Laboratory exercises	Hours per week: L – 2 hours; LE – 2 hours	Number of credits: 4

LECTURER:

Prof. PhD Daniela Gotseva (FCST), tel. 965 23 38; 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 course aims to give students basic knowledge and skills to apply the approaches, methods and tools for programming in real time as teach the basics of construction and realization of basic mechanisms in programming with a low level in UNIX like systems, the characteristics of the establishment of processes and threads in the language C.

DESCRIPTION OF THE COURSE: The main topics concern: file system - tips, organization, attributes, security, input / output system - flows. Programming in C / C + +; Processes, threads, synchronization; Interaction between processes - messages, semaphores, shared memory, network programming concepts. Client-server programs communication organisation. Network programming in C. Special attention take for UNIX/Linux OS: basic shell commands, shell programming, utility programming.

PREREQUISITES: Basic knowledge in structure and functionality of computer devices and system, programming language C/C++, software engineering.

TEACHING METHODS: Lectures (using slides, multimedia projector) and text materials.

METHOD OF ASSESSMENT: One assessment at the end of the semester (80%) and exercises (20%).

INSTRUCTION LANGUAGE: English

BIBLIOGRAPHY: 1. <http://dgotseva.com> – course materials. 2. Nikolov, L. UNIX. System Programming. Siela, 2009. 3. Robbins, K., S. Robbins. UNIX Systems Programming, Prentice-Hall, 2003. 4. Love, R., LINUX. System Programming, O'Reilly, 2007. 4. Randal E. Bryant, David R. O'Hallaron, Computer Systems. A Programmer's Perspective, 2001.

DESCRIPTION OF THE COURSE

Name of the course Object-Oriented Programming	Code: BCSCe27	Semester: 4
Type of teaching: Lectures and laboratory work	Lessons per week: L – 2 hours; LW – 2 hour	Number of credits: 5

LECTURER:

Prof. Ph.D. Ognian Nakov (FCST) – tel.: 965 25 36, email: nakov@tu-sofia.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory for the students in Computer science and engineering in bachelor programme of the Department of Computer Systems.

AIMS AND OBJECTIVES OF THE COURSE: At the end of the course the students are expected to be able to understand object-oriented programming and design technology and practical skills – how to use class libraries, how to define a class of objects using concrete object-oriented programming language.

DESCRIPTION OF THE COURSE: The course objectives is to acquaint students with the object-oriented conception, basic ideas and their realization in different object-oriented programming languages; to teach object-oriented analysis and design; to give object-oriented programming training, using class libraries for an individual design which consists of number of classes.

PREREQUISITES: Some programming languages and program algorithms.

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

METHOD OF ASSESSMENT: Two assessments, laboratories, course work

INSTRUCTION LANGUAGE: Bulgarian

BIBLIOGRAPHY:

1. Stroustrup, B. The C++ Programming Language, 4th Edition. Addison-Wesley Professional, 2013.
2. Prata, S. C++ Primer Plus (6th Edition), Addison-Wesley Professional, 2011.
3. Stroustrup, B. Programming: Principles and Practice Using C++ (2nd Edition). Addison-Wesley Professional, 2014.
4. Meyers, S. Effective C++: 55 Specific Ways to Improve Your Programs and Designs (3rd Edition), Addison-Wesley Professional, 2005.
5. Допълнителна литература:
6. Malik D. S. C++ Programming: From Problem Analysis to Program Design. Cengage Learning; 6 edition, 2012.
7. Deitel P., H. Deitel. C++ How to Program (Early Objects Version) (9th Edition), Prentice Hall; 9 edition, 2013.
8. <http://www.cplusplus.com/doc/tutorial/>

DESCRIPTION OF THE COURSE

Name of the course: Computer Networks	Code: BCSCe30	Semester: IV
Type of teaching: Lectures and laboratory work	Lessons per week: L – 2 hours; LW – 2 hours	Number of credits: 5

LECTURERS:

Associate Prof., PhD Georgi Naydenov (FCST)
tel.: 965 21 94, e-mail: gnayd@tu-sofia.bg
Technical University of Sofia

Associate Prof., PhD Petko Stoyanov (FCST)
тел. 965 2194, e-mail: pss@tu-sofia.bg
Technical University of Sofia

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

AIMS AND OBJECTIVES OF THE COURSE: The aim of the course is to acquaint students with the basic principles, standards and tendencies of development in the field of computer networks. This will help them in future to professionally solve system tasks in the area of network communications.

DESCRIPTION OF THE COURSE: The course discusses the problems concerning design, building and application of computer networks. The lectures begin with introduction to computer networks, principles of building, historical development and their contemporary classification. Open system interconnection model of ISO is presented. Teaching course includes basic principles of building and functioning of Local Area Networks (LAN) illustrated by practical technical solutions in LAN Ethernet. The lectures on the most popular in the world computer network Internet present its basic characteristics, principles of functioning and application. The laboratory work helps to better rationalization of lecture material and contribute to formation of practical skills.

PREREQUISITES: Basic knowledge in informatics.

TEACHING METHODS: Lectures with slides, multimedia projector and additional text materials; laboratory work based on instructions with a tutorial for every laboratory theme.

METHOD OF ASSESSMENT: Final mark is based on a written examination during the exam session with duration two academic hours in the end of the fourth semester. Students must answer 40 questions concerning the lectures and the laboratory works.

INSTRUCTION LANGUAGE: English.

BIBLIOGRAPHY:

- Tanenbaum A., Computer Networks, Prentice Hall PTR, 4th edition
- Douglas C., Computer Networks and Internets, Prentice Hall PTR, 5th edition
- Peterson L., Davie B., Computer Networks, ELSEVIER, 4th edition
- Scott Phil, Computer Networks Lectures, <http://ironbark.bendigo.latrobe.edu.au/>

DESCRIPTION OF THE COURSE

Name of the course: Programmable Logic Systems	Code: BCSCe31	Semester: IV
Type of teaching: Lectures and laboratory work	Lessons per week: L-2h, LW- 2h.	Number of credits: 5

LECTURER:

Assoc. Prof. Ph.D. Peter Manoilov (FCST), tel.: 965 -2484, email : p.manoilov@mail.bg
Technical University of Sofia

COURSE STATUS IN THE CURRICULUM: Compulsory for regular education of the student specialty "*Computer science and engineering*", Bachelor degree, Faculty of Computer Systems and Technologies, Technical University of Sofia.

AIMS AND OBJECTIVES OF THE COURSE: The aim of this course is to give knowledge and skills in the area of CAD design and implementation of computer units and systems on the contemporary programmable logic devices (integrated circuits).

DESCRIPTION OF THE COURSE: The syllabus considers the basic topics of the theory and practice of programmable logic devices design and utilization: types of programmable logic, hardware design and development, hardware description languages (HDL), design methodology and CAD systems for hardware and software co-design and implementation on contemporary programmable logic devices.

PREREQUISITES: Basic knowledge on microelectronics, combinatorial and sequential logic devices, digital circuit design, computer architectures, programming languages.

TEACHING METHODS: Lectures, using black/white board and slide presentations, laboratory work, using PC-based CAD systems and programmable VLSI chips on reference boards.

METHOD OF ASSESSMENT: Written work during the semester(forms 70% of the final mark) and laboratory work (forms 30% of the final mark).

INSTRUCTION LANGUAGE: English

BIBLIOGRAPHY:

1. Carter J. - *Digital Designing with Programmable Logic Devices* Prentice-Hall, 2003.
2. Salcic Z., [A. Smailagic](#) - *Digital Systems Design and Prototyping: Using Field Programmable Logic and Hardware Description Languages*, Springer, 2005
3. [Navabi](#) Z. - *Digital Design and Implementation with Field Programmable Devices (Information Technology: Transmission, Processing & Storage)*, Springer, 2004
4. Weste N., K. Eshraghian - *Principles of CMOS VLSI Design*, Addison-Wesley Publishing, Second edition, 2001.
5. Armstrong J. – *Structured Logic Design with VHDL*, Prentice-Hall, 1998.
6. Lipsett R. – *VHDL: Hardware Description and Design*, Addison-Wesley Publishing, 1999.

DESCRIPTION OF THE COURSE

Name of the course: English for Computing	Code: BCSCe32	Semester: 4
Type of teaching: Laboratory work	Lessons per week: LW – 2 hours	Number of credits: 2

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: Programming Languages, Robotics, Expert Systems, Icons and Commands, Electronic Mail, The Electronic Mail Box, Word Processing. 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.

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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.