Name of the course	Code: BCS34	Semester: 5
Organization of Computers		
Type of teaching:	Lessons per week:	Number of credits: 5
Lectures and	L - 2 hours;	
Laboratory work	LW – 2 hour;	

LECTURER: Prof. PhD Grisha Spasov tel.: 659 724,

E-mail: : gvs@tu-plovdiv.bg, Technical University of Sofia, branch Plovdiv

**<u>COURSE STATUS IN THE CURRICULUM</u>**: Compulsory subject for full-time students in the major of "Computer Systems and Technologies" of the Faculty of Electronics and Automation, Technical University of Sofia, branch Plovdiv,. B.Sc. program.

**AIMS AND OBJECTIVES OF THE COURSE:** The purpose of the course is to provide students with knowledge of the structure, organization and architecture of a computer system and its data processing as a process.

**DESCRIPTION OF THE COURSE:** The main topics concern: Structure, organization and architecture of a computer system. Von Neumann Architecture. Computer Classification. Technical and Economical Characteristics of Computers. Mathematical, Logical and engineering bases of computer organization. Computer processing, description system – PMS. Program control. Data set and command set . Computer operation structures. Binary Adders. Computer control structures Automats. Computer memory. Computer processors. Central Control Unit. Arithmetical Logical Unit. CISC and RISC. Scalar and Pipelined Processors with Prinstans and Harwards architecture. Coprocessors. Input-output of data in computers.

**PREREQUISITES:** Analysis and design of logic circuits, Operating Systems.

**TEACHING METHODS**: Lectures, using slides and multimedia presentations, laboratory work, using demo-programs, protocols preparation and defense.

**METHOD OF ASSESSMENT:** Written exam with test on the theory and written work on problems. The final grade is constructed on the exam results (totally 80%) and the protocols from the laboratory work (20%).

**INSTRUCTION LANGUAGE:** Bulgarian.

# **BIBLIOGRAPHY:**

1. William Stallings, "Computer Organization and Architecture. Designing for Performance", Eighth Edition. Pearson Prentice Hall, 2010, ISBN: 978-0-13-607373-4.

2. Andrew S. Tanenbaum and Todd Austin, "Structured Computer Organization" 6th Edition, Pearson Education, 2012, ISBN: 978-0132916523.

3.David A. Patterson, John L. Hennessy, "Computer Organization and Design", Elsevier, 2012, ISBN: 978-0-12-374750-1.

Name of the course: <b>Microprocessors</b>	Code: BCS35	Semester: 5
Type of teaching: Lectures and laboratory work	Lessons per week: L – 2 hours; LW – 2 hour	Number of credits: <b>5</b>

LECTURERS : Prof. Grisha Spasov PhD (FEA), tel.: 659 724, e-mail: gvs@tu-plovdiv.bg

**COURSE STATUS IN THE CURRICULUM**: Compulsory for the students specialty "Computer Systems and Technologies" B.Sc. programe of the Faculty of Electronics and Automatics, Technical University of Sofia, branch Plovdiv.

**AIMS AND OBJECTIVES OF THE COURSE**: At the end of the course the students are expected to have knowledge for microprocessors, their registers, instruction set, addressing modes, Input/Output interfacing techniques and simple assembly programming.

**DESCRIPTION OF THE COURSE**: The main topics concern: Introduction in CPU organisation and operation, instruction fetch-decode-execute cycle. CPU – programming model, registers, instruction set and addressing modes. Assembly-language programming. Interfacing to input and output devices. Interrupts and interrupt service routine. Input/output techniques. Microcomputer Bus structure, cycles, types and characteristics.

**PREREQUISITES**: Basic knowledge in the area of Digital electronics and Programming Languages.

**TEACHING METHODS**: Lectures, using slides and multimedia presentations, laboratory work, using demo-programs, protocols preparation and defence.

**METHOD OF ASSESSMENT**: Written exam with test on the theory and written work on problems. The final grade is constructed on the exam results (totally 90%) and the protocols from the laboratory work (10%).

**INSTRUCTION LANGUAGE**: Bulgarian.

**BIBLIOGRAPHY**: 1. Спасов Г.,Петрова Г., Костадинов А. Цифрова и микропроцесорна техника, ТУ-София, 2012, ISBN: 978-619-167-007-9, 2012. 2. Jonathan W. Valvano, "Introduction to Embedded Systems. Interfacing to the Freescale 9S12", Cengage Learning 2010, ISBN-10: 0-495-41137-X. 3. Tim Wilmshurst, "Designing Embedded Systems with PIC Microcontrollers", Elsevier 2010, ISBN: 978 1 85617 750 4. 4. Steven F. Barrett, Daniel J. Pack," Atmel AVR Microcontroller Primer: Programming and Interfacing", Morgan & Claypool Publishers, 2012, ISBN: 9781608458615.



Name of the course	Code: BCS36	Semester: 5
Computer peripherals		
Type of teaching: Lectures, laboratory work	Lessons per week: $L - 2$ hours; $LW - 1$ hour	Number of credits: 5

### LECTURER:

Assist. Prof. PhD Boris Ribov (FEA), Dept. CST. tel.: 659 757 , Email: ribov@developer.bg Technical University of Sofia, branch Plovdiv

**<u>COURSE STATUS IN THE CURRICULUM</u>**: Compulsory course for the students in BSc program in Computer systems and technologies.

<u>AIMS AND OBJECTIVES OF THE COURSE</u>: The aim of the course is to create knowledge about the computer hardware and peripherals.

**DESCRIPTION OF THE COURSE:** The course covers: power supply in the computer systems, storage devices (Hard disk, SSD, NOR & NAND Flash memory), optical storage devices, printers, scanners, multimedia audio and video devices, monitors, video controllers, communication controllers (USB, RS232, RS485, Firewire, COM, LPT), etc.

**PREREQUISITES:** Good fundamental knowledge in the courses: Computer architectures, Microprocessor techniques, Operating systems and Programming languages.

**TEACHING METHODS**: Lectures and laboratory work using multimedia projector.

**METHOD OF ASSESSMENT:** One test examine at the end of the course.

**INSTRUCTION LANGUAGE:** Bulgarian

## **BIBLIOGRAPHY:**

1. Pankaj Bhambri, Computer Peripherals and Interfaces, LAP Lambert Academic Publishing, 2013

2. Thomson R. B.; Thomson B.F.; PC Hardware in Nutshell. Thirt eition, O'Reilly, 2003

3. Barry M. Cook & Neil White, Computer Peripherals. Third edition, British Library Cataloguing in Publication Data, UK 1995.

4. (In Bulgarian) Иларионов, Р. Т. Компютърна периферия, Алмаматер Интернационал С., 2008

5. (In Russian) Гук, М. Интерфейсы ПК: Справочник Санкт-Перебург: Питер, 1999.

Name of the course: <b>Databases</b>	Code: BCS37	Semester: 5
Classes:	Lessons per week:	Credits: 5
Lectures,	L - 2 hours,	
Laboratory work	E - 2 hours	

### **LECTURER:**

Assoc. Prof. PhD Ivaylo Atanassov (FEA) – tel.: 659 729, email: <u>ivo\_atan@tu-plovdiv.bg</u>, Technical University of Sofia, branch Plovdiv

**COURSE STATUS IN THE CURRICULUM:** Mandatory discipline for "Computer systems and technologies", faculty of "Electronics and automatics", Technical University – Sofia, branch Plovdiv, bachelor degree

**AIMS AND OBJECTIVES OF THE COURSE:** The "Databases" course aims to give students the basics of database systems – structure and functioning. The main topics of studying are relational algebra, data presentation with entity – relationship model, with relational model, data manipulation and definition with SQL.

**DESCRIPTION OF THE COURSE**: Main topics: Database systems basics and principles – independency and separation of program and data. Entity – relationship model. Relational model – notion of attribute, domain, null, record, relation. Scheme and relation instance. Relational calculus. SQL – principles of the SQL standard. Language structure. Data manipulation and definition.

**<u>PREREQUISITES</u>**: Discrete structures, Synthesis and analysis of algorithms, Operating systems

**TEACHING METHODS:** Lectures, exercises on the main topics, solving assignments related to the operating systems.

**METHOD OF ASSESSMENT**: The final mark is composed from the: students participation in the exercises, the examination test

**INSTRUCTION LANGUAGE:** Bulgarian

## **BIBLIOGRAPHY**:

1. Elmasri, R., Fundamentals of Database Systems, 6th Ed, Addison-Wesley, 2010

2. Date, C., An Introduction to Database Systems, 8th Ed, Addison-Wesley, 2003

3. Silberschatz, A., H. Korth, S. Sudarshan, Database System Concepts, McGraw-Hill, 2010

4. Kline, K., B.hunt, D. Kline, SQL in a Nutshell, O'Reilly, 2008

Name of the course:	Code: BCS38	Semester: 5
Programming languages		
Type of teaching:	Lesson per week:	Number of credits: 5
Lectures, Laboratory work,	Lectures – 2 hours,	
course work	LW – 2 hours	

### LECTURER:

Assoc. Prof. PhD Ivaylo Atanassov (FEA) – tel.: 659 729, email: <u>ivo\_atan@tu-plovdiv.bg</u>, Technical University of Sofia, branch Plovdiv

**<u>COURSE STATUS IN THE CURRICULUM</u>**: Mandatory course for students in Computer Systems and Technologies, B.Sc. programme of the Faculty of Electronics and Automatics, Technical University of Sofia, branch Plovdiv..

**AIMS AND OBJECTIVES OF THE COURSE:** The discipline aims at making students aware and acquire systematical knowledge in the field of the programming languages, as general and specific elements of the particular languages are being revealed, as well as implementation of different paradigms and features laid down in the basis of the up-to-date programming languages.

**DESCRIPTION OF THE COURSE:** Methods for realization of the programming languages, types of data, their variety and internal presentation have been reviewed in the beginning of the course. After that, it has been dwelt on the language tools for declaration of data, control structures and kinds of expressions in different languages. Various kinds of programme structures: block, modular & packet, object, class and component ones, models of the memory, subroutines and modes for parameter transmission are the core of the course. The specific features in parallel programming have been considered in the next several topics. Examples in Pascal, C, C++, Java, Ada, Modula-2, Fortran, Prolog, Lisp, Aceмблер and HTML have been illustrated during the course. The laboratory exercises and workshops are targeted towards accumulation of knowledge in the programming language Java.

**PREREQUISITES:** PCU-I, PCU-II, Data structures, Discreet structures, Analysis and synthesis of algorithms .

TEACHING METHODS: Lectures and tutorials.

**METHOD OF ASSESSMENT**: The overall grade is an aggregation of the two tests grades (80%) and the defense grade of a particular problem solution (20%).

## **INSTRUCTION LANGUAGE:** Bulgarian.

**<u>BIBLIOGRAPHY</u>:** 1. Плачков Ив., "Програмни езици и програмни системи – Инженерен подход", Унисофт, Пловдив, 1998; 2. Плачков Ив., "Ръководство по програмни езици – Програмиране на езика Java", Унисофт, Пловдив, 1999;

3. Kathy Sierra, Bert Bates, "Java2 Sun cartified programmer & developer.Study guide"

4. Саймън Робърдс, Филир Хелър, "Java2 Пълно ръководство за сертифициране"

Name of the course	Code: BCS39	Semester: 5
Digital design		
Type of teaching: Lectures and laboratory work	Lessons per week: L – 2 hours; LW – 2 hour	Number of credits: 5

### LECTURER:

Assoc. Prof. PhD Atanas Kostadinov, Computer systems and Technologies Department, Technical University – Sofia, branch Plovdiv, Phone: + 359 32 659 726 email: kostadat@tu-plovdiv.bg.

**<u>COURSE STATUS IN THE CURRICULUM</u>**: A compulsory subject for the Computer Systems and Technologies students admitted to the bachelor program. Computer Systems and Technologies Department belongs to the Electronics and Automation Faculty (EAF). EAF is a part of the Technical University – Sofia, Plovdiv branch.

**AIMS AND OBJECTIVES OF THE COURSE:** The main goal of the above-mentioned subject is the receiving of knowledge and applying of this knowledge for analyzing, modeling and design of any digital circuits and devices. Based on the learned material in this field the students are able to get new information about concrete digital system according their future job requirements. The objectives of this course are:

- Know basic terms used in the digital design;

- Learn working principles of various digital circuits and devices;

- Compare and classify those circuits using different parameters and characteristics.

**DESCRIPTION OF THE COURSE:** The main topics covered in this course are the next: Different logic gates and their truth tables; Different counter types. Frequency dividers; Register and shift register – the main purposes and parameters. LFSR – Linear Feedback Shift Register; Transistor-transistor Logic (TTL) – characteristics and parameters. The basic TTL circuit; Different TTL logic components – expanders, with open collector, three state circuits; Advanced TTL logic - AS, ALS and FAST; CMOS logic – parameters and characteristics; Advanced CMOS logic; BiCMOS logic. Voltage translation between different types of logic; RC differentiator and integrator; Monostable multivibrator; Schmitt trigger; Oscillators. RC oscillators. Crystal clock oscillators; Digital-to-Analog Converters (DACs) – parameters and characteristics. Different types of DAC; Analog-to-Digital converters (ADCs) – parameters and characteristics. Different types of ADC; Reconfigurable logic – historical path. Contemporary programmable integrated circuits (ICs) used in the design process; Hardware desrition languages – VHDL, Verilog, SystemC. Programmable ICs produced by Xilinx and Intel (Altera).

**PREREQUISITES:** The prerequisites subjects are FBE22 Semiconductor Electronic Components and BCS 31 Analysis and Synthesis of Logic Circuits.

**TEACHING METHODS**: The lectures presented the above material using slides and multimedia projector. In the laboratory exercises small groups of students design and test concrete digital circuits and devices.

**METHOD OF ASSESSMENT:** The final mark consists of two parts. One part is formed by the written exam (multiplied by 0.9). Another part is derived from laboratory exercises work (multiplied by 0.1).

Laboratory exercises part of the final mark is based on the knowledge demonstrated by the students during labs.

The written exam consists of 6 different tasks connected to the analysis and synthesis of digital circuits. There is an opportunity to be selected one or another task to be solved by the students during examination.

# **INSTRUCTION LANGUAGE:** Bulgarian

# **BIBLIOGRAPHY:**

1. Mihov G. Digital Design (in Bulgarian), TU-Sofia, 2010.

2. Spasov G., Petrova G., Kostadinov A., Digital and microprocessor systems design (in Bulgarian), TU-Sofia, 2012.

3. Vahid F., Digital design, with RTL design, VHDL and Verilog, second edition, John Wiley & Sons, 2011.

4. Haris D., Haris S., Digital design and computer architecture, second edition, Morgan Kaufmann, 2013.

5. http://e-shell.tu-plovdiv.bg

6. http://www.ddvahid.com

Name of the course	Code: BCS40	Semester: 6
Computer architecture		
Type of teaching: Lectures, laboratory work	Lessons per week: $L - 2$ hours; $LW - 2$ hour	Number of credits: 6

### LECTURER:

Assoc. Prof. Ph.D. Maria Marinova (FEA), Dept. CST – tel.: 659 727, Technical University of Sofia, branch Plovdiv, e-mail: m\_marinova@tu-plovdiv.bg

**<u>COURSE STATUS IN THE CURRICULUM</u>**: Compulsory course for the students in BSc program in Computer systems and technologies.

**AIMS AND OBJECTIVES OF THE COURSE:** The aim of the course is to create knowledge about *Computer Architectures*: what is computer architecture and learn about basic components of modern processor architectures; out-of-order issue and execution in superscalar and multi-core processors; heterogeneous architectures and CUDA architecture.

**DESCRIPTION OF THE COURSE:** Computing model and architecture; "hot spots" in processors; cache memory – functions of mapping, cache coherent protocols, placement polices, logical and physical caches; virtual organization – work with cache system; superscalar processors – instruction level parallelism, instruction dependencies, issue polices, organization of register files; ROB; architectures with thread-level parallelism; historical view of different project for non-traditional architectures (multiscalar, pre-execution, speculative execution, slip-stream, PIM); multi-core architectures, simultaneous multithreading vs hyper threading; datapath of execution of instructions; types of branch instructions, different branch predictors; heterogeneous processors with GPUs.

**PREREQUISITES:** Good fundamental knowledge in the course: Computer Organization.

**TEACHING METHODS**: Lectures and laboratory work. For laboratory exercises we use simulation tools SimpleScalar, Sniper and SMPCache.

**METHOD OF ASSESSMENT:** Final mark is form like takes value of mark of test (78%) and laboratory work (22%).

## **INSTRUCTION LANGUAGE:** Bulgarian

## **BIBLIOGRAPHY:**

- 1. J. Hennessay, D. Patterson, Computer Architecture. A Quantum Approach. 2013.
- 2. D. Patterson, J. Hennessay, Computer Organization and Design. The Hardware/Software Interface.2014
- 3. W. Stallings, Computer Organization and Architecture, Design for Performance. Ninth Edition. 2013
- 4. L. Null, J. Lobur, The Essentials of Computer Organization and Architecture, 2010
- 5. D. Harris, S. Harris, Digital Design and Computer Architecture, Second Edition. 2013
- 6. J. Shen, M. Hipasti, Modern Processor Deign. Fundamentals of superscalar Processors. 2005
- 7. SimpleScalar: <u>http://www.simplescalar.com/</u>
- 8. SMPCache : <u>http://arco.unex.es/smpcache/</u>

Name of the course:	Code: BCS41	Semester: 6
Programming environments		
Type of teaching:	Lesson per week:	Number of credits: 6
Lectures, Laboratory work, course	L - 2 hours,	
work	LW – 2 hours	

#### LECTURER:

Assoc. Prof. PhD Velko Iltchev (FEA) – iltchev@tu-plovdiv.bg, GSM: 0895-587475, Technical University of Sofia, branch Plovdiv

**COURSE STATUS IN THE CURRICULUM:** Elective course for students in Computer Systems and Technologies, B.Sc. programme of the Faculty of Electronics and Automatics, Technical University of Sofia, branch Plovdiv.

**AIMS AND OBJECTIVES OF THE COURSE:** The students will gain learning as regards: the process of building of the Windows based applications, using of MFC library and its classes. The students are introduced to MS VC++ 6.0 integrated development environment and its ability of building different kinds of Windows based applications.

**DESCRIPTION OF THE COURSE:** Main topics: Windows programming model. Integrated development environment VC++, MFC library and base classes description. Overview of Win32 API. Message handling – messages, message queue, message loop. Document/view architecture – SDI and MDI applications. Device context and visual representation of data objects. Modal and modaless dialog boxes. Common dialog boxes. Common Windows controls. ActiveX controls. Multi-threaded programming – kernel threads, user threads, synchronization.

**PREREQUISITES:** PCU-I, PCU-II, Data structures, Analysis and synthesis of algorithms, Programming languages.

**TEACHING METHODS:** Lectures and tutorials.

**METHOD OF ASSESSMENT**: Written tests during the semester consisting in solving of problems. The overall grade is an aggregation of the test grades (80%) and the defense grade of a particular problem solution (20%).

#### **INSTRUCTION LANGUAGE:** Bulgarian.

**BIBLIOGRAPHY::** 1. Круглински Д., "VC++6.0 Поглед отвътре"; 2. Плачков Ив., "Програмни езици и програмни системи – Инженерен подход", Унисофт, Пловдив, 1998; 3. Petzold Charles., "Programming Windows, Fifth Edition"; 4. Prosise J., "Programming Windows with MFC, Second Edition".

Name of the course: <b>Microprocessor systems</b>	Code: <b>BCS42.1</b>	Semester: 6
Type of teaching: Lectures and laboratory work	Lessons per week: L – 2 hours; LW – 2 hour	Number of credits: <b>4</b>

**LECTURER :** Prof. Grisha Spasov PhD (FEA ), tel.: 659 724, e-mail: gvs@tu-plovdiv.bg Technical University of Sofia, branch Plovdiv

**COURSE STATUS IN THE CURRICULUM**: Compulsory for the students specialty "Computer Systems and Technologies" B.Sc. programme of the Faculty of Electronics and Automatics, Technical University of Sofia, branch Plovdiv.

**AIMS AND OBJECTIVES OF THE COURSE**: At the end of the course the students are expected to have knowledge for microprocessors Pentium/x86, assembler for 80x86, architecture of PC based microcomputers, PC interfaces, development of input/output drivers.

**DESCRIPTION OF THE COURSE**: The main topics concern: Introduction in CPU organisation and operation. Pentium/x86 architecture: programming model, registers, memory models, addressing modes, instructions. Assembler for 80x86, simple assembly programming.

Pentium/x86 interrupt model. Input and output: device types and characteristics, controllers, ports, programmed I/O, interrupts, DMA. Bus structure: ISA, PCI, chipsets. Development of simple device drivers.

**PREREQUISITES**: Microprocessor technique, Computer Architectures, Programming Languages.

**TEACHING METHODS**: Lectures, using slides and multimedia presentations, laboratory work, using demo-programs, protocols preparation and defence.

**METHOD OF ASSESSMENT**: Written exam with test on the theory and written work on problems. The final grade is constructed on the exam results (totally 80%) and the protocols from the laboratory work(20%).

**INSTRUCTION LANGUAGE:** Bulgarian.

**BIBLIOGRAPHY**: 1. <u>http://e-shell.tu-plovdiv.bg</u> » Факултет Елекртоника и Автоматика » Компютърни системи » Микропроцесорна техника. 2.<u>http://cst.tu-plovdiv.bg/moodle/</u> » Компютърни системи и технологии » Бакалаври » Микропроцесорни системи. 3.Гриша Спасов, Митко Шопов, Велислава Спасова, Николай Каканаков, "Ръководство за лабораторни упражнения по Микропроцесорни системи", ТУ София, 2013, ISBN: 978-619-167-021-5. 4.KIP R. IRVINE, "Assembly Language for x86 Processors", Sixth Edition, Pearson Higher Education 2011, ISBN-13: 978-0-13-602212-1. 5.Joseph Yiu, "The definitive guide to the ARM Cortex-M3", Elsevier Inc. 2010, ISBN 978-1-85617-963-8. 6.Intel® 64 and IA-32 Architectures Software Developer's Manual, "Volume 2 (2A, 2B & 2C):Instruction Set Reference, A-Z", Intel Corporation 2012..

Name of the course	Code: BCS43	Semester: 6
Information and Control Systems		
Type of teaching:	Lessons per week:	Number of credits: <b>4</b>
Lectures and laboratory work	L - 2 hours; $LW - 2$ hours	

### **LECTURER**:

Prof. PhD Veselka Boeva (FEA), tel.: 659 724, email: vboeva@tu-plovdiv.bg, Technical University of Sofia, branch Plovdiv

**<u>COURSE STATUS IN THE CURRICULUM</u>**: Optional course for third year students in Computer Systems and Technologies, B.Sc. programme of the Faculty of Electronics and Automatics, Technical University of Sofia, branch Plovdiv.

**AIMS AND OBJECTIVES OF THE COURSE:** Introduction to the systems analysis and design of computer-based information systems.

**DESCRIPTION OF THE COURSE:** The main topics concern: General systems theory – main principles. Basic concepts: systems, environment, systems and environment dynamics, systems architecture. Systems development of information systems. Systems approach to business organizations. Introduction to information systems: life cycle and systems development. Systems development phases. Preliminary Investigation – systems project requests, scope and contents of the problem, investigation of the feasibility, identification of the benefits, estimation of the time and costs, report to the management. Systems Analysis. Data collecting techniques. Data analysis and modelling. Identification of the hardware and software requirements. Systems requirement document. Project planning and control. Estimation of the benefits and costs. Estimation of the time: Gantt chats and PERT diagrams. Systems design: output, input and interface. Software systems design.

**PREREQUISITES:** Programming and Computer Applications II and III, Synthesis and Analysis of Algorithms, Databases.

**TEACHING METHODS**: Lectures, information visualization by a laptop and a multimedia projector, and laboratory work.

**METHOD OF ASSESSMENT:** Written test including theory questions and solving of particular problems.

#### **INSTRUCTION LANGUAGE:** Bulgarian.

**<u>BIBLIOGRAPHY:</u>** 1. K.E. Kendall, J.E. Kendal, *Systems Analysis and Design*, 8th ed., Prentice-Hall, 2011; 2. E. M. Awad, *System Analysis and Design*, <u>Galgotia</u>, 2010; 3. James A Senn, *Analysis and Design of Information System*, McGraw Hill International, 2003 4. J.L.Whitten, L.D. Bentley, <u>K. C. Dittman</u>, *System Analysis and Design Methods*, McGraw-Hill Irwin, 2004; 5. K. Крачанов, М. Стоева, *Информационни и управляващи системи*, том 1, УниСофт, Пловдив 1998; 6. К. Крачанов, М. Стоева, *Информационни и управляващи системи*, том 2, УниСофт, Пловдив 1998; 7. Roger S. Pressman, *Software Engineering: A practitioners Approach*, 7<sup>th</sup> ed., R. S. Pressman & Associates, Inc., 2010.



Name of the course	Code: BCS44	Semester: 6
Object-oriented programming		
Type of teaching:	Lessons per week:	Number of credits: 4
Lectures	Lectures – 2 hours	
Laboratory work	Laboratory work – 2 hour	

### LECTURER:

Assoc. Prof. Ph.D. Velko Ivanov Iltchev, Department of Computer Systems and Technologies, Technical University of Sofia, branch Plovdiv,

e-mail: iltchev@tu-plovdiv.bg, GSM: 0895-587475

**<u>COURSE STATUS IN THE CURRICULUM</u>**: Eligible for the students specialty "Computer Systems and Technologies" B.Sc. programme of the Faculty of Electronics and Automatics, Technical University of Sofia, branch Plovdiv.

<u>AIMS AND OBJECTIVES OF THE COURSE</u>: To introduce the students in object-oriented programming and to give them experience in development of software applications, using object-oriented programming languages and platforms.

**DESCRIPTION OF THE COURSE:** Main topics: Scope and visibility of variables. Member functions. Overloaded functions. Constructors and destructors. Special constructors. Creating and destroying complex objects: using member initialization lists, initialization order. Chaining constructor calls. Chaining destructor calls. Creating arrays of objects: destructors and arrays of objects, implicit array initialization via default constructor, partial array initialization. Creating and destroying dynamic objects. Static data members. Static member functions. Inline functions. Friend functions. Friend classes. Cooperated classes. Inheritance: inheritance versus composition, assignment compatibility rule. Polymorphism: static versus dynamic function binding, overriden versus virtual functions, virtual and nonvirtual function interaction, passing polymorphic objects as function arguments. Virtual constructors and destructors. Abstract classes. Operator functions: defining unary and binary operator functions through member and nonmember functions; restrictions on operator functions; using reference arguments in operator functions; assignment versus initialization; type conversion operator functions. Object-oriented and component programming in environments, which support events.

**PREREQUISITES:** PIC 3, Synthesis and Analysis of Algorithms.

**TEACHING METHODS**: Lectures - using multimedia presentations. Laboratory work - the students implement classical algorithm using object-oriented programming techniques.

**METHOD OF ASSESSMENT:** Two control tests: one in middle and one at the end of semester. The first control test has a ratio of 30% in the final assessment and the second one - a ratio of 50%. The laboratory work has a ratio of 20%.

## **INSTRUCTION LANGUAGE:** bulgarian

**BIBLIOGRAPHY: 1.** Stroustrup B., The C++ Programming Language (4-th Edition), Addison-Wesley, ISBN: 0-321-56384-0, 2013. **2.** Lippman S., The C++ Primer (5-th Edition), Addison-Wesley, ISBN: 0-321-71411-3, 2012. **3.** Calvert Ch., Borland C++ Builder 3 Unleashed, Sams Publishing, ISBN: 0-672-31265-4, 1998. **4.** Stahl H., Cross-Platform Development mit Delphi XE4 / XE5 & Firemonkey für Windows & MAC OS X, [Kindle Edition], Amazon Digital Services Inc., ASIN: B00GLVJRK6, 2013. **5.** http://www.open-std.org/jtc1/sc22/wg21/docs/papers/2012/n3337.pdf **6.** http://docs.embarcadero.com/products/rad\_studio/

### **COURSE DESCRIPTION**

Name of the course: Industrial management	Code: BCS45	Semester: 6
Type of teaching: Lectures, Seminar exercises	Lessons per week: $L - 2$ , SE-2	Number of credits: 4

**LECTURERS:** Associate Professor Toni Mihova, PhD, tel.: 032 659 714, email: expert2009@abv.bg, Sofia Technical University – Plovdiv Branch

**<u>COURSE STATUS IN THE CURRICULUM</u>**: An optional course for the students, majoring in Computer systems and technologies, Bachelor degree course.

<u>AIMS AND OBJECTIVES OF THE COURSE</u>: Learning the basics and the current state of the dynamic economic processes in order to enable students with the ability to analyze as a system the ongoing economic processes in the field of Computer systems and technologies.

<u>COURSE DESCRIPTION</u>: Main topics: Communication in management; Communication process; Management decisions; Style of management; Conflict management; Basic functions of management in industrial enterprises: planning, organisation, motivation and control.

**<u>PREREQUISITES</u>**: Basic knowledge of Economics, Human resources management, Fundamentals of management and Humanities.

**<u>TEACHING METHODS</u>**: Lectures and seminars supported by audio, video and multimedia equipment. Active teaching methods, constantly engaging the students, are used.

**METHODS OF ASSESSMENT:** The level of achieving the goal of the course is monitored by ongoing assessment, expressed in a grade, formed by three components: two control tests with a weight of 0.35 each and evaluation of the performance during the seminars by a factor of 0.30.

### LANGUAGE OF INSTRUCTION: Bulgarian

#### **BIBLIOGRAPHY:**

- 1. Ангелов, А., Основи на управлението, "Полина комерс", София, 2009
- 2. Иванов, Ив. Основи на мениджмънта, "Макрос", Пловдив, 2003
- Савов, В., Основи на управлението, Университетско издадетелство "Стопанство", С., 1996
- 4. Христов, Ст., Бизнес мениджмънт, Университетско издателство "Стопанство", С, 1998
- 5. Армстронг, М., Преуспяващият мениджър, "Делфин-прес", Бургас, 1993
- 6. Мескон, М., Альберт М., Хедоури, Фр., Основы мениджмънта, "Дело", Москва, 1992
- 7. Донъли, Дж. Х., Гибсън Дж.Л., Иваничевич, Дж.М., Основи на мениджмънта, С. 1997
- 8. Дракър, II., Управление на организации с идеална цел: "Принципи и практика", Фондация "София", София, 1997
- 9. Griffin, R.W., Managementq Texas A&M University, 1996
- 10. Appleby K., Modern Business administration, Fifth Editionq Pitman Publishing, 1991
- 11. Дракър П. Ефективното управление, Класика и стил, С. 2002
- 12. Ташев А. и др. Мениджмънт на човешките ресурси, ТУ София, филиал Пловдив 2004
- Ташев, Гигова, Михова Ръководство за упражнения по МЧР, ТУ София, филиал Пловдив 2007

#### **COURSE CHARACTERISTICS**

Course Title: SMALL FIRM MANAGEMENT	Code: BCS45	Semester: 6
Type of Teaching:	Contact hours per	Number of
	week:	credits:
Lectures and Seminars	L-2 hours, $S-2$ hours	4

#### **LECTURER:**

Professor Kamen Loukanov, Ph.D., Tel: 032 659 715 Technical University – Sofia, Plovdiv Branch

**<u>COURSE STATUS IN THE SYLLABUS</u>**: Optional for students majoring in Computer Systems and Technologies at the Faculty of Electronics and Automation, Bachelor's Degree.

**<u>COURSE OBJECTIVES</u>**: Expanding students' theoretical knowledge and practical interpretation of basic economic categories and their manifestation; interrelations in the setting up and management of small firms.

<u>**COURSE DESCRIPTION</u>**: Nature of small businesses: problems and trends; legal issues in small businesses; interrelations with the fiscal system; planning in small firms; small business funding; marketing of small firms' products; offices and equipment; small business staffing; current funds management; commercial deals and agreements; small business termination.</u>

**PREREQUISITES:** Knowledge of basic concepts in Economics is required.

**<u>TEACHING METHOD</u>**: Lectures and seminars. A multimedia beamer are used in lectures; computers and written assignments – in seminars.

**METHODS OF TESTING AND EVALUATION**: Continuous assessment through a test and developing a business plan.

#### LANGUAGE OF INSTRUCTION: Bulgarian

#### **LITERATURE RECOMMENDED:**

- 1. Иванов, Владимир, Иванов, Румен Управление на малка фирма учебно помагало, Център по предприемачество към ТУ-София, филиал Пловдив
- 2. Иванов Владимир Ръководство за подготвяне на бизнесплан
- 3. David Stokes Small Business Management DP Publications Ltd 1995
- 4. Маринов, Г. и др. Приложна икономика ИНФОРМА ИНТЕЛЕКТ, С. 1997
- 5. Нанде, Арвин Започнете вашия бизнес, наръчник ПРООН, С., 1998
- 6. Въведение в бизнеса Джанет Кук ФЮТ, 1994
- 7. Старт в бизнеса BARCLAYS BANK PLC, Изд. Къща stn В. Търново 1992
- 8. Азбука на успешния бизнес МОТ Женева, Изд. ВШИОМ "ОКОМ", С., 1993
- Тодоров, К. Стратегическо управление в малките и средните фирми Изд. "НЕКСТ", С., 1997
- 10. Тодоров, К и др. 25 казуса за предприемачи и мениджъри от практиката,
- 11. Тодоров, К и др. 9 бизнесплана за стартиране на собствен бизнес в условията на валутен съвет, Изд. "НЕКСТ", С., 1998
- 12. Кавазаки, Гай Как да побъркате конкурентите си Princeps, С., 1998
- 13. Фентън, Джон Как се продава срещу конкуренцията АПИС, С., 1992

#### **COURSE DESCRIPTION**

Name of the course: Marketing	Code: BCS45 L103	Semester: 6
Type of teaching: Lectures Seminar exercises	Lessons per week: I = 2 SF = 2	Number of credits: 4

LECTURERS: Assoc Prof PhD Vladimir Ivanov

Sofia Technical University – Plovdiv Branch

<u>COURSE STATUS IN THE CURRICULUM</u>: The course *Marketing* is included as an optional manager course in the Bachelor's degree curriculum of the students, majoring in Computer systems and technologies.

AIMS AND OBJECTIVES OF THE COURSE: The students are expected to acquire and deepen their knowledge of the basic marketing concepts and principles.

<u>COURSE DESCRIPTION:</u> The following issues are in the scope of the course: basic marketing concepts and principles; elements of the marketing environment; market segmentation and positioning. The marketing information systems are considered in detail, along with the methods of collecting, processing, analysis and control of marketing information. The applicable methods of planning and organizing marketing research are studied.

Planning and implementation of product and innovation policy. In the section on pricing policies the basic methods for the formation of prices and basic pricing strategies are studied. Distribution policy is presented in terms of the channels of distribution and sale strategies for internal and external markets. Special attention is paid to the implementation of logistics in market structuring.

In the section on communication policy all basic methods of promotion, carried out by means of conventional advertising forms, as well as by electronic means (Internet etc.) are studied.

**TEACHING METHOD:** Lectures with presentations, discussions with active participation of students after preparation; seminar exercises – with course assignments, comprising description and defense.

METHODS OF ASSESSMENT: Ongoing assessment. LANGUAGE OF INSTRUCTION: Bulgarian BIBLIOGRAPHY:

1. Котлър, Ф. Маркетинг, С., 1999

2. Котлър, Ф. Маркетингови съвети от А до Я, С., 2006

3. Кузманов, Г. Маркетинг, П-в, 2006

4. Кузманов, Г.Фирмата към промяна и подобрение, П-в, 2003

5. Кузманов, Г.България в ЕС: нови маркетингови реалности и задачи пред

управлението на бизнеса, П-в, 2007

- 6. Благоев, В. Маркетинг, С., 2003
- 7. Бърд Дрейтън, Директен маркетинг, Б.1993
- 8. Волф Ябок, Маркетинг, С., 1995
- 9. Джефкинс, Ф.Въведение в маркетинга, рекл. и пр., С. 1993
- 10. Доганов, Д. и кол., Маркетинг, тестове и задачи, рсчник, С.2007
- 11. Доганов, Д., Рскламата каквато е, В., 1992
- 12. Желев, С. Маркетингови изследвания, С. 1995

#### **COURSE CHARACTERISTICS**

Course Title:	Code: BCS 45	Semester: 6
Management		
Type of Teaching:	Contact Hours per week:	Number of
Lectures, Seminars	L - 2 hours, $S - 2$ hours	credits: 4

#### **LECTURERS:**

Prof. Ivan Ivanov, P.h.D. – guest lecturer, tel.:+359 32 261 365, Plovdiv University Assist. Prof. Georgi Georgiev (FME), tel.:+359 32 659 702, email: <u>georgi@tu-plovdiv.bg</u> Technical University – Sofia, Plovdiv **B**ranch

**<u>COURSE STATUS IN THE SYLLABUS</u>**: Optional for students majoring in Computer Systems and Technologies at the Faculty of Electronics and Automation, Bachelor's Degree. **<u>COURSE OBJECTIVES</u>**: Students acquire basic knowledge of the management process in

the organization and the manager's roles and responsibilities.

**COURSE DESCRIPTION:** Basic topics: Organizations and their internal and external environment – nature and characteristics of the organizations, internal environment of the organization, external environment of the organization; Evolution in the theory and practice of Management – basic schools; The Management process and the work of the manager – basic managerial functions, skills, dilemmas and roles, generalised model of the manager's activity; Managerial decisions – decision-making process, stages of the decision-making process, decision-making methods; Planning – generalised model of the planning process: Organising – nature and contents of the 'organising' function; organizational structures – basic types and characteristics; Motivation –general model of the motivation process: Leadership – basic models of leading, theories and approaches to leading, group leading, types of groups in the organization, group characteristics, conflict management; The Control function – nature, types of control and control requirements, methods of control.

**PREREQUISITES:** Completed course in Economics.

**TEACHING METHOD:** Lectures, slides, case studies and model tests.

**TESTING AND EVALUATION METHODS:** Two one-hour written tests – one mid-term (40%) and one at the end of the semester (40%), and participation in seminars (20%).

#### LANGUAGE OF INSTRUCTION: Bulgarian

#### LITERATURE RECOMMENDED:

- 1. Ганчев, П Основи на мениджмънта. София, 2005 г.
- 2. Донъли, Дж. и др., Основи на мениджмънта превод от английски, Отворено общество, с. 1998г.
- 3. Иванов, И. и Г. Георгиев, Основи на мениджмънта, Университетска фондация, Пловдив, 1995г.
- 4. Иванов, И. П. Ганчев, Г. Георгиев, В. Пенчев, П. Пенчев и И. Пенчева, Основи на мениджмънта, Абагар, Велико Търново, 1999 г.
- 5. Иванов, И., Основи на мениджмънта, Макрос 2000, Пловдив, 2003 г.
- 6. A. G. Bedeian, "Management", Louisiana State University, 1993.
- 7. G. A. Cole, "Management, Theory and practice", D.P. Publication, LTD, London, 1993.
- 8. S. P. Robbinson, "Management", Prentice Hall International, Inc, 1994.