course description

Fly to Italy

این فایل به منظور کمک به متقاضیان تحصیل در کشور ایتالیا توسط گروه فلای تو ایتالی به صورت رایگان تهیه شده است لطفا از خرید این فایل خودداری فرمایید.

اسفاده از این فایل در صفحات مجازی و وبسایت ها **با ذکر نام تهییه کننده** بلا مانع است.

معرفی فلای تو ایتالی

سلام ...!
تیم فلای تو ایتالی متشکل از چند دانشجو که فعالیت خودمون را از ماه بهمن سال **1401** آغاز کردیم و هدف تیم ما این است که به شما کمک کنیم تا بتوانید به صورت مستقل و بدون نیاز به مشاوران مهاجرتی برای دانشگاه های ایتالیا اپلای کنید و پذیرش بگیرید . با توجه به اینکه بسیاری از موسسه های مهاجرتی هزینه های بالایی را برای اخذ پذیرش از دانشگاه های ایتالیا از دانشجو دریافت میکنند ، ما تصمیم گرفتیم با تلاش و تجربه خود به دانشجو ها کمک کنیم که بدون هزینه اضافه کار های مهاجرتی خودشون را انجام بدهند .
در این راستا در طی سال های گذشته ویدئو های مختلفی را برای نحوه اپلای کردن دانشگاه های ایتالیا ضبط و منتشر کردیم تا به دانشجویان کمکی کرده باشیم تا بتوانند در این مسیر با کمترین هزینه از دانشگاه های ایتالیا پذیرش بگیرند .

پس اگر سوال یا نیاز به راهنمایی در زمینه مهاجرت تحصیلی به کشور ایتالیا داشتید ، با ما همراه باشید و سوالات خودتون را از ما بپرسید . ما در کنار شما خواهیم بود و شما را همراهی خواهیم کرد .

مدیریت **fly to italy**

طریق استفاده از فایل

برای استفاده از این فایل ، صفحات بعد را کپی گرفته و به دانشگاه مبدا ببرید و تاییدات لازم را بگیرید

Title of the Course: Mathematics I
Number of Credits: 3 (51 hours)
Type of the Course: Theoretical
Pre-requisite: None

Syllabus of Courses:

Cartesian coordinates; polar coordinates; complex numbers; addition, product, root & geometrical representation of complex numbers; polar representation of complex numbers; function; functions algebra; limit and relevant theorems; infinite limit and limit in infinite; left-hand and right-hand limit; connectivity; derivative; derivation formula; inverse function and its derivative; trigonometric functions derivative and their inverse functions; Role's theorem; mean theorem; Taylor expansion; geometrical and physical applications of derivative; curves and acceleration in polar coordinates; application of derivative in approximation of equations roots; definition of integral of continuous functions and piecewise continuous; basic theorems of differential & integral arithmetic; primitive function; approximate methods of integral estimate; application of integral in computation of area, volume, length of curve, moment, center of gravity and labor ….(in Cartesian and polar coordinates); logarithm and exponential function and their derivative; hyperbolic functions; integration methods such as change of variable, component and decomposition of fractions; transform of special variables of sequence and numerical series and relevant theorems; power series and Taylor theorem with remainder.

*Pay attention to N.B. inserted after description of Mathematics II.

Title of the Course: Mathematics II
Number of Credits: 3 (51 hours)
Type of the Course: Theoretical

Pre-requisite: Mathematics I

Syllabus of Courses:

Parametric equations; space coordinates; vector and space; numerical product; matrix 3x3 of three-indeterminate linear equations system; operation on lines; matrix reverse; solving equations system; linear independence; base in R^2; R^3 linear transform and its matrix; determinate 3x3 and characteristic value and vector; vector product; second order line and plane equations; two vector functions and its derivative; speed and acceleration; bending; normal vector to a curve; multivariable function; directional and partial derivative; tangent plane and normal line to a curve; multivariable function; directional and partial derivative; tangent plane and projecting line of gradient; chain of rule for partial derivative; exact differential; second kind and third kind integrals and their application in geometrical and physical problems; transform of integration arrangement (without accurate affirmation); cylindrical and spherical coordinates; vector field; curvilinear integral; surface integral; divergence; curl; Laplacian; potential of green space and divergence and stochastic.

N.B.: arrangement of content of the courses of Mathematics I & II is on proposal basis and the universities are free to change the arrangement, regarding book, which they select.

Title of the Course: Differential Equations
Number of Credits: 3 (51 hours)
Type of the Course: Theoretical
Pre-requisite: Simultaneous with Mathematics II

Syllabus of Courses:

Nature of differential equations and their solution, family of graphs and vertical routes, physical patterns, separable equation, first order linear differential equation, homogeneous equation, 2^{nd} order linear equation, homogenous equation with fixed constants, method of indefinite constants, method of changing parameters, application of 2^{nd} order equations in physics and mechanics, solution of differential equation with series, Bessel and Gamma functions, Legendre polynomial, an introduction to differential equations set, Laplace transform and its application in solving differential equations

Title of the Course: Engineering Probabilities and Statics
Number of Credits: 3 (51 hours)
Type of the Course: Theoretical
Pre-requisite: Mathematics I

Syllabus of Courses:
An introduction to theory of sets, samples and their table display together with average, exponent, middle and variance of conversion and composition, probabilities and the relevant theorems, random variables, intermediate and average and variance of distributions, Poison's two-phrase distributions, geometric difference, normal distribution, distribution of several random variable, random sampling and random numbers, sampling from small society, estimation of statistical parameters, assurance intervals, test 2 presumptive test of decision-making, analysis and variance, regression, correlation, nonparametric methods test, fitting straight line on data.

Title of the Course: Physics I
Number of Credits: 3 (51 hours)
Type of the Course: Theoretical
Pre -requisite: None
Simultaneous: General Mathematics I

Syllabus of Courses:
Measurement; vectors; momentum in one dimension; momentum on one plane; particle dynamics; labor; energy conservation; particles systems dynamics; rotational kinematics; rigid bodies balance; temperature and heat oscillations; first law of thermodynamics; kinetic theory of gases and second law of thermodynamics.

Title of the Course: Physics II
Number of Credits: 3 (51 hours)
Type of the Course: Theoretical
Pre -requisite: Physics I Simultaneous:
Mathematics II

Syllabus of courses:
Load and material, Electric field, Gauss's Law, Electrical potential, Capacitors, Power Current and electric resistance, Electrical motor force, Magnetic Field, Ampere's Law, Faraday's Law and Induction, Electromagnetism, Alternative currents.

Title of the Course: Physics I Lab.
Number of Credits: 1 (34 hours)
Type of the Course: Practical
Pre-requisite: Physics I

Syllabus of courses:
Testing Physics I subject practically

Tit le of the Course: Physics II Lab.
Number of Credits: 1 (34 hours)
Type of the Course: Practical
Pre-requisite: Physics II

Syllabus of courses:
Testing Physics II subjects practically

Title of the Course: General Workshop
Number of Credits: 1 (51 hours)
Type of the Course: Practical
Pre-requisite: None

Syllabus of courses:

An introduction to principles of safety and health of workshops and modality of application of tools and instruments in these workshops. In this course, the student shall learn method of work with workshop tools and equipment in Machine Tools, Welding, Modeling, Casting, electricity, etc.

Title of the Course: Computer Lab .
Number of Credits: 1 (34 hours)
Type of the Course: Practical
Pre -requisite: None
Simultaneous: Fundamentals of Computer & Programming

Syllabus of Courses:

Familiarity with accessory systems such as card reader, printers, magnetic tape, disc and console, manner of work with terminal, familiarity with compilers and editors, familiarity with JCL language, familiarity with computer organization of a center, familiarity with prepared software packages such as database, spreadsheet, lotus, familiarity with the important programs of system such as sort, merge, creation and copy of files etc., familiarity with usage manner of an operating system of microcomputer

Title of the Course: Fundamentals of Computer and Programming
Number of Credits: 4 (68 hours)
Type of the Course: Theoretical
Pre-requisite: Non

Syllabus of Courses:

Introducing organization and main parts of computer, machine language and assembly, numeric and non-numeric data representation, algorithms and sub-algorithms and flowchart, basic concepts such as frequency, selection, repetition and branching, familiarity with a structured language and programming including: constants and variables, computational and logical phrases, different types of instructions, different types of conditional operations loops, vectors and matrices, subprograms, input and output instructions, common algorithms such as methods of search and arrangement, practical examples of programming.

References:

1. T. C. Bartee, Digital Computer Fundamental, McGraw Hall, 1981.
2. A. Catlin, Pascal for Engineers and Scientists with Turbo Pascal, Prentice Hall, 1990.
3. R. Bornat, Programming From First Principles, Prentice Hall, 1986.
4. A. Behfrooz and Onkar P. Sharma, An Introduction to Computer Science: A Structured Problem Solving Approach, 1985.

Title of the Course: Advanced Programming
Number of Credits: 3 (51 hours)
Type of the Course: Theoretical
Pre-requisite: Fundamentals of Computer and Programming

Syllabus of Courses:

Correct programming, programs documentation, structured programming, modular programming, familiarity with C programming language and its comparison with the first language, troubleshooting and programs testing, assurance of programs accuracy, non-numeric algorithms including: fields processing and etc., return programming, program efficiency, elementary familiarity with compilers and other translator programs, effective use of system software facilities, implementation of large programming projects in group.

References:

1. Deital and Deitel, "C++: How to Program", Prentice Hall, 1994.
2. R. S. Wiener, L. J. Pinson, An Introduction to Object-Oriented Programming and C++, Addison-Wesley, 1988.
3. B. Stroustrup, The C++ Programming Language, 2nd ed., Addison-Wesley, 1988.
4. W. R. Steens, UNIX Network Programming, Prentice Hall, 1990.

Title of the Course: Discrete Structures
Number of Credits: 3 (51 hours)
Type of the Course: Theoretical
Pre-requisite: Fundamentals of Computer and Programming & Mathematics I

Syllabus of Courses:

- Introduction: mathematical logic, algebra of expressions, well-structured formula, a review of theory of sets, proving methods.
- Relations and functions: dual relations, compatibility and equivalence relations, relations representation matrix, relations graph, functions, subjective functions,

  one to one functions.
- Graph theory: directed graphs, undirected graphs, Aurelian path and

  Hamiltonian path, optimal paths, algorithm finding of optimal paths, connected graphs, matrix of relation and related theorems.
- Trees: minimal subjective trees, mensuration of tree, application of trees, algebraic expressions and representation of their trees, application of graphs in activities analysis and projects control, Combinational analysis: pigeon hole principle, an introduction to combinational algorithms, recursive functions and their application.
- Algebraic structures: semi-groups and monoids, grammars and languages, Polish marking, groups, homomorphism, isomorphism, lattices, Boolean Algebra, grammar as an example of monoids, machines with finite states, their algebraic and graphic representation, Turing machine, markov's algorithm, an introduction to theory of computability.
- Writing and implementing some programs for this course is a must.

References:

1. R. Johnson Baugh. Discrete Mathematics, Macmillan Pub. Company, 1997.
2. W. K. Grassman and J. P. Tremblay, Logic and Discrete Mathematics: A Computer Science Perspective, Prentice Hall, 1996.
3. J. P. Tremblay, Discrete Mathematical Structures with Applications to Computer Science, McGraw-Hall, 1988.
4. Keneth. A, Rossen and Charles R. B., Wright, Discrete Matemathics, Third Edition, Prentice Hall, 1992.
5. Ralph P. Grimaldi, Discrete and Combinational Mathematics: An Applied Introduction, 1989.
6. Michael O. Alberison, Joan P. Hvtchinson, Discrete Mathematics with Algorithms, John Wiley, 1988.

Title of the Course: Machine Language and System Programming
Number of Credits: 3 (51 hours)
Type of the Course: Theoretical Pre-requisite:
Advanced Programming

Syllabus of Courses:

Familiarity with different units of computer, constants, different types of instructions, data representation, extraction and implementation of commands and their scheduling, representation of instructions in assembler language, program counter, index constants, indirect addressing, absolute and relative addressing, macroinstruction and modality of their implementation, input and output operations, interrupt and its control, subprocedures and co-procedures, reverse and reentry routines, general specifications of assemblers and openers, error display messages, programs tracking, (programming practices for this course should be selected so that their implementation in common high level languages are impossible or are relatively more difficult than assembly language) Language used for this course is IBM 370 assembly language

References:

1. P. Abel IBM PC Assembly Language and Programming, 4th edition, Prentice-Hall, 1997.
2. R. C. Detmer, Fundamentals of Assembly Programming: Using The IBM-PC and Compatibles, D. C. Health & co, 1990.
3. M. Tischer, B. Jenrich, S1 PC IN-Term, 6th edition, Abacus, 1996.
4. B. Kauler, Windows Assembly Language & Systems Programming, 16 and 32 bit LOW Level Programming for the PC and Windows, Miller Freeman Books, 1997.
5. M. Tischer, Turbo Pascal 6.0 System Programming, Abacus, 1991.
6. J. F. Brown, Ebeded Systems Programming in C and Assembly, 1998.
7. A. S. Tanenbum, Structured Computer Organization, 3rd edition, Prentice-Hall, 1990.

Title of the Course: Data Structure
Number of Credits: 3 (51 hours)
Type of the Course: Theoretical
Pre-requisite: Advanced Programming & Discrete Structures

Syllabus of Courses:

Arrays, vectors, matrices and their application like MAZE, arrays display, stacks, queues and rows, bond lists: graphic, cyclical, double bond, multi-bond, method of display and application of bond lists, trees and their mensuration, method of representation and application of trees: decision making trees, search trees, tree of the game, etc. Graphs and their representation, dynamic memory allocation and the relevant issues, searching and sorting and combining algorithms

References:

1. E Horowitz and S. Sahni, Fundamentals of Data Structures and Computer Algorithms, Computer Science Press, 1995.
2. A. M. Tenenbawn, Data Structures Using Pascal, Prentice Hall, 1986.
3. N. Wirth, Algorithms + Data Structures = Programs, Prentice Hall, 1988.

Title of the Course: Electrical Circuits I
Number of Credits: 3 (51 hours)
Type of the Course: Theoretical
Pre -requisite: Physics I
Simultaneous: Differential Equations

Syllabus of Courses:

Lumped circuits and Kirchhoff's Laws, introducing circuit parts and their relation, simple circuits (making series and parallel the resistances, capacitors, predecessors and equal resources of grid tones), RC, RL and RLC circuits (impulse response, stair response, zero input response, zero and perfect state),

Analysis of steady sinusoidal state, three-phase circuits and power in three-phase systems, coupled elements and controlled resources.

References:

1. Charles A. Desoer and Emest S. Kuh, Basic Circuits Theory, McGraw-Hill, 1970.
2. L. O. Chua, C. A. Desoer and E. S. Kuh, Linear and Nonlinear Circuits, McGrawHill, 1987.
3. James W. Nilson, Electric Circuit (4^{th} edition), Addison Wesley, 1995.
4. Lawrence P. Huelsman, Basic Circuit Theory (3^{rd} edition), Prentice-Hall, 1991.
5. G.Base and N.Stevens, Introductory Network Theory, McGraw-Hill.

Title of the Course: Electrical Circuits I Lab.
Number of Credits: 1 (34 hours)
Type of the Course: Practical
Pre-requisite: Electric Circuits I & Physics Lab II

Syllabus of Courses:
Laboratory should be presented according to the course of Electric Circuits I

Title of the Course: Logic Circuits
Number of Credits: 3 (51 hours)
Type of the Course: Theoretical
Pre-requisite: Discrete Construction
Simultaneous: Electric Circuits I

Syllabus of Courses:
Number representation system and coding, Boolean algebra and the relevant laws, different types of logic gates, logical functions and their simplification including Carnot's diagram methods and tabulation method, methods for simplifying multi-output combinational functions, design of combinational circuits including comparators, encoder, code transformers, adder, sub tractors, selectors and date distributors, design of special combinational circuits by use of PLA, ROM, MUX and PLA, ordinal circuits including flip flaps, counters, shift registers, familiarity with synchronous and asynchronous ordinal circuits, method of design and analysis of synchronous ordinal circuits, familiarity with logical ICs technology and their selection parameters.

References:

1. Victor P. Nelson, H Troy Nagle, Bill D. Carroll and David Irwin, Digital Logic Circuit Analysis & Design, Prentice-Hall Inc., 1996.
2. John F. Wakerley, Digital Design Principles and Practices, Prentice-Hall, 1993.
3. M. Morris Mano, Computer Engineering Hardware Design, Prentice-Hall, 1992.

Software:

1. Gate Level Schematic Capture and Simulation
2. Language based Simulation Program

Title of the Course: Logical Circuits Lab.
Number of credits: 1 (34 hours)
Type of credit: Practical
Prerequisite: Logical Circuits & Electric Circuits Lab I

Syllabus of Courses:
Laboratory should be presented in appropriation with the course on “Logical Circuits”.

Title of the Course: Engineering Mathematics (Mathematics for Computer Science)
Number of credits: 3 (51 hours)
Type of credit: Theoretical
Prerequisite: Mathematics II & Differential Equations

Syllabus of Courses:
This subject offers an introduction to Discrete Mathematics oriented toward Computer Science and Engineering. The subject coverage divides roughly into thirds:

- Fundamental concepts of mathematics: definitions, proofs, sets, functions, relations.
- Discrete structures: graphs, state machines, modular arithmetic, counting.
- Discrete probability theory.
- Explain and apply the basic methods of discrete (non-continuous) mathematics in Computer Science.
- Able to use these methods in subsequent courses in the design and analysis of algorithms, computability theory, software engineering, and computer systems.

Title of the Course: Algorithms Design
Number of credits: 3 (51 hours)
Type of credit: Theoretical
Prerequisite: Data Structure Algorithms

Syllabus of Courses:

Introduction to the design and analysis of computer algorithms. Topics will include concepts of algorithm complexity and analysis, and various algorithmic design patterns like divide and conquer, dynamic programming and greedy algorithms. Course will also cover major algorithms and data structures for searching and sorting, graphs, and some optimization techniques. The course introduces the basics of computational complexity analysis and various algorithm design paradigms. The goal is to provide students with solid foundations to deal with a wide variety of computational problems, and to provide a thorough knowledge of the most common algorithms and data structures.

References:

1. R. E. Neapolitan and K. Naimipour, Foundations of Algorithms Using C++ Psuedo Code, Second sedition, Jones and Barlett publishers, 1998.
2. Corman, Leisersen and Rivert, Introduction to Algorithms. MIT Press, 1990.
3. E. Horowitz and S. Sahni, Fundamentals of Computer Algorithms, Computer Science Press, 1987.
4. Aho. Hopetoft, Ullman, Data Structures & Algorithms, Addison-Wesley, 1985.
5. Udi Manber, Introduction to Algorithms: A Creative Approach, Addison-Wesley, 1987.
6. G. Brassard and P. Bratley, Fundamentals of Algorithms, Prentice-Hall, 1996.

Title of the Course: Computer Architecture
Number of Credits: 3 (51 hours)
Type of the Course: Theoretical
Pre-requisite: Machine Language and Assembly & Logical Circuits

Syllabus of Courses:

This course introduces the concepts of computer architecture by going through multiple levels of abstraction, and the numbering systems and their basic computations. It focuses on the instruction-set architecture of the MIPS machine, including MIPS assembly programming, translation between MIPS and C, and between MIPS and machine code. General topics include performance calculation, processor data path, pipelining, and memory hierarchy.

References:

1. Patterson D. A. Hennessey J. L., "Computer Architecture, Hardware/ Software Design", Morgan Kaufmann, 2nd edition, 1997.

Title of the Course: Computer Architecture Lab.
Number of Credits: 1 (34 hours)
Type of the Course: Practical
Pre-requisite: Computer Architecture & Logical Circuits Lab

Syllabus of Courses:
Laboratory will be presented according to the course of Computer Architecture.

Title of the Course: Formal Languages and Automata Theory
Number of Credits: 3 (51 hours)
Type of the Course: Theoretical
Pre-requisite: Data Structure

Syllabus of Courses:
Finite automata, Pushdown automata, touring machine, different types of grammars and languages, Chomsky classification, relation between languages and machines and the relevant theorems.

References:

1. P. Linz, Introduction to Formal Languages and Automata, Second Edition, D. C. Heath Company, 1996.
2. D. Wood, Theory of Computation, Prentice-Hall, 1986.
3. P. Reveseze, Theory of Formal Languages, Mc. Graw-Hill, 1985.
4. D. I. A. Cohen, Introduction to Computer Theory, John Wiley & Sons, Inc., 1991.

Title of the Course: Operating Systems
Number of Credits: 3 (51 hours)
Type of the Course: Theoretical Pre-requisite:
Computer Architecture

Syllabus of Courses:
Definition, existence philosophy, basic functions, different types of operating systems, operating systems hierarchy, operating system in view of user, Program Status Word (PSW), concept of interrupts, different types of interrupts and their processing, interrupts priority and next coming, I/O programming and the relevant facilities, concurrency in I/O, memory management, introducing multiprogramming environments, static memory allocation, dynamic memory allocation,

commutative memory allocation, paging according to demand, partitioning, paging part, memory hierarchy.
Processor management, works scheduling, scheduling policies, processes scheduling, processes scheduling policies, multiprocessor systems, weak communication, stable communication, allocation of sources to processes, competition mode, blocked mode and methods of releasing, mutual exclusion, processes concurrency by use of semaphore and problems resulting from which.
Systems management, basic functions, exclusive, common and dummy instruments, I/O instruments and subsidiary memories, conversion of exclusive instruments to dummy instruments, extra linear processing, direct communication, auxiliary processor of spooling system.

References:

1. A. S. Tanenbaum, Modern Operating Systems, Prentice-Hall, 1992.
2. W. Stallings, Operating Systems, 3rd edition, Prentice-Hall, 1998.
3. H. M Deitel, Operating Systems, Addison Wesley, 1993.
4. A. Silberscatz and J. L. Peterson, Operating Systems Concepts, Addison Wesley, 1998.

Title of the Course: Operating Systems Lab.
Number of credits: 1 (34 hours)
Type of credit: Practical Prerequisite:
Operating Systems

Syllabus of Courses:
In appropriation with subjects of the relevant course.

Title of the Course: Design and Implementation of Programming Languages
Number of Credits: 3 (51 hours)
Type of the Course: Theoretical
Pre-requisite: Machine Language and Assembly & Data Structure and Algorithms

Syllabus of Courses:

- Generalities of programming languages;
- Programming languages processors and method of their producing including use of compilers and interpreters;
- Data control, data determination and implementation in high level programming languages;
- Controlling mechanisms of order, repetition and selection in programming languages and their implementation;

- Data abstraction;
- Special points concerning languages with special application.

References:

1. T. W. Pratt, Programming Languages and Implementation, 3rd edition, Prentice-Hall, 1996.
2. E. Horowitz, Fundamentals of Programming Languages, Computer Science Press.

Title of the Course: Microprocessor I
Number of Credits: 3 (51 hours)
Type of the Course: Theoretical Pre-requisite:
Computer Architecture

Syllabus of Courses:

- A review of organizing one specific computer (macro-computer, minicomputer, microcomputer), process of designing microcomputer hardware;
- Central processing unit of microprocessor, its organizing, external interface, instruction frame, addressing aspects, instructions sets, scheduling, instruction and machine cycles, physical and electric properties;
- 8-bit series microprocessors (Intel) including Z80-8085-8080, assembly language programming, preparation of machine code, computation of implementation time, method of connection of microprocessor to the accessory systems in a minimum system;
- 8-bit series microprocessors (8086), features of 16 bit microprocessors, program writing, preparation of machine code, computation of implementation time, 8251 USART port, 8255 parallel port, Interrupt controlling;

References:

1. J. F. Uffenbeck, Microcomputers and the 8080, 8085 and Z80 Programming, Interfacing and Troubleshooting, Prentice-Hall, 2nd edition, 1991.
2. W. A. Triebel and A. Singh, The 8088 and 8086 Microprocessors, Prentice-Hall, 1997.
3. H. K. J. Breeding, Microprocessor System Design Fundamentals, Prentice-Hall, 1995.

4. K. L. Short, Microprocessor and Programmed Logic, Prentice-Hall, 1987.

Title of the Course: Microprocessor I Lab.
Number of Credits: 1 (34 hours)
Type of the Course: Practical
Pre-requisite: Computer Architecture Lab & Microprocessor I

Syllabus of Courses:
To be performed in proportionate to the course on "Microprocessor I", so that either hardware or software aspects of the course could be protected.

Title of the Course: Electronic Circuits
Number of Credits: 3 (51 hours)
Type of the Course: Theoretical
Pre-requisite: Electric Circuits I

Syllabus of Courses:

- Semiconductors of type of N & P: current and voltage equations in diode; equivalent circuit of diode.
- Diode circuits: half-wave and full wave rectifiers models; clip circuits; clamp circuits
- Study of transistor: Biasing and fixing work point in different connections; equivalent circuit of transistor (in low frequencies and small signals) and application of transistor as amplifier of a level (refer to work of transistor as switch)
- Study of JFET in different connections; biasing; equivalent circuit and application

of FET as amplifier (refer to application as switch) Transistor MOS: (E,
D) refer to N-MOS, P-MOS & C-MOS

- Transistor UJT and refer to its application (for production of Ramp wave)□ □ Four-layer diodes

Title of the Course: Electronic Circuits Lab.
Number of credits: 1 (34 hours)
Type of credit: Practical
Prerequisite: Electric Circuit Lab I & Electronics I

Syllabus of Courses:

In appropriation with subjects of the relevant course

Title of the Course: Signals and Systems Analysis
Number of Credits: 3 (51 hours)
Type of the Course: Theoretical
Pre-requisite: Engineering Mathematics & Engineering Probabilities and Statics

Syllabus of Courses: covers the fundamentals of signal and system analysis, focusing on representations of discrete-time and continuous-time signals (singularity functions, complex exponentials and geometrics, Fourier representations, Laplace and Z transforms, sampling) and representations of linear, time-invariant systems (difference and differential equations, block diagrams, system functions, poles and zeros, convolution, impulse and step responses, frequency responses). Applications are drawn broadly from engineering and physics, including feedback and control, communications, and signal processing.

References:

1. A. V. Openteim and A. S. Willsky, Signals and Systems, Prentice-Hall, 1983.
2. C. Ziemer, W. H. Tranter, D. R. Fannin, Signals and Systems: Continupus and Discrete, Macmillan, 1990.

Title of the Course: Computer Networks
Number of Credits: 3 (51 hours)
Type of the Course: Theoretical Pre-requisite:
Computer Architecture

Syllabus of Courses:

- Structure of networks, network architectures, reference model of ISO, networks of ARPA, SNA, DECNET and general.
- Network topology, connectivity analysis, delay analysis, design of network with local access.
- Design of physical layer, fundamentals of theory for data transfer, transfer telephone systems and multiplexing, survey on terminal, transfer errors.
- Data relation layer, primary protocols for data relation, internet protocol standards, internet IP protocol, IPv6 protocol, internet ISO protocol, ISO routing protocol, sliding window protocol, protocols analysis.
- Primary layer of network, point-point networks, routing algorithms, density, Transport & Application layers.
- Secondary layer, satellite and radio networks, broadcasting satellite packages, radio packages.

References:

1. F. Halsail, Data Communications, Computer Networks and Open Systems, 4th edition, Addison Wesley, 1996.
2. A. S. Tannenbaum, Computer Networks, 3rd edition, Prentice-Hall, 1996.
3. W. Stallings, Data and Computer Communications, Prentice-Hall, 1996.

Title of the Course: Method of Presentation of Scienti fic & Technical Subjects
Number of Credits: 2 (34 hours)
Type of the Course: Theoretical
Pre-requisite: Technical English Language and after passing 80 course credits

Syllabus of Courses:

Different types of scientific and technical subjects (letters, reports, pamphlets, manual and etc.), common points in all scientific and technical writings: specifying the objective of writing and its eventual readers, organizing the subjects, abstract of essay together with report, the role of a good introduction, dividing the subjects into parts and chapters, discussion and conclusion, preparing source and reference index, attachments, preparing the pictures and diagrams and tables. Important points in translation of scientific and technical subjects, writing style, marking and its importance, preparing final format of writing by typing machine or computer, foot-article, notes and other lateral subjects, an introduction to research methods, presenting subjects orally, effective use of audio-visual devices, the rules and process of drawing up graduation diploma including the main parts of thesis and details of each part, preparing and presenting a scientific essay (as assignment)

References:

1. Rohani Rankoohi, Seyed Mohammad-Taghi, Method of Presentation of Scientific & Technical Subjects, Center of Scientific Publications, 1989.
2. Aryanpour, Research, Amirkabir Publications, 4th edition, 1982.
3. Carlton (translated by Kazem Izadi), Research Methodology, Keyhan Publications, 1988.
4. D. Beer and D. McMerrey, A Guide to Writing as an Engineer, Wiley, 1997.
5. M. H. Markel, Writing in the Technical Field: A Step-by-step Guide for Engineering, Scientists and Technicians, IEEE Press, 1994.
6. B. E. Cain, The Basics of Technical Communication, American Chemical Society, 1988.

Title of the Course: Artificial Intelligence
Number of Credits: 3 (51 hours)
Type of the Course: Theoretical
Pre-requisite: Algorithm Design and Analysis

Syllabus of Courses:

Introducing artificial intelligence, searching space of facilities, basic methods for solving problems, introducing the games, knowledge representation by use of first order logic, knowledge representation by use of the other orders logic, structured representation of knowledge, advanced systems for solving problems, understanding natural language, the issue of understanding and learning, implementation of artificial intelligence systems including: languages and machines, study of practical application of artificial intelligence in the fields of medicine, science, architecture and industries, new research results, existing problems and an outlook to the future. In this course one of the languages for understanding artificial intelligence such as LIPS and/or PROLOG should be used.

Reference s:

1. Russel and Norwig, "Artificial Intelligence: A Modern Approach", Prentice-Hall, 1995.
2. E. Rich. "Artificial Intelligence", McGraw-Hill, 2nd edition, 1992.
3. I. Bratko, "Prolog Programming for AI", Addison Wesley, 1986.
4. N. J. Nilsson, Principles of Artificial Intelligence, Springer-Verlag, 1980.
5. L. Sterling and E. Shapiro, Art of prolog, MIT Press, 1986.

Title of the Course: Principles of Compilers Design

Number of Credits: 3 (51 hours)

Type of the Course: Theoretical

Pre-requisite: Theory of Machines and Languages & Design and Implementation of Programming Languages

Syllabus of Courses:

- Preparations (types of translators including compilers and interpreters), structure and components of compilers (word, syntactic, semantic analyzers, symbols table management, intermediate and final code generation, optimization, errors management)
- Languages features and grammars (Chomsky classification), vague grammars, concise and useful grammars
- Word analysis of regular expressions, word-error correction, grammars of interpretation of deterministic and non-deterministic states)
- Method of description of syntax and meaning of the word analyzer including: method of analysis of LR and LL(1) like SLR(1), LALR(1),CLR(1). Recursive Descent Implementation and Analysis Table (SP,OP). LR(1) table correction in vague grammars.
- Correction methods of syntactic errors.
- Semantic analysis (static and dynamic tests).
- Symbols table management and their structure.
- Memory allocation methods (static and dynamic).
- Methods of generating codes like Syntax Directed or Tree Walking

References:

1. Aho, Sethi and Ullman, Compilers: Principles, Techniques and Tools, Addison-Wesley, 1986.
2. Trembley and Sorenson, The Theory and Practice of Compiler Writing, McGrawHill, 1985.
3. Pittman and Peters, The Art of Compilers Design, Prentice-Hall, 1992.
4. R. Mack. Writing Compilers and Interpreters: An Applied Approach Using C++, 2nd edition, John Wiley, 1995.

Title of the Course: Physical Education
Number of Credits: 2 (34 hours each)
Type of the Course: Practical
Pre-requisite: Non

Syllabus of Courses:

- Demonstrate competency in motor skills and movement patterns needed to perform a variety of physical activities.
- Applies movement concepts and principles to the learning and development of motor skills.
- Exhibit a physically active lifestyle.
- Achieves and maintains a health-enhancing level of physical fitness.
- Demonstrate responsible personal and social behavior in physical activity settings.
- Exhibits responsible personal and social behavior that respects self and others in physical activity settings.
- Values physical activity for health, enjoyment, challenge, self-expression, and social interaction.
- Select one field of sport and receiving skills of it.

Title of the Course: Computer Graphics I
Number of Credits: 3 (51 hours)
Type of the Course: Theoretical
Pre-requisite: Group's Approval

Syllabus of Courses:

- The goal of this course is to provide an introduction to the theory and practice of computer graphics. Topics covered will include:
- Introduction, Motivation, Uses, History
- Graphics Systems and Models
- Graphics Programming: Getting started with OpenGL
- Input and Interaction in OpenGL

- Geometrical Objects and Transformations in 2D and 3D: Objects Representation, Coordinates transformation, windows and viewports
- Viewing in 3D: Orthogonal and projective views, hidden surface removal Light, Shading and Materials: Illumination and shadows, light sources, surfaces and possibly one or more from the following in less detail:
- From Vertices to Fragments: Graphics pipeline, rasterization, color system
- Texture Mapping
- Modeling Techniques: Graphics data structure, curve and surface representations, modeling methods
- Advanced Rendering Techniques: Ray tracing, radiosity, image based rendering
- Programmable shaders: Shading language, vertex and fragment shaders
- Scientific Visualization: CT/MRI datasets, color composting, transfer functions

Reference:

1. D. Hearn and M. P. Baker, Computer Graphics, Prentice-Hall, 1994.

Title of the Course: Data Storage and Retrieval

Number of Credits: 3 (51 hours)

Type of the Course: Theoretical

Pre-requisite: Discrete Construction

Syllabus of Courses:

- Different levels of data storage and retrieval (program level, operating system level, media level)
- Memories (magnetic tape, CD, CD-ROM)
- Basic concepts of file (logical and physical views of file, combining logical and physical views of file, blocking techniques, buffers)
- Non-sequentially arranged file structure (an introduction to Pile and it's uses, the method of operation on file, time evaluations of operations)
- Sequentially arranged file structure (introduction and creation method, the method of operation on files, overflow area, time evaluation of operations, an example of assessment and performance, difficulties of sorting large files)
- External sorting (difficulties of regular sorting and an introduction to external sorting, introducing the method and providing terms of sorting, time evaluation of each level, sorting by two disc drivers)
- Indexed sequential file structure (introducing index, structure and operation method, time evaluation, example of assessment and performance)
- B-tree file structure (introducing B-tree as a primary index and a secondary index, operation method on B-tree, time evaluation, example of assessment and performance, calculating memory usage in primary and secondary levels, comparing B-tree with previous structures)
- Random file structure (introduction, hashing techniques with independent buckets, method of operation, time evaluation, comparing Random files with Btree files, linear hashing and operating method, extensible hashing, extensible hashing with limited index)

References:

1. Salzberg, File Structures: An Analytical Approach, Prentice-Hall, 1988.
2. G. Wiederhold, File Organization, Mc-Graw Hill, 1988.

Title of the Course: Software Engineering I
Number of Credits: 3 (51 hours)
Type of the Course: Theoretical
Pre-requisite: Data Storage and Retrieval

Syllabus of Courses:

Software crisis, reasons of needing the etiology of methodology and primary process, system life cycle (including requirements analysis, general design, partial design, implementation, system conversion and maintenance).

Systems analysis meanings, structured information systems (introducing some structured methods like Demarco, Yourdon, Gane & Sarson). Physical and logical models of available data-current and suggested data-current, exact specifications of activities and data culture, designing files with informational banks, input forms and software structure design, determining process specifications with system operations.

An introduction to methods of collecting information, estimating expenses, estimating time needed for each level, project management methods and tools, system analysis tools, system design tools, first part of CASE. In this course students must do a group project.

References:

1. Bentley, Barlow and Toppan, Systems Analysis and Design Methods, 1990.
2. Yourdon, Modern Structured Analysis, Prentice-Hall, 1989.
3. J. Fitsgerald and A. Fitzgerald, Fundamentals of Systems Analysis, 3rd edition, John Wiley, 1987.
4. E. M.Awad, Systems Analysis and Design, 2nd edition, 1985.
5. Hawryszkiewgez, Introduction to Systems Analysis and Design, 2nd edition, Prentice-Hall, 1990.
6. K. E. Kendall and J. E. Kendall, Systems Analysis and Design, 2nd edition, PrenticeHall, 1992.
7. B. Boehin, Software Engineering Economies, Prentice-Hall, 1981.
8. A. Summerville, Software Engineering, 4th edition, Addison Wesley, 1996.
9. R. S. Pressman, Software Engineering, A Practitioner Approach, 4th edition, McGraw, 1996.

Title of the Course: Software Engineering II
Number of Credits: 3 (51 hours)
Type of the Course: Theoretical

Pre-requisite: Software Engineering I

Syllabus of Courses:

Software engineering description, roles and goals in computer systems production, procedure of making a software (from determining specifications to implementation), procedure of software creation, system life cycle models, software designing methods (performance-oriented, procedure-oriented, data-oriented, object-oriented), software implementation strategies (observations of implementation, programming language in software production), documentation techniques, examination and verification and diagnosing software credit, software correctness and reliability, bug fixing and defense against any bugs, improve efficiency, software design so that software can be reused, introduction to backup tools, reusing software, software maintenance and development, introduction to second part of CASE.

In this course students must do a group project.

References:

1. A. Sommerville, Software Engineering, 4th edition, Addison-Wesley, 1996.
2. R. S. Pressman, Software Engineering: A Practitioner Approach, 4th edition, McGraw-Hill, 1992.
3. D. Bell, I. Morry and J. Pavgh. Software Engineering, A Practical Approach, Prentice-Hall, 1992.
4. I. Jacobson, Object-Oriented Software Engineering, John Wiley, 1993.

Title of the Course: Principles of Database Design

Number of Credits: 3 (51 hours)

Type of the Course: Theoretical

Pre-requisite: Data Storage and Retrieval

Syllabus of Courses:

- A review of Data Storage and Retrieval
- Concepts and definitions of database management (definition of data and information, database definition and necessity, data independence, various models of database systems)
- Architecture of a database system (three-level architecture, external level, internal level, conceptual level, database and data manager, data communication manager)
- Various models of database systems (Hierarchical model, Relational model, network model)
- Relational model and its principles (domain, relation and its variety)
- Relational model collectivity (candidate key, primary key and component key, foreign key and its production, Null foreign key and primary key)
- Relational calculus
- SQL language
- Functional dependencies (partial dependencies definitions, a collection of dependencies, irreducible collection of dependencies)

- Normalization (INF, 2NF, BCNF, MVD, 4NF, JD, SNF)
- More advanced contents (protection, reparation, simultaneity, object-oriented databases)

References:

1. C. J. Date, Introduction to Database Systems, Sixth Edition, Addison-Wesley, 1995.
2. Elmasri, Fundamental of Database Systems Systems, 2nd edition, Addison-Wesley, 1994.
3. S. Abitebout, R. Hull and V. Vianu, Foundaions of Databases, Addison-Wesley, 1995.
4. H. Korth and A. Silberchatz, Database System Concepts, 3rd edition, McGraw-Hill, 1997.

Title of the Course: Database Lab.
Number of credits: 1 (34 hours)
Type of credit: Practical
Prerequisite: Principles of Database Design

Syllabus of Courses:
In appropriation with subjects of the relevant course.

Title of the Course: English Language
Number of Credits: 3 (51 hours)
Type of the Course: Theoretical
Pre-requisite: Non

Syllabus of Courses:
Aim of Course: The aim of this course is teaching general English language to the students.

Title of the Course: Technical English Language
Number of Credits: 2 (34 hours)
Type of the Course: Theoretical
Pre-requisite: English (Foreign Language)

Syllabus of Courses:
Aim of Course: The aim of this course is to teach students how to read the technical texts in their text books which written in English more efficiently.

References:

1. Keith Boeckner, P. Charlers Brown, Computing, Oxford, 2001
2. An English for Academic Purposes Programmer, Mac Millan (China) Ltd.

Title of the Course: Internship
Number of Credits: 2 (2 months)
Type of the Course: Practical
Pre-requisite: Passing 100 credits

Syllabus of Courses:
Aim of Course: Students have to work in a company or manufacture in a field related to their interests or project.

Title of the Course: Project
Number of Credits: 3 (51 hours)
Type of the Course: Practical
Pre-requisite: Method of Presentation of Scientific and Technical Subjects & Computer Architecture.

Syllabus of Courses:
Aim of Course: Developing a system using all or part of the materials that was gained through bachelor program based on personal interests.

Title of the Course: Method of Analysis
Number of Credits: 3 (51 hours)
Type of the Course: Theoretical
Pre-requisite: Mathematics II

Syllabus of Courses:

Building upon calculus and computer programming, the course covers basic numerical methods, including linear and nonlinear algebraic equations, interpolation and approximation, ordinary differential equations, numerical integration and differentiation, finite element and perturbation. Weekly assignments involve both pencil-and-paper and computer work.

Title of the Course: Multimedia Environment
Number of Credits: 3 (51 hours)
Type of the Course: Theoretical
Pre-requisite: None

Syllabus of Courses:

Aim of the course: The aim of this course is to teach students how to make animation using its related softwares and making 2D and 3D games using game engines such as Unity, CRYENGINE and etc.

Title of the Course: Programming (co-procedural Programming)
Number of Credits: 3 (51 hours)
Type of the Course: Theoretical
Pre-requisite: None

Syllabus of Courses:
Aim of the course: The aim of this course is to teach students basic concepts of multi-threading using Python and C++ (OpenMP library) languages and also Multi-Pascal simulation environment. In this course some problems were implemented such as tournament technique.