APPLIED ELECTRONICS
(2018 - 2019 academic year)

1st year of study – 1st semester (autumn)

Mathematical Analysis – Loredana IAMBOR

1. The real numbers: some basic concepts
2. Sequences of real numbers
3. Series of real numbers; Series with nonnegative terms (I)
4. Series with nonnegative terms (II); Alternating series
5. burca
6. Higher order derivatives; Taylor series and power series
7. The Riemann integral; Improper integrals
8. The Euclidean (topological) space ; Sequences of points in
9. Limits and continuity of real-valued functions of several variables
10. Partial derivatives and the differential
11. Local extremum points for real-valued functions of several variables
12. Double integrals. Triple and multiple integrals. Change of variables
13. Surface integral. Flux of vector field across a surface. Stokes' Theorem

Linear algebra, analytical and differential geometry – Dorina FECHETE

1. Preliminaries (sets, relations, functions, algebraic structures, matrices, determinants, systems of linear equations)
2. Vector spaces. Properties and examples
3. Basis and dimension of a vector space
4. Change of basis of a vector space
5. Subspaces
6. Linear transformations. Definitions and properties
7. Matrix of a linear transformation
8. Eigenvalues and eigenvectors; Matrix diagonalizations
9. Bilinear forms and quadratic forms
10. Inner-products, norms and metrics
11. Euclidean vectors
12. Analytic geometry
    - Equations and curves
    - Lines and planes
    - Conic sections
    - Quadric surfaces
13. Differential geometry of curves and surfaces

Physics – Sanda FILIP

1. Elementary Mechanics
    - I.Kinematics
        - Simple Motion in One, Two or Three Dimensions.
        - Inertial and Non-Inertial Reference Frames.
    - II. Dynamics
        - Newton's Laws. Conservation of Mechanical Energy.
        - Generalized Work-Mechanical Energy Theorem for Systems of Particles.
        - Center of Mass. Collisions.
    - III. Gravity
        - Kepler's Laws. Newton's Law of Gravitation.
        - The Gravitational Field. Gravitational Potential Energy.
    - IV. Oscillations
        - The Simple Harmonic Oscillator. Y motion. Applications of simple harmonic movement.
        - Damped Oscillation. Damped, driven Oscillations. Resonance.

Two Dimension Oscillations.
V. Elastic Properties of Materials - Fluids. Waves.
Static Fluids. Fluid Flow. Fluid Viscosity.
Solutions to the Wave Equation. Sound Wave in a Fluid.

2. Molecular Physics and Thermodynamics
I. Kinetic Molecular Theory of Gases (KMT).
Atomic Concept on the Structure of Molecules.
General Notions in Molecular Physics.
II. Kinetic Theory of Ideal Gases
The Ideal Gas Model.
Temperature and KMT.
Joule's law. Equation of Ideal Gas.
III. Basic concepts of thermodynamics
General notions.
The General Principle and Zeroth Low of Thermodynamics.
Temperature in Thermodynamics.
IV. First Low of thermodynamics
Thermodynamics and Energy.
Heat, Work and Calorimetry.
Heat coefficients.
Ideal Gas Thermodynamics: Specific Heats, Isotherms, Adiabats.
V. The Second Low of Thermodynamics
Heat Engines.
The Second Low for Bitermal cyclic transformations. The Carnot Cycle.
The Second Low for Nonstatic-Irreversible Processes
The Third Low of Thermodynamics

3. Optics
The Fundamental Laws of Geometric Optics
Reflection and refraction of Light Rays
Optical prism and Optical Lenses
Optical Instruments

4. Atomic and Nuclear Physics
Elementary Atomic and Nuclear Physics
Atoms and Electromagnetic Waves
Nuclear Models. Nuclear Properties.
Nuclear Decay and Radioactivity.

5. Applications of Physics in Engineering Sciences

Applied Informatics – Laviniu ȚEPELEA

1. Introductive notions. DOS operating system.
2. Windows operating system. Linux operating system.
3. Microsoft Word.
4. Microsoft Excel.
5. Microsoft Powerpoint.
6. Microsoft Visio.
7. Electronic diagrams in Microsoft Visio.
8. Electronic simulation softwares.
9. Circuit Design Suite (Multisim).
10. Proteus Desgin Suite.
11. LTSpice.
12. Using PonyProg software.
13. Using Mikroelektronika Programming Tools.
14. Using Microchip Programming Tools.

Internet services – Adrian ȘCHIOP

1. Search engines. Web portals
2. Creating a Web page using HTML language. Basic tags.
3. Text formatting.
4. Colors Inserting images and hyperlinks. Special characters in HTML.
5. Advanced HTML tags. Multimedia and objects. Webpage layout.
6. Using styles (CSS) in a web page.
7. Javascript. Events and variables treating.
8. Web form

Technical drawing – Maria DURGĂU

1. Presentation of the AutoCAD operating mode. The AutoCAD User Interface. Launching orders. Data input. Selecting objects. Display Control. Establishing the drawing environment. End of work session.
2. Use basic commands for drawing, editing, and specifying entity-specific points. Draw commands for base entities. Commands used to modify and edit drawings. Using Object Snap Modes (Object SNAP). Selection sets.
3. Using the UCS coordinate system in plane drawing (2D). Orders for making connections and bevels. Orders that allow copying, moving, scaling, and splitting entities.
4. General rules for the execution of the technical drawings Lines used in the technical drawing. Formats of technical drawings. Indicator. Numerical scales used in the technical drawing. Standardized writing. Representations used in industrial design: Representation in double and triple orthogonal point projection.
5. Orthogonal representation of the straight. Double Orthogonal Projection of the Straight. Triple Orthogonal Projection of Straight.
6. Rules for the representation and marking of views and sections. Layout of the projections in the plan. Classification of views. Section representation of parts. Classification of sections. Notation of section sectioning path.
7. Use of commands for quoting drawings. Rules and quotation rules. Elements of quote. Symbols used for enrolling quotas. Quoting specific elements. Classification of allowances. Quoting methods.
8. Quoting drawings with AutoCAD. Configuring Query Elements. Print text. Text style. Text input
9. Viewing a drawing. Hatching and representing breaks. Study some drawing display commands. Hatching. Hatch styles. Representation of ruptures.
10. Using Layers. Layer Definition. Create and modify layers. Determining the color and layer type of layers. Define blocks. Studying commands for creating and inserting blocks into AutoCAD.
11. Elements of 3D Modeling and Visualization. Introduction to 3D modeling. Types of three-dimensional models. Superficial models. Coordinate systems in 3D. Creating surfaces. Modeling solids. Generating Solids. Editing Solid Objects. Quoting in 3D
12. Presentation of the OrCAD Capture program. Present the steps required to create the electrical schemes using the OrCAD Capture program.

Passive components and circuits – Simona CASTRASE

1. Electrostatics. Electric field. Electrical potential and electrical voltage.
2. The electric flow. Gauss's Law. Applications to field and electrostatic potential calculation
3. Electrokinetic. Electric current. Electromotor voltage. Electric conduction. Law electrical conduction
4. Ohm Law. Joule-Lenz Law. Electricity Conservation Law. Kirkhoff's theorems.
5. Electromagnetism. The magnetic field. Magnetic induction. Magnetic Field Intensity. Forces exerted by the magnetic field Passed by electric currents.
6. Passive circuit components. General properties of passive components.
7. Resistors. Connection of resistors. Applications.
8. Electrical Capacitor. Electrical Capacity. Equivalent capacitance of capacitors
9. Coil. Inductance. The Law of Induction. Energy and forces of the magnetic field.
10. Regimul dinamic în circuite pasive. Circuite RL si RC in curent continuu
11. Circuits in alternating sinusoidal mode. Alternative sinusoidal sizes. Methods of resolving

circuits in sinusoidal mode.

12. Passive circuit elements in the c.a. Circuits with resistors, coils and capacitors in c.a.

English language I – Simona ABRUDAN CACIORA

1. Introductory Seminar. Reading the text entitled "Tools"; Vocabulary and conversation exercises.
2. Materials and Containers. Reading, introducing new phrases, applicative exercises. Cardinal and Ordinal Numerals: Revision.
3. Shapes and Angles. Reading, introducing new words. The plural of nouns: Revision and exercises.
4. Engines (I). Text reading, vocabulary exercises. Countable and uncountable nouns (revision exercises).
5. Engines (II). Text reading, conversation. Number of invariable nouns (revision and exercises).
6. Engines and Fuels. Modal verbs - revision
7. Current, Voltage and Resistance. Text reading. The Present Tense Simple and The Present Tense Continuous (Revision and exercises).
8. Electrical Supply. Reading, Speaking. The Past Tense Simple and The Past Tense Continuous (Revision and Exercises).
9. Facts about matter. Listening and conversation. The Present Perfect versus The Past Tense
10. Circuits and Components. Reading and vocabulary exercises. The Present Perfect Continuous and The Past Tense Continuous.
11. Electrolysis. Reading and conversation based on the text. The Past Perfect Tense Simple and Continuous (Revision and Exercises)
12. Electrical Devices. Communication. Reading and expression of opinions.
13. Batteries. Methods of structuring and writing a descriptive essay. The complex verb "To call".
14. Revision: Cardinal and ordinal numerals, the plural of nouns, means of expressing the present and the past in English.

Physical Education and Sport I

1st year of study – 2nd semester (spring)

Special mathematics – Dorina FECHETE

1. First-order ordinary differential equations
   - Generalities
   - Separable equations
   - Euler homogeneous equations
   - Linear differential equations
   - Existence and uniqueness of solutions
   - Numerical methods for ordinary differential equations
2. Higher order differential equations
   - Generalities
   - Reduction of order
   - n-th order linear differential equations
   - n-th order linear differential equation with constant coefficients
3. Systems of linear differential equations
   - General properties
   - Solution formulas
4. Differential operators
5. Fourier series
6. Fourier transform
7. Laplace transform

Internet programming techniques – Răzvan ALBU

1. Web evolutions, from origins to Web 3.0 and IoT
2. ASP .NET (ASP controls, Web Forms)
3. Web services (SOAP and REST, configuring IIS web server)

4. Windows Communications Foundation (service contracts, hosting, running and consuming WCF services)
5. JavaScript (variables, constants, types, functions, arrays, operators)
6. NodeJS (NPM, Express, asynchronous programming)
7. AngularJS (TypeScript, components, Angular CLI, templates, directives, services, dependency injection)
8. Internet of Things

Material for electronics – Dorel HOBLE

1. Aggregate states of bodies. The crystalline structure.
2. Defects of crystalline networks.
3. Energy bands of the electron in the crystal.
4. Electrical conduction of metals.
5. Conduction of semiconductors.
6. Electrical polarisation.
7. Magnetization
8. Technical and technological properties of electric materials.
9. Conductive materials. Metals.
10. Semiconductors materials.
11. Gaseus and liquid insulating materials.
12. Solid insulating materials.
13. Magnetic materials.
14. Magnetic liquids.

Electronic devices – Adrian BURCA

1. Notions of semiconductor physics
2. The p-n junction. Characteristics.
3. Diodes. Characteristics.
4. Single-phase rectifiers
5. The bipolar transistor (I)
6. The bipolar transistor (II)
7. Polarization of bipolar transistors
8. Unipolar transistors (I). JFET's
9. Unipolar transistors (II). MOSFETs
10. Polarization of unipolar transistors
11. Transistor, low signal (I) amplification schemes
12. Transistor, low signal (II) amplification schemes
13. Multi-junction devices (I) Thyristor, Triac
14. Multi-junction devices (II) IGBT transistor

Fundamentals of Electrical Engineering I – Teodor LEUCA

1. Linear electric circuits in stationary regime
2. Non-linear electric circuits in direct current
3. Linear electric circuits in permanent sinusoidal regime

Computer programming and programming languages – Florin VANCEA

1. Introduction. Hardware reference structure.
2. Algorithms. Programming flowcharts.
3. C program structure
4. Storing data in memory, data type concept, C-specific datatypes, variables.
5. Simple input-output.
6. Assignment, expressions.
7. Cyclic instructions
8. Composed datatypes - arrays, structures.
9. Character string processing.
10. Subprograms - procedures, functions, parameter handling.
11. Variable accessibility.

12. Modularization of large programs.
13. Files. Graphics basic notions.
14. Distributed processing notions. Internet.

Electronic Technology – Nicolae DRĂGHICIU

1. Current trends in electronic technology. Technical issues of electronic engineering, economical technical study, marketing study, design theme, electronic design
2. The technology for making resistors. Wound resistors technology, film resistor technology. Microminiature technologies of resistors. Reliability of resistors.
3. Capacitor design technology. Fixed, variable, adjustable, special capacitor technology. Reliability of capacitors.
4. Coil making technology. Conductive coil construction and technology for winding, coil housing. Types of windings, winding impregnation, core types, cores characteristics
5. Passive electronic component manufacturing technology of the SMD type.
6. Lithography and engraving techniques. Lithography. Photolithography technology. Engraving.
7. Semiconductor diode technology. Behavior of junction p-n, classification of semiconductor diodes. Dotted diodes. Diodes broadcast. Flat epitaxial diodes. Diode Schotty
8. Discrete transistor technology. Bipolar transistor technology. Field effect transistor technology.
9. Embedded circuit technology.
10. Technology of active electronic components of SMD type
11. Harness technology in electronics. Linking technology by soldering. Technology of printed circuits.
12. Technology of SMD components printed circuits. Making unprotected wiring harnesses.
13. Techniques for realizing electronic equipment that meets the requirements of electromagnetic compatibility and signal integrity.
14. Connect the electronic components. Adhesive conductors. Technologies for depositing conductive adhesives.

Mechanical engineering – Titus DELIMAN

1. Fundamental concepts of vectorial computation, basic elements.
2. Definition of triorthogonal reference systems and particular systems.
3. Elements of the kinematics of the material point.
4. Study of radar operating principle reported on position vector properties, assistant software requirements.
5. Analysis of the movement of the crank mechanism, setting the harmonics of the movement of the piston-slide.
6. The Phasors of the Movement.
7. Homogeneous transformation between reference systems. Applications.
8. Elements of relative movement.-Absolute and relative derivative of a mobile vector.
9. Study of relative movement in general case.
10. The technical effects of Coriolis acceleration and its implications for moving the material point.

Physical Education and Sport II

2nd year of study – 1st semester (autumn)

Basic electronic circuits – Adrian BURCA

1. Reaction in Amplifiers (I)
2. Reaction in Amplifiers (II)
3. Features of amplifiers
4. Harmonic oscillators
5. RC oscillators
6. LC oscillators
7. Three-point oscillators with bipolar transistors
8. Three-point oscillators with unipolar transistors
9. Modulation

10. Demodulation
11. Voltage and current stabilizers
12. Protection of stabilizers
13. Switching circuits with discrete elements. bistable.
14. Switching circuits with discrete elements. monostable.

Digital integrated circuits I – Ovidiu NEAMȚU

1. Data in digital systems
2. Boolean Algebra
3. Logical gates
4. Logical circuits in TTL technology
5. Logical circuits in NMOS technology
6. Logical circuits in CMOS technology
7. Logical circuits in I2C technology
8. Validation circuits in the integration architectures
9. Karnaugh diagrams
10. Encoders and decoders
11. Multiplexers and demultiplexers
12. Analysis of Combined Logic Circuits
13. Synthesis of Combined Logic Circuits
14. Applications with logical integrated circuits

Computer aided graphics – Cristian GRAVA

1. Graphical systems
2. Systems of coordinates
3. 2D graphical transformations
4. Visualization transformations
5. Models of reflection and illumination

Computer aided graphics – project - Cristian GRAVA

1. Translation, rotation, zooming
2. Composed and inverse transformations
3. Parallel projections
4. Perspective projections
5. 2D inverse transformations
6. Textures generation

Signals and Systems I – Cornelia GORDAN

1. Generalities I. - Elementary signals defined in continuous and discreet time (signals: unitary step, ramp, signum, exponential, sampling function, unit impulse).
2. Generalities II. - Transformations of the continuous and discreet time variable; Signal energy and power
3. Periodic signals defined in continuous time I. - Fourier series (trigonometric, harmonic, complex); Defining amplitude and phase spectra.
4. Periodic signals defined in continuous time II. - Properties of the Fourier series (symmetry, linearity, Parseval theorem, Gibbs phenomenon, time shift, complex conjugation, reflection, scaling, modulation, derivation, integration, LMS approximation);
5. Periodic signals defined in continuous time III. - Convolution of periodic signals; Calculating the coefficients of the complex form of the Fourier series with the Dirac distribution; Correlation functions.
6. Aperiodic signals defined in continuous time I. - Fourier transform (definitions, conditions of existence, definition of spectra of amplitudes and phases, properties).
7. Aperiodic signals defined in continuous time II. - Laplace transform (definitions, conditions of existence, properties); Correlation functions.
8. Aperiodic signals defined in continuous time III. - Harmonic carrier modulated signals (in

amplitude, frequency, phase); Definition of modulation coefficients, spectral content, useful band, actual value.
9. Periodic signals defined in discrete time. - Fourier series of discrete periodic signals; The properties of these Fourier series; Periodic convolution of discrete signals.
10. Transform. Fourier in discrete time. - Fourier transforms for discreet periodic and aperiodic signals; Properties of the Fourier transform in discrete time.
11. Discrete signals I. - Definition of sampled signals and direct and inverse Fourier transforms for them; The sampling theorem.
12. Discrete signals II. - Transformed z (definition of direct and inverse forms, domain of existence, properties).
13. Discrete signals III. - Modulated pulse bearer signals (amplitude, position).
14. Discrete signals IV. - Impulse carrier modulated signals (in frequency, duration, code, delta).

Fundamentals of Electrical Engineering II – Teodor LEUCA

1. Triple phase electric circuits
2. Linear electric circuits in non-sinusoidal periodic regime
3. The linear electric circuits in transient regime
4. The electromagnetic field in electrostatic regime
5. The electromagnetic field in the electro-kinetic regime
6. The electromagnetic field in the stationary magnetic regime
7. The general (fundamental) laws of the electromagnetic phenomena

Analog integrated circuits – Ioan GAVRILUȚ

1. Introduction. Parameters and characteristics of analog integrated circuits
2. Current sources. Voltage sources
3. Differential amplification stages
4. Output stages (final)
5. The ideal operational amplifier (AO)
6. Basic configurations with AO
7. Parameters of operational amplifiers
8. Internal structure of AO. Static errors
9. Dynamic behavior of AO
10. The summing amplifier circuit
11. Differential input amplifiers
12. Integration circuits. Derivation circuits
13. Precision rectifiers
14. Voltage comparators

Measurements in Electronics and Telecommunications – Marin TOMȘE

1. Introduction. Sizes and units of measure. Means and methods of measurement.
2. Measurement errors. Classification of errors. Mathematical analysis of errors. Random errors. Systematic errors. Processing results.
3. General characteristics of the measuring instruments. Block schemes. Static features. Behavior in dynamic mode. Constructive features.
4. Circuits for expanding the current measuring range. The simple shunt. Multiple shunt. Transformers for measuring current. Rogowski transducers.
5. Circuits for expanding the voltage measuring range. Additional resistor. Resistive, capacitive, inductive voltage dividers. Attenuators. Transformers for voltage measurement.
6. Electronic circuits used in measuring devices. Instrumental Amplifiers. Rectifier precision bialternance.
7. Converters for numerical measurements. Numeric-analog converters. Analog-numeric converters. Voltage-frequency converters.
8. Measurement of voltages and currents. Analogue ammeters. Electronic ammeters for measuring small and very small currents. Measuring high currents. Analog voltmeters.

Electronic voltmeters. Numeric multimeters.
9. Measurement of electrical power. Measurement of active power. Measurement of reactive power.
10. Measurement of electrical energy. Counters
11. Measurement of resistances: volt-ampermetric method, ohmmeters, mega ohmmeters. Wheatstone bridge, double bridge, resistance-to-voltage converters.
12. Measurement of inductances and capacities. AC power bridges. General. Examples of AC bridges for capacitance and inductance measurements.
13. Measurement of frequency, period and phase-out. Analog and numerical methods for frequency, period and phase measurement.
14. Measurements of amplitude and frequency modulated signals.

English language II – Simona ABRUDAN CACIORA

1. Properties of Engineering Materials (I). Reading and conversation. Paragraph building (Structure of a paragraph, linking words).
2. Ferrous Metals. Reading. Means of expressing the future (I)
3. Tensile Strength and Hardness. Reading of texts, means of expressing opinions. The Future Perfect.
4. Properties of Engineering Materials (II). Newspaper Articles The complex verb "To Fall".
5. Solders. Reading. The Infinitive (Revision and Exercises)
6. Speaking Practice. Complex verbs: "To Take". Conversation and means of expressing points of view. Exercises with complex verbs.
7. Mechanisms. Listening to English texts and conversations. The Gerund and the Participle (Review and exercises).
8. Forces in Engineering. Reading, introducing new phrases, argumentation exercises.
9. Writing: Listing and Enumerating Arguments (Enumerating and organizing arguments in a written text). Applicative exercises.
10. The Hovercraft. Text reading, conversation.
11. Changing the Structure of Information in a Sentence: The Passive Voice. Applicative exercises.
12. The Subjunctive Mood. Revision and exercises.
13. Electrical generators. Reading and expressing opinions
14. Revision

Physical Education and Sport III

2nd year of study – 2nd semester (spring)

Object oriented programming – Sorin CURILĂ

1. Object Oriented Programming
2. C++ classes
3. Association-aggregation-derivation
4. MFC Programming
5. MFC Menus
6. MFC Dialog boxes
7. Properties sheets
8. Wizard
9. Values oriented controls. Evolution bar
10. Sliding button
11. Incremental control
12. Serializing data structures

SPICE models – Adrian ȘCHIOP

1. Programs for simulation of circuits
2. The standard definition of electronic components for SPICE and viewing the results
3. Creating and editing components
4. Generating electronic schemes for OrCAD PSpice simulation

5. Types of analysis in PSpice
6. Creating footprints
7. Transfer Techniques SCM – PCB

Signals and Systems II - Cornelia GORDAN

1. Passive electrical filters I. - General; Constant type K filters (general analysis).
2. Passive electrical filters II. - Constant type K filters (low-pass, up-and-down, bandwidth, stop-tape structures).
3. Passive electrical filters III. - Derivative m filters (generalities, m series and parallel derivations, low-pass, up-pass, band-pass structures).
4. Passive electrical filters IV. - Deck filters (generalities, low-pass, over-the-top, pass-band structures).
5. Active electrical filters I. - General; Voltage transfer functions (Butterworth, Cebisev, Bessel, Paynter, etc.).
6. Active electrical filters II. - Simple single-action active filters (generalities, low-pass, over-pass, band-pass structures).
7. Active electrical filters III. - Multiple-response active filters (generalities, low-pass, over-pass, cross-band structures).
8. Active electrical filters IV. - Active second order filters with ordered voltage source (generalities, low-pass structures, pass-over, band-pass).
9. Digital Filters I. - Generalities; Conversion of systems over time into systems in discrete time.
10. Digital Filters II. - Recursive filter structures.
11. Digital Filters III. - Non-recursive filter structures.

Numerical methods – Mihaela NOVAC

1. Matlab programming fundamentals.
2. Introduction in Matlab programming
3. Errors in numerical calculation (sources of error, absolute and relative errors, error propagation, measurement errors).
4. Numerical methods to solve algebric linear systems equations. Exact methods. (Gauss's elimination method, the inverse matrix method, the Gauss-Jordan method, LU factorization method.)
5. Numerical methods to solve algebric linear systems equations. Iterative methods. (The iterative method of Jacobi. Gauss-Seidel iterative method. Successful relaxation method).
6. Numerical methods to solve nonlinear equations (Bisect method, sequence method, false position method, resolution of nonlinear equation systems).
7. Interpolation (Lagrange interpolation polynomial, finite differences and generalized powers (Newton-Gregory polynomials with finite differences), Newton's divided differences formula, Spline functions).
8. Functions approximation (functions approximation using least squares method).
9. Numerical integration (Trapezoidal method, Romberg method, Simpson's method).
10. Numerical derivation (numerical derivation formulas using Taylor series expansion).
11. Numerical methods to solve differential equations (Euler's method, Milne's method, Runge-Kutta method).

Digital integrated circuits II – Ovidiu NEAMȚU

1. Sequential logic circuits
2. Flip-flops type RS
3. Flip-flops type Master-Slave JK
4. D-type and T-type flip-flops circuits
5. Asynchronous counting
6. Synchronous counting
7. High capacity integrated counting
8. Registers

9. Parallel-serial and serial-parallel data converters
10. Monostable circuits
11. Memory circuits: ROM, PROM
12. RAM random access memories
13. Programmable clock circuits
14. Integrated circuits in dedicated applications

Industrial electrotechnics – Marius SILAGHI

1. Introduction in industrial electrotechnics
2. The single-phase electric transformer
3. Construction of DC machines
4. Construction of AC machines
5. Processing materials in electromagnetic field

Theory of Information transmission – Lucian MORGOȘ

1. Introduction to Probability Theory. Random experiment, events. Probability of an event. Random variable. Probabilities of a random variable. Conditional probabilities. The concept of statistical independence. Numerical signals as random variables.
2. Source of information. Information. Definitions and notations. Units of measurement for information. Mutual information of two events.
3. Discrete information sources. Definitions and notations. Classification of discrete sources. Markov sources. Description of Markov sources through state diagrams.
4. Entropy of discrete sources of information. Source entropy without memory. Properties of entropy. Entropy of the binary source. Entropy of Markov source. Decorrelation of Markov source
5. Flow, redundancy, relative redundancy.Conjugated entropy of two sources of information. Mutual information of two sources. Conditional entropy of the source of information. Relationships between entropy (Venn Charts).
6. Channels for transmitting information. Channel classifications. Discrete channels for the transmission of information. The capacity of the discreet channel.
7. Discrete channel models. Channel uniformly towards the entrance. Channel uniformly towards the exit. Symmetric channel. Examples of discrete channels. Binary symmetric channel. Binary channel with errors and cancellations.
8. Information sources and continuous channels. Entropy of the continuing information source. The significance of the entropy of a continuous source. Fundamental inequality in the case of continuous distributions. Cases of maximum entropy. Variation of entropy with change of signal representation space.
9. Continuous channels for the transmission of information. Mutual information in continuous channels. Mutual information properties in continuous channels. Continuous channel capacity.
10. Source coding. Classification of source codes. Instant or irreducible codes. Absolutely optimal codes. Optimal codes. Capacity, efficiency and redundancy of codes. Expanding a source of information. Shannon's first Theorem.
11. Algorithms of entropic coding. Shannon-Fano coding. Coding Huffman. Arithmetic coding.
12. Channel encoding. The probability of decoding error. Coding by repeating symbols. Shannon's 2nd theorem. The space of words. Graphic representation of words. Hamming distance. Detecting Errors and Correct Errors. Specifying meaningful words.
13. Correction Codes / Error Detectors. Group codes. Coding. Decoding. Relationships between columns of the control matrix H. Correction Hamming code group of an error.
14. Cyclic codes. Representing codewords as polynomials. The space of the words. Multiply the decomposition classes modulo p (x) = xn +1. Specifying meaningful words. Coding. Decoding. Coding using polynomial h(x). Coding using matrix computation.

English language III - Simona ABRUDAN CACIORA

1. Introductory Seminar. Reading the text entitled "An Introduction to Computers"; Vocabulary and conversation exercises.

2. First Approach to Software. Reading, introducing new phrases, applicative exercises. Cardinal and Ordinal Numerals: Applications.
3. The Computers and their Processing Abilities. Reading, introducing new words. The plural of nouns: Revision and exercises
4. Major Computer Applications. Reading, vocabulary exercises. Countable and uncountable nouns (revision exercises).
5. Computers and Algorithms. Text reading, conversation. The number of invariable nouns (revision and exercises).
6. Human Intelligence vs. Artificial Intelligence. Text reading.
7. Computer Ergonomics. Text reading. Modal verbs (revision).
8. Levels of Intelligence. Reading, Speaking.
9. Lasers. Listening and conversation.
10. Uses of Ultrasound. Reading and vocabulary exercises.
11. The Electronic Brain. Reading and conversation based on the text.
12. Online communication: Internet and IT Vocabulary. Writing e-mails.
13. Robots. Reading of texts, expressing opinions.
14. Revision.

Physical Education and Sport IV

3rd year of study – 1st semester (autumn)

Industrial Electronics – Daniel TRIP

1. Introduction. Power electronic devices – overview.
2. Single phase rectifiers with resistive load. Conversion efficiency.
3. Controlled rectifiers. Three phase rectifiers.
4. Rectifiers with resistive – inductive load.
5. PWM rectifiers. Filtering circuits.
6. Voltage regulators. IC voltage regulators.
7. Voltage regulators family 78xx. Applications.
8. Switched mode power supplies. Introduction.
9. DC-DC Buck converter.
10. DC-DC Boost and Buck-boost converters.
11. DC-DC Forward and Fly-back converters.
12. Power factor correction circuits. Uninterruptible power supply.
13. PWM Inverters.
14. Resonant conversion of electric energy.

Industrial Electronics – project – Adrian BURCĂ

1. Design of power conversion equipment: rectifiers, switching mode power supplies, regulators etc. in the field of industrial electronics. Basic concepts. Presentation of the design stages and designing themes.
2. Design of coils and transformers on ferrite core.
3. Design of rectifying and filtering circuits.
4. Design of control circuits for electronic power devices.
5. Design of protection circuits.
6. Design concepts for printed circuit boards and radiators for electronic power supplies.
7. The way to elaborate and present the content of the project.

Nano and micro technologies for electronics – Liviu MOLDOVAN

1. Introduction
2. Silicon. Physical and chemical properties. Manufacture of silicon wafers
3. Silicon wafers cleaning techniques. Good cleanroom practices
4. Photolithography (what it is, what it uses, what are the properties of the photosensitive resin, how to obtain different cross section profiles)
5. Electronic lithography (what it is, how it is used, how to use electronic scanning microscope in

electronic lithography, what are the properties of PMMA, what are the advantages and disadvantages of photolithography)
6. Dry etching (what is plasma, principles of plasma etching, choice of gases depending by the material to be etched)
7. Wet etching (how to use acids and bases for wet etching, wet etching principles, choice of acids or bases depending by the material to be etched)
8. Oxidation (physical and chemical phenomena occurred in the oxidation process, types of oxidation, conditions necessary to use oxidation during a technological process)
9. Semiconductors doping (physical and chemical phenomena involved in the doping process, types of oxidation, conditions necessary to use oxidation during a technological process)
10. Vapors deposition and chemical deposition (evaporator operating principle, conditions for choice of vaporization or chemical deposition, commonly used materials)
11. Molecular beam epitaxy (principle of epitaxial growth, functioning of devices necessary for epitaxial growth, measures to prevent contamination with impurities, techniques for a suitable vacuum)
12. Geometric characterization techniques (Profile characterization using dektak, electron microscopy and ellipsometry measurements)
13. Electrical characterization techniques (four point method)
14. Nano-Impression Techniques

Nano and Microtechnologies for electronics – Project - Liviu MOLDOVAN

1. The steps of the realization of a project in nano and micro technologies
2. The steps of a concrete project theme
3. The proposal of a succession of technological processes
4. Determining of alternative methods of project realization
5. Establishment of the chosen method according to advantages and disadvantages
6. Defending the project

Fundamentals of data acquisition systems – Alexandru GACSÁDI

1. Introduction to data acquisition systems (DAQ); basic components of the data acquisition and control systems (transducers – sensors and actuators).
2. Sampling and signal reconstruction; binary codes.
3. Analog signal conditioning circuits; analog switches and multiplexers.
4. Amplifiers; operational amplifier; instrumentation amplifier; programmable-gain amplifiers; isolation amplifiers.
5. Sample and hold circuit; characteristics and implementation.
6. Digital-to-analog converter (DAC); characteristics of DAC.
7. Digital-to-analog converter types.
8. Analog-to-digital converter (ADC); characteristics of ADC.
9. ADC architectures; direct-conversion (pipeline) ADC; successive-approximation converter; counter type ADC.
10. Data acquisition and distributions system architectures; fundamental structures for one ore multichannel analogue inputs; multiplexed and simultaneous DAQ.
11. Standard communication interfaces; RS-232.
12. Standard interfaces; I2C; IEEE-488.
13. DAQ application example for slow processes.
14. DAQ application example for fast processes.

Digital Signal Processing – Sorin CURILĂ

1. Signals and systems
2. Convolution of discrete signals
3. Correlation of discrete signals
4. Fourier transform.
5. Z transform.
6. Own Vectors - own values.

7. Orthogonal unit transformations.
8. Rectangular transformations.
9. Transformations based on own vectors.
10. Wavelet transform

Electrical Drives – Viorica SPOIALĂ

1. Specific elements of the electric drives systems
2. DC motors electric drives
3. Induction motors electric drives
4. Synchronous motors electric drives
5. Special electric drives

Microprocessors and Microcontrollers – Daniel TRIP

1. Introduction. Microprocessors and microcontrollers overview.
2. Data format for microprocessors and microcontrollers.
3. Intel 8086 microprocessor. Architecture of Intel 8086 microprocessor.
4. Demultiplexing of the external bus. Writing and reading cycles. Interrupt system.
5. Modern architectures of microprocessors. New operation concepts of the new microprocessors.
6. RISC architecture. Roles of the microcontrollers.
7. Example of microcontroller architecture. Main resources of a general purpose microcontroller.
8. Microcontrollers ports. Port initialization and use. Electrical specifications.
9. Interrupt system at microcontrollers.
10. Timers and serial ports at microcontrollers.
11. ADC and CCP (PWM) modules at microcontrollers.
12. General design concepts of circuits based on microcontrollers.
13. Implementation and programming concepts for circuits based on microcontrollers.
14. Applications. Implementation examples.

Microprocessors and microcontrollers – project - Daniel TRIP

1. Presentation of the main concepts regarding the use of microcontrollers. Basic concepts. Presentation of the design stages and designing themes.
2. Implementing a logical diagram for an application based on the requirements and facilities offered by the microcontroller.
3. Designing the application's electronic circuit using a microcontroller.
4. Circuit implementation on a test board or use a development / test board. Implementing the application algorithm.
5. Programming and testing the application.
6. Design concepts for printed circuit boards based on microcontrollers.
7. The way to elaborate and present the content of the project

Industrial management – Marius ROMOCEA

1. Introduction in management science
2. Concept and content of environmental factors
3. Planning as a process
4. Organizational and competitive strategies
5. Planning in the enterprise
6. Planning in the research and development function
7. Planning in the production function
8. Human resources planning
9. Organization in the industrial enterprise
10. Departments in industrial enterprise
11. Job analysis
12. Control in the industrial enterprise

3rd year of study – 2nd semester (spring)

Reliability – Ovidiu NOVAC

1. Introduction
2. Basic concepts of reliability. Reliability parameters. Modeling of equipment wear
3. Basic concepts of reliability. Maintainability. Maintenance. Availability.
4. Basic concepts of reliability. Distribution Laws
5. Reliability Models. Functional model. The logical model. Markov models and block diagram of reliability. Markovs matrix formulation
6. Reliability models. Applications to composite systems. Model of the failure shaft
7. Tolerance equipments to faults. Introduction. Algorithms for detection and diagnosis of failures
8. Tolerance equipments to faults. Redundant structures for implementing fault tolerance
9. Technics to improve reliability and availability. Methods of generating test sequences used in defect diagnosis. Testing methods.
10. Techniques to improve reliability and availability. Self-checking equipment. Methods of providing easy testability.
11. Techniques for improving reliability and availability. Specific problems of fault tolerance implementation techniques. Techniques to reconfigure equipment when malfunctions occur.
12. Reliability of electronic devices and computing systems. Introduction. Design of electronic devices and computing systems.
13. Reliability of electronic devices and computing systems. Reliability of programs.
14. Reliability tests

Television - Alexandru GACSÁDI

1. Basics of color television.
2. Television systems. The TV principle.
3. Linear scanning and interlaced scanning; resolution.
4. The composite color television video signal.
5. The characteristics of the video signal; time and frequency representation; the frequency spectrum.
6. The structure of a compatible color TV system.
7. The PAL color television system; quadrature amplitude modulation, composite PAL color video signal.
8. The PAL color television system; PAL encoder block diagram; PAL decoder block diagram.
9. Integrated video cameras; image sensors; charge coupled devices (CCD)
10. Display devices for television; video display monitors.
11. TV transmission; broadcasting, cable TV broadcasting, satellite TV.
12. Analog-digital television systems.
13. Digital Television (DTV); Digital Video Broadcasting; DVB-T System
14. Digital Video Broadcasting; DVB-C System; DVB-S System;

Image Processing and Analysis – Cristian GRAVA

1. Image digitization
2. Images' spatial representation
3. Images' spectral representation
4. Image enhancement
5. Linear and non-linear image filtering
6. Mathematical morphology applied in image processing
7. Image segmentation
8. Image compression

Power Electronic Converters – Ovidiu NEAMȚU

1. Electronic power converters - efficiency and performance criteria
2. Power factor and line current harmonics for rectifiers
3. DC-AC converters used for harvesting renewable energies
4. AC-DC converters used for harvesting renewable energies
5. Variators of continuous voltage
6. Optoelectronic interfaces for the transfer of signals to the power modules of the electronic

converters
7. Converters controlled from PC with Simulink-Matlab
8. Simulink simulation and configuration for real-time control and operation
9. Converters for wind farm
10. Converters for photovoltaic power
11. Converters for geothermal power plant
12. Expert systems, fuzzy logic, neural networks used in command of the a.c. motor
13. DSP for driving electronic converters
14. BLAC motor drive with DSP

Microwaves – Liviu MOLDOVAN

1. Main theoretical aspects of electromagnetism. Maxwell's equations Classification of electromagnetic waves.
2. Wave–particle duality. Flat electromagnetic waves. Electromagnetic waves directed between conductive surfaces
3. Microwave Engineering Modes of Propagation. Waveguides modes. Wavelength and the Wave Impedance
4. Transverse Electromagnetic Wave. Transverse Electric Wave. Transverse Magnetic Wave. Hybrid Wave
5. Multi-conductor Lines. Co-axial Lines. Strip Lines. Micro Strip Lines. Other Lines.
6. Electromagnetic Waveguides. Transmission Lines Vs Waveguides.
7. Smith chart.
8. Reflex Klystron. Construction of Reflex Klystron. Operation of Reflex Klystron. Applications of Reflex Klystron
9. Travelling Wave Tube. Construction of Travelling Wave Tube. Operation of Travelling Wave Tube. Applications of Travelling Wave Tube.
10. Magnetrons. Cavity Magnetron. Construction of Cavity Magnetron. Operation of Cavity Magnetron with Active RF Field.
11. Microwave Amplifiers (stability of microwave transistor amplifiers, power amplification, amplifier noise, microwave transistor polarization aspects, semiconductor microwave amplifiers). Microwave oscillators.
12. Antennas and propagation of electromagnetic waves.

General Economics – Constantin RADA

1. Subject of general economics
2. Law character of economics
3. Economical activity
4. Economical needs and interests
5. The enterprise
6. Consumer behavior
7. The market
8. Economic competition
9. Selling prices
10. Consumption and savings
11. Economic growth
12. Entrepreneur’s profit
13. Cyclicality of economic activities
14. Relations with the international market

Analog and Digital Transmissions – Sorin POPA

1. Introduction. Development of communications technology and microelectronics
2. Terms and notions of communications.
3. Transmission characteristics. Lines of transmission. Communication services.
4. Telephone equipment. The principle of multiplexing TDMA, FDMA, CDMA.
5. Digital telephony. A / N conversion, sampling, quantization, encoding.

6. Digital transmissions. Transmission media. Digital transmission quality.
7. Transfer modes for STM-ATM digital signals. Digital synchronous hierarchies.
8. Communication, structure and topology networks.
9. Layered architectures, multiplexing and switching techniques.
10. Digital transmission systems. Codes.
11. Communication data, description, structure of a CD system.
12. Data communications networks. Representation of data.
13. Transmission in the baseband.
14. Modulations used in data communication, ASK, PSK, FSK.

Computer Architecture – Ovidiu NEAMȚU

1. Block structure of PCs
2. Soft driver for electronics management on the motherboard
3. Communications between internal components of PC systems
4. Chipset in the architecture of the evolved PC systems
5. External communications with other PC systems
6. Software configurations for direct electronic actions in Matlab-Simulink
7. Intel's internal processor architecture
8. Complex instructions integrated into modern processors
9. Magnetic storage units
10. Optical storage units
11. High capacity electronic storage units
12. Graphical interface
13. Applicative extensions for a computer
14. Maintaining hardware and software integrity of PC systems

4th year of study – 1st semester (autumn)

Digital Signal Processors – Daniel TRIP

1. Generalities about digital signal processors. Harvard architecture.
2. Representing data in digital signal processors.
3. State-of-the-art in numeric signal processors in floating point and floating point. General and specific features.
4. Configuring and Addressing Memory.
5. Arithmetic and logic unit.
6. Working in "pipe-line" technique.
7. Instructions and instruction blocks that repeats them.
8. Status and control registers. Interrupt system.
9. I / O ports. Pins of general use. Timing circuits. Serial communication ports.
10. Using ADC and PWM modules on signal processors.
11. General concepts regarding the implementation of signal processing algorithms.
12. Implementation of FIR type numeric filters.
13. Implementation of IIR type filters.
14. Implementing a PWM control circuit with signal processor.

Medical electronics – Nicolae DRĂGHICIU

1. Bioelectric phenomenon, the collection of electrical signals
2. Types of electrodes
3. Traductors used in medical electronics
4. Emplification of bioelectric signals
5. Electrostimulation of tissues
6. Measuring electrical activity of the nervous system
7. Electroencefalograful
8. Measurement and processing of cardiac activity
9. Electrocardiograph, semiautomatic ECG processing

10. The respiratory system and its investigation
11. Traductors and devices used in respiratory exploration
12. Electroterapia
13. Decision diagnosis by ultrasound
14. Ultrasonic traductors, ultrasound

Automata System Design – Eugen GERGELY

1. The computing systems and the industrial control
2. The structure of programable logic controllers
3. Programming languages
4. Special functions
5. Programming methods
6. Analog signals, PLC closed loop control and intelligent modules
7. The man-machine interface

Optoelectronics – Simona CASTRASE

1. Optoelectronics. Definitions, basic concepts.
2. Electromagnetic wave. The propagation equation. Properties.
3. Electromagnetic radiation. Curly Aspects. Spectrum of electromagnetic waves. Reflection and refraction of electromagnetic waves
4. Absorption, diffusion and dispersion of light, Optical nonlinear phenomena
5. Light Sources and Black Radiation Body Aspects of Electromagnetic Radiation. Stimulated emission of electromagnetic radiation. The Laser Effect
6. Optoelectronic devices. Receptors for electromagnetic radiation. General notions. Photoresistor. Photodiodes. Photoelements.
7. Photodiodes p-i-n.Photodiodes with an avalanche. Phototransistors
8. Dimensions specific to photodetectors. Limiting detector performance. The noise.
9. Electromagnetic radiation emitting devices. Luminescent diodes. Lasers with semiconductors. Laser diodes.
10. Dual diode laser heterostructure. Quantum gravity lasers and quantum center lasers.
11. Optical modulators. Electro-optical modulation devices. Acousto-optic modulators
12. Optical amplifiers. Fiber optic amplifiers with erbium. Raman amplifiers. Pumping lasers
13. Optoelectronic systems. Optical communication systems and channel.Parameters. Communication System Conduct

Control of Electronic Equipment – Adrian ȘCHIOP

1. Control techniques of voltage and current source inverters. 180 0program operation.
2. Voltage equations. Defining space vectors. Unipolar and bipolar modulation for single phase inverters.
3. Sinusoidal pulse width modulation for three phase inverter. Selective harmonic elimination.
4. Space vector modulation
5. Neutral point control of multilevel inverter.
6. Control of flying capacitor multilevel inverter. Control of Cascaded H- bridge multilevel inverter.
7. PWM techniques for multilevel inverter.
8. Vector control of voltage source inverter. Vector control of current source inverter
9. Power Factor Correction circuits

Virtual instrumentation for electronic systems – Marin TOMȘE

1. Getting Started. Virtual Instrumentation. General principles. Software for Virtual Instrumentation.
2. Introduction to LabVIEW. Elements in LabVIEW.
3. Creating, editing and debugging a virtual tool.
4. Creating virtual sub tools
5. Functions for scaling values

6. Own menus and element design
7. Programming structures
8. Functions for vector values. Cluster data.
9. Graphic representations
10. Virtual instruments for the acquisition and generation of signals
11. Internet communications in LabVIEW. Call LabVIEW applications from web pages
12. Virtual Instrumentation with VEE-Agilent
13. Virtual Instrumentation with dSPACE
14. Practical problems of interfacing virtual instruments

Electronic systems in robotics - Alexandru GACSÁDI

1. Introduction to robotics.
2. Flexible manufacturing systems. Computer integrated manufacturing (CIM).
3. Classification of robots. Structure of industrial robots.
4. The mechanical system of an robot.
5. Geometric kinematic models; coordinates transformations.
6. Robots control methods; motion planning.
7. Internal sensors; position measurement methods.
8. Velocity measurement methods.
9. Actuators in robotics; electrical actuators.
10. Pneumatic and hydraulic actuators.
11. The robot's sensory system. smart sensors.
12. Proximity sensors; tactile sensors.
13. Force sensors and moment sensors.
14. Visual sensors. Vision-based navigation.

Computer Vision – Cristian GRAVA

1. Human vision. Eye structure. Visual acuity
2. Color's physics
3. Linear color spaces
4. Non-linear color spaces
5. The model of the color image
6. Basics of artificial vision in static images
7. Basics of artificial vision in image sequences

4th year of study – 2nd semester (spring)

Ultrasounds Applications – Nicolae DRĂGHICIU

1. Wave types Longitudinal Wave , wave equation, wave interference, ultrasonic wave attenuation.
2. Acoustic sizes - Specific acoustic impedance, acoustic energy density, acoustic intensity
3. Acoustic wave propagation phenomena - flat wave reflection and refraction, diffraction and diffusion of acoustic waves
4. Production of ultrasounds - Mechanical transmitters, magnetic emitter.
5. Production of ultrasounds - Electromagnetic Transmitter, Piezoelectric Transmitter
6. Ultrasound propagation - ultrasound propagation in gas, ultrasound propagation in liquids, ultrasound propagation in solids.
7. Ultrasound detection - Mechanical methods of ultrasonic detection in gases, mechanical methods of ultrasound detection in liquids and solids, ultrasound detection after thermal and optical effect
8. Measurement of ultrasonic wave propagation constants - Measurement of longitudinal wave velocity, measurement of attenuation constant
9. Passive Ultrasound Applications - Ultrasonic Defectoscopy
10. Passive Applications of Ultrasounds I - Ultrasound Thickness Measurement, Surveying and Submarine Scoring, Detection of Physical Parameters in Fluids

11. Passive Applications of Ultrasounds II - Diagnosis and Medical Ultrasound Treatment
12. Active applications of ultrasounds - Mechanical processing using ultrasounds
13. Active applications of ultrasounds I - Ultrasonic cleaning, ultrasound welding
14. Active applications of ultrasounds II - Ultrasonic particle deposition, emulsion formation by ultrasound, ultrasonic drying

Neural Networks – Romulus REIZ

1. Introduction – Artificial Neural Networks. Definition. Properties. Biological neuron. Artificial Neuron
2. Preceptron neural networks I – Simple perceptron ADALINE network. LMS algorithm.
3. Preceptron neural networks II. Multilayer perceptron. Training algorithm.
4. Perceptron neural networks III – fast training algorithms for feedforward networks.
5. Radial basis founction networks. Interpolation. Learning strategies
6. Recurrent networks – Hopfield networks.
7. Self organizing networks I – Hebbian learning.
8. Self organizing networks I - Competitive learning. SOFM algorithms.
9. Hybrid intelligent systems I – genetic algorithms, evolution strategies
10. Hybrid intelligent systems II – Hybrid neurogenetic systems, fuzzy logic systems, neuro-fuzzy systems.
11. Hybrid intelligent systems III - Learning by hardening, specific algorithms: value-based methods, dynamic programming methods, Monte Carlo methods
12. Implementation of neural networks - Software implementation. Hardware, analogue and digital implementation, hybrid implementations
13. Neural Network Applications I - XOR Issue, Parity Issue, Coding Problem.
14. Applications of Neural Networks II - Synthesis of Speech. Automatic speech recognition. Face Detection.

Pattern recognition in electronics and Telecommunications – Sorin CURILĂ

1. Concepts of Pattern Recognition theory
2. Recognizing objects using models
3. Computer techniques used by recognition systems
4. Local-based recognition
5. Comparative analysis of filtering in the frequency and space fields. Specific Applications for Pattern Recognition.
6. Detecting the characteristic points in the image
7. Hough transform
8. Applications of Morphological Transform in Pattern Recognition

Reconfigurable electronic systems – Răzvan ALBU

1. Introduction
2. Reconfigurable systems structure
3. FPGA Programming methods
4. Introducing in VIVADO IDE
5. Reconfigurable systems programming applications architecture
6. Functions and libraries for FPGA programming
7. FPGA/IO tools
8. Data synchronization and parallel execution
9. Data transfer and synchronization between PC and FPGA
10. Optimizing FPGA applications
11. Code reusing, importing external IPs
12. Improvements for reconfigurable systems

Practice for diploma project development -

Optical Communication – Sorin POPA

1. Introduction. The fundamental problem of communications
2. Medium of Transmission - Constraints
3. Optical Fiber. Optical fiber communication links.
4. Optical Transmitter
5. Fiber optic cable
6. Optical receiver
7. Advantages of Fiber Optic Cable as Transmission Medium.
8. Elements of optical fiber construction and topology
9. Protective Fiber Optic Cover
10. Construction of fiber optic cables
11. Connectors
12. Junction
13. Measurements in optical fiber. Analysis of joint performance.
14. Expanding fiber optic bandwidth by multiple users

Electronic Equipments Testing – Ioan GAVRILUȚ

1. Overview about electronic equipment testing (Introduction. Types of defects)
2. Testing equipment (Logical analyzers. Signature analyzers. Testing of data converters. Self-test electronic equipments)
3. Computer assisted testing (Structure of acquisition boards. Assisted testing of an audio amplifier
4. Electronic boards testing (Manual and Automatic optical inspection (AOI). Electrical parameters testing. Boundary Scan technology)
5. Testing the functional parameters of the radio receivers (Superheterodyne radio receivers. Measuring devices and accessories. Functional parameter testing methods)
6. Testing the functional parameters of the TV receivers (Concepts used in television. Determining the characteristics of the TV receivers)