UNIVERSITY OF CRAIOVA
DEPARTMENT: AUTOMATION, ELECTRONICS AND MECHATRONICS
SPECIALIZATION: MECHATRONICS

1-ST YEAR

1. Mathematical analysis
2. Linear algebra, analytic and differential geometry
3. Physics
4. Materials chemistry
5. Computer programming and programming languages
6. Culture and civilization
7. English
8. Numerical calculus and mathematical statistics
9. Special mathematics
10. Bases of electrotechnics
11. Operating systems
12. Mechanics
13. Computer-aided graphics

2-ND YEAR

1. Linear electronic circuits
2. Numeric devices analysis and synthesis
3. Systems theory
4. Data bases
5. Object-oriented programming
6. Marketing
7. English 3
8. Digital electronics
9. JAVA applications
10. The basics of mechatronic systems
11. The basics of robotics
12. Computer architecture
13. Cognitive psychology
14. English 4
15. Internship 1

3-RD YEAR

1. Operating mechanisms and microsystems
2. Automata and microprogramming
3. Intelligent materials and structures
4. Robot control systems
5. Measurements and traductors
6. Microcontrollers and microprocessors
7. Fluids mechanics
8. Mechatronics
9. Applications of robotic systems
10. Adjustment engineering
11. Data transmission
12. Computer-aided design
13. Industrial software
14. Project management
15. Internship *2

4-TH YEAR

1. Integrated systems
2. Programmable logic controllers
3. Mechatronic systems dynamics
4. Artificial intelligence

Package A

5. Image processing and recognition
6. Information protection technology
7. Flexible mannufacturing systems
8. Acquisition systems and interfaces
9. Mobile robots and microrobots
10. Mechatronic systems testing and reliability
11. Graduation project elaboration

Package A

12. Robot structures modeling and identification
13. Numeric control
14. Programming languages for robots

1-ST YEAR

SUBJECT: MATHEMATICAL ANALYSIS

NUMBER OF CREDIT POINTS: 6
SEMESTER: I
COURSE TYPE: core course
COURSE OBJECTIVES: Introducing the basic notions of differential and integral calculus.
COURSE CONTENT: Fundamental series; metric spaces; complete metric spaces; contraction principle; Numeric series; series of serial power developments; Limits and continuity for multivariable functions; Partial derivatives and differentiability; Local extremes for multivariable functions; Implicitly defined functions; Conditioned extremes; Introduction to integral calculus.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

Predoi, M. , Balan, T. - Mathematical Analysis Vol I. Differential Calculus; Vol II.Integral Calculus

Predoi, M. - Analiza matematica, Ed. Universitaria, Craiova, 1994

Predoi, M. , Racilă, M. , Constantinescu, D. - Teme de calcul diferenţial, Ed.Sitech, Craiova, 2003

Predoi, M. , Racilă, M. , Constantinescu, D. - Teme de calcul integral, Ed.Sitech, Craiova, 2003

SUBJECT: LINEAR ALGEBRA, ANALYTIC AND DIFFERENTIAL GEOMETRY

NUMBER OF CREDIT POINTS: 6
SEMESTER: I
COURSE TYPE: core course
COURSE OBJECTIVES: Introducing the basic notions of linear algebra, analytic and differential geometry: vectorial spaces, linear applications, square shapes, Euclidean spaces, symmetrical operators, free vectors, straight lines and planes, conics and quadrics, plane and space curves, surfaces.
COURSE CONTENT: Vectorial spaces; linear applications; bilinear shapes; square shapes; partial derivatives and differentiability; Euclidian vectorial spaces. Introduction to integral calculus; Free (geometric) vectors; straight lines and planes; conics and quadrics; plane and space curves; Surfaces.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

Vladimirescu, I., Munteanu, F., Algebră liniară, geometrie analitică şi geometrie diferenţială, Ed. Universitaria, Craiova, 2007

Vladimirescu, I., Matematici aplicate, Repr. Univ. Craiova, 1987

Vladimirescu, I., Popescu, M., Algebră liniară şi geometrie analitică, Ed. Univ. Craiova 1994

Vladimirescu, I., Popescu, M., Alg. liniară, geom. n-dimensională, Ed. Radical, Craiova 1996

Radu, C., Algebră liniară, geometrie analitică şi diferenţială, Ed. ALL, Bucureşti, 1998

Vladislav, T., Raşa, I., Matematici financiare şi inginereşti, Ed. Fair Partners, Bucureşti, 2001

Udrişte, C. ş.a., Probleme de algebră, geometrie şi ecuaţii diferenţiale, EDP, Bucureşti, 1981

Stănăşilă, O., Analiză liniară şi geometrie, Ed. ALL, Bucureşti, 2000

Munteanu, F. ş.a., Probleme de alg. liniară, geom. analitică, difer., Ed. Universitaria, Craiova, 2001;

Murărescu, Gh., Curs de algebră liniară şi geometrie analitică, Repr. Univ. Craiova, 1991;

Vraciu, G., Elemente de algebră liniară cu aplicaţii, Ed. Radical, Craiova, 2000;

Belage, A. et autres, Exercices resolus d'algebre lineaire, Masson, Paris, 1983;

Berger, M., Geometry I, II, Springer Verlag, Berlin-Heidelberg, 1987;

Silov, G.E., Mathematical analysis. Finite dimensional spaces, Ed. St. Encicl., Bucureşti, 1983 ;

Brânzănescu, V., Stănăşilă, O., Matematici Speciale, Ed. ALL, Bucureşti 1994.

SUBJECT: PHYSICS

NUMBER OF CREDIT POINTS: 5
SEMESTER: I
COURSE TYPE: core course
COURSE OBJECTIVES: introducing the basic notions in physics; elements of analytic mechanics, thermodynamics, optics and quantum physics.
COURSE CONTENT: Elements of mathematical physics; elements of analytic mechanics, Elements of thermodynamics, Elements of optics, Elements of quantum physics.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

Florea Uliu, Curs de fizica pentru facultatea de electrotehnica, vol.1 si 2, Reprogr.Univ.Craiova 1982, 1986;

Gh. Ciobanu, O. Gherman, L. Saliu, Fizica moleculara, termodinamica si statistica, Ed.Did. si Pedagogica, Bucuresti, 1983;

Culegere de probleme pentru Facultatea de electrotehnica, Reprogr.Univ.Craiova, 1991;

N. Pometescu, Fizica, Ed. Sitech, 2000;

Lucrari practice de fizica, Reprografia Universitatii din Craiova, 1990;

M. Negrea, I. Petrisor, Culegere de probleme de mecanica mediilor deformabile, Reprografia universitatii, 2005.

SUBJECT : MATERIALS CHEMISTRY

NUMBER OF CREDIT POINTS: 3
SEMESTER: I I
COURSE TYPE: core course
COURSE OBJECTIVES: getting students acquainted with the basic notions about atoms, chemical connections, substance properties, solutions, notions of electrochemistry, material corrosion, electrical insulating materials.
COURSE CONTENT: Atomic structure; chemical connections, solutions, chemical balance; notions of electrochemistry; corrosion, metal and alloy protection against corrosion; Electrical insulating materials chemistry**.**
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

Negoiu D. – Tratat de chimie anorganică, Ed. Did. şi Ped., Bucureşti, 1998;

Neniţescu C.D. – Chimie generală, Ed. Did. şi Ped., Bucureşti, 1984;

Murgulescu I.G. – Introducere în chimia fizică, Ed. Academiei Române, Bucureşti, 1976;

Pauling L. – The nature of the chemical bond, J. Chem. Ed., 1991;

Roşu T., Negoiu M. – Bazele chimiei anorganice, Ed. ars Doceni, Bucureşti, 1999;

Lipppard S.J. – Principles of bioinorganic chemistry. University Science Books, 1994;
Atkins P.W., Beran J.A. – General chemistry (2rd edn.), Freeman &Co, New York, 1992;
Marcu Gh. – Chimia compuşilor coordinativi, Ed. Academiei Române, Bucureşti, 1984;
Brezeanu M & colab. – Chimia metalelor, Editura Academiei Române, Bucureşti, 1990;
Spînu C. – Chimie bioanorganică, Editura Universitaria, Craiova, 2003.

SUBJECT : COMPUTER PROGRAMMING AND PROGRAMMING LANGUAGES

NUMBER OF CREDIT POINTS: 6
SEMESTER: I
COURSE TYPE: core course
COURSE OBJECTIVES: Introducing the notions referring to computer programming and programming languages such as C, Matlab, LabView. There are approached basic concepts of procedural programming languages based on data flow.
COURSE CONTENT: Introduction to calculus systems architecture; computer programing fundamentals; programming languages; computer data representation; basic elements of C programming language; Operands and operators in C; Instructions; Structured data types; Pointers; Functions; Preprocessing; Ins/ outs; Elements of advanced programming; MATLAB matrix language; LabVIEW dataflow language.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY :

Plum T., Learning to program in C, Prentice Hall, 1983;
Auslander D.,Tham C., Real-time software for control: program examples in C, Prentice Hall, 1990;
Schild H., Using Turbo C, Borland, Osborne / McGraw Hill, 1988;
Holzner S., Borland C++ Programming, Brady Books, New York, 1992;
Somnea D., Turturea D., Introducere în C++, Programarea orientată pe obiecte, Ed. Tehnică, Bucureşti, 1993;
Marian Gh., Bădică C., Pădeanu L., Limbajul PASCAL, Indrumar de laborator, Reprografia Universităţii din Craiova, 1993;
Negrescu L., Introducere în limbajul C, Editura MicroInformatica, Cluj Napoca, 1993;
Petrovici V., Goicea F., Programarea în limbajul C, Editura Tehnică, Bucureşti, 1993;
Marian Gh., Muşatescu C., Laşcu M., Iordache Şt., Limbajul C, Editura ROM TPT, Craiova, 1999;
Mocanu M., Ghid de programare în limbajele C/C++, Editura SITECH, Craiova, 2001;
Zaharia, M.D., Structuri de date şi algoritmi. Exemple în limbajele C şi C++, Ed. Albastră, Cluj Napoca, 2002;
Kernighan, B.W., Ritchie, D.M., The C programming languages, Englewood. Cliffs, N.J. Prentice-Hall, 1978;
Bulac, C., Iniţiere în Turbo C++ şi Borland C, Editura Teora, Bucureşti, 1995.

SUBJECT : CULTURE AND CIVILISATION

NUMBER OF CREDIT POINTS: 2
SEMESTER: I
COURSE TYPE: complementary
COURSE OBJECTIVES: ??????????????
COURSE CONTENT: ??????????????
TEACHING LANGUAGE: Romanian
EVALUARE: oral examination
BIBLIOGRAPHY: ??????????????????????????????

SUBJECT : ENGLISH

NUMBER OF CREDIT POINTS: 2
SEMESTER: I şi II
COURSE TYPE: complementary
COURSE OBJECTIVES: practising the fundamental vocabulary and conversational structural paradigms which are specific to the domain of exact sciences.
COURSE CONTENT: The Inventor of the Modern Computer; Derivation; Vacuum Tubes; The Noun; Computer Architecture; The Article and Other Determiners; The Invention of the Internet; The Adjective. The Comparison Degree; Internet Connection; The Cardinal and Ordinal Numeral; Floppy; The Pronoun; E-mail; The Adverb. Comparison Degrees; Browsing the Web; The Preposition; Downloading; The Verb. General Notions; Operating Systems; Present Tenses; Internet Ethics; Past Tenses; Robotics; Future Tenses; Robot Tasks; The Active Voice; The Passive Voice; The History of Robotics; IF Clauses; Domains of Use for Robots; Reported Speech; The Three Laws of Robotics; Word Order; Cybernetics; Artificial Intelligence; Computer Viruses; Letter of Intent; The Symptoms of Internet Addiction; Letter of Application (I); Letter of Application (II); Language register: Formal Style; National Aeronautics and Space Administration; Are You Cut Out To Be An Astronaut?; Man and Machine; A Menace to Humanity.
TEACHING LANGUAGE: Romanian
EVALUARE: oral examination
BIBLIOGRAPHY :

Munteanu, S.C., Read Science! UTPress, Cluj- Napoca, 2004;
Munteanu, S.C., Students' English Grammar, UTPress, Cluj-Napoca, 2001;
Mercea, R., Application File, UTPres, Cluj-Napoca, 2003;
Thomson, A.J. & Martinet, A.V., A Practical English Grammar, Exercises 1&2, OUP, Oxford, 1995;
Vizental, Adriana - Strategies of Teaching and Testing English as a Foreign Language, Editura Polirom, 2008;
Rivers, Wilga M., Teaching Foreign Language Skills, The University of Chicago Press, Chicago, 1986.

SUBJECT : NUMERICAL CALCULUS AND MATHEMATICAL STATISTICS

NUMBER OF CREDIT POINTS: 4
SEMESTER: II
COURSE TYPE: core course
COURSE OBJECTIVES: To present the students the main numerical methods and algorithms used in: linear and nonlinear algebra, function aproximation, differential and integral calculus, numerical solutions for differential equations with partial derivatives, elements of mathematical statistics.
COURSE CONTENT: Numerical methods in algebra; Function aproximation; Numerical methods for integral evaluation; Numerical methods used to solve differential equations and equations with partial derivatives**;** Elements of probability calculus and mathematical statistics.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

Burden R. L., Faires J. D., Numerical Analysis, Brooks Cole Ed., 2004;

C de Boor, A practical guide to splines, 2nd ed. Springer, NewYork, 2000;
Ciarlet P.G., Introduction à l'Analyse Numérique et l'Optimisation, Ed. Masson, Paris, 1990;
Chatelin F., Spectral approximation of linear operators, Academic Press, New York, 1983;
Demidovici B., Maron I., Éléments de Calcul Numérique, Ed. Mir Moscou, 1973;
Ebâncă D., Metode numerice in algebră, Editura Sitech, Craiova, 2005;
Mihoc Gh., Micu N., Teoria probabilităţilor si statistică matematică, E. D.P., Bucuresti, 1980;
Militaru R., Méthodes Numériques. Théorie et Applications, Ed. Sitech, Craiova, 2008;
Philips G., Taylor T., Theory and Applications of Numerical Analysis, Academic Press, 1999;
Popa M., Militaru R., Analiză Numerică , Note de curs, Ed. Sitech, Craiova, 2003;
Popa M., Militaru R., Metode numerice - algoritmi şi aplicaţii, Ed. Sitech, Craiova, 2007.

SUBJECT : SPECIAL MATHEMATICS

NUMBER OF CREDIT POINTS: 6
SEMESTER: II
COURSE TYPE: core course
COURSE OBJECTIVES: Introducing basic notions concerning: complex analysis, ordinary differential equations, differential equations with partial derivatives, Fourier analysis, Laplace transformations, vectorial fields. The course aims at defining the notions clearly, presenting the basic results, domains of application, solving algorithms, connections with other domains.
COURSE CONTENT: Complex analysis; ordinary differential equations; Fourier analysis – Fourier series; Laplace transformation and Laplace discrete transformation; Fourier transformation; Linear differential equations with partial second order derivatives; vectorial fields, scalar potential, vectorial potential.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

T. Balan, Matematici Speciale - curs, 1998;
C. Niculescu, Matematici Speciale - curs, 1988;
B. Cirstici, Matematici Speciale - curs, 1981;
R. Trandafir, Matematici superioare - probleme;
George Popescu, Matematici Speciale (curs în format electronic); Probleme rezolvate, exemple (în format electronic).

SUBJECT : BASES OF ELECTROTECHNICS

NUMBER OF CREDIT POINTS: 6
SEMESTER: II
COURSE TYPE: core course
COURSE OBJECTIVES: Introducing the basic concepts concerning electric circuits, presenting the main theorems and calculus methods which are applicable in linear and nonlinear circuits analysis.
COURSE CONTENT: Electric circuits and circuit elements; direct current linear circuits; Nonlinear direct current circuits; The sinusoidal regime of electric circuits; Monophased sinusoidal regime circuits; Triphased electric circuits; Quadrupoles and electrical filters; Non-sinusoidal periodic regime of electric circuits; The transitory regime of electric circuits; Distributed parametres circuits.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

D.Topan, Circuits electriques, Editura Universitaria, 1996;
D.Topan, L.Mandache, Metode de analiză în circuite electrice complexe, Ed. Universitaria, 2002;
D. Topan, L.Mandache, Chestiuni speciale de analiza circuitelor electrice, Ed. Universitaria, 2007;
M. Iordache, L. Dumitriu, Teoria circuitelor electrice, Ed. Matrix Rom, 2007;
M. Preda, P.Cristea, Bazele electrotehnicii, vol.2, EDP, 1980;
M. Iordache, L. Dumitriu, Teoriamoderna a circuitelor electrice, vol.1 şi vol. 2, Ed. ALL, 2000.

SUBJECT : OPERATING SYSTEMS

NUMBER OF CREDIT POINTS: 5
SEMESTER: II
COURSE TYPE: core course
COURSE OBJECTIVES: Establishing the component elements of an electrically operated system; the analysis of its functioning; Correlating a working machine with the adequate operating system; the interaction between a static converter and an electric motor part of an operating system.
COURSE CONTENT: The structure of an electric operating system; Static power converters (SPC); Operating systems with direct current motors; operating systems with three phase asynchronous motors (TASM); robot operating system.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

Bitoleanu, Alex, Convertoare statice - Aplicaţii: Sisteme de acţionare electrică, Ed. Universitaria, Craiova;
Bitoleanu, Alex.; Ivanov, S.; Popescu Mihaela, Convertoare statice Ed. Infomed, Craiova, 1997;
Manolea, Ghe.; Degeratu, Pr; Bitoleanu, Alex.; Mihai, Dan, Actionari electromecanice, Reprografia Univ. Craiova, 1991;
Manolea, Ghe.; Sisteme automate de actionare electromecanica, Ed. Universitaria, Craiova, 2004;
Subtirelu, E., Sisteme de actionare – Notite de curs, anul II, Facultatea de Automatica, Calculatoare si Electronica, 2008-2009

SUBJECT : MECHANICS

NUMBER OF CREDIT POINTS: 4
SEMESTER: II
COURSE TYPE: core course
COURSE OBJECTIVES: Introducing the basic concepts concerning the methods of making mathematical models describing the movement of mechanic systems with constant mass and a finite number of freedom degrees. Their analysis is accompanied by calculus examples and applications which illustrate the studied methods.
COURSE CONTENT: Sliding vectors theory; Geometry of masses; Material point kinematics; The kinematics of rigid solids and rigid systems; Dynamics.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

Bagnaru, D., Cataneanu, A., Mecanică-Mecanisme, Editura Sitech, Craiova, 1997;
Buculei, M., Mecanică, vol. I, II, Reprografia Universitatii din Craiova, 1980;
Cătăneanu, A., Mecanică, vol. I,II, Editura Universitaria, Craiova, 2000, 2001;
Cătăneanu, A., Mecanică –Culegere de probleme Ed. Universitaria, Craiova, 2002;

Ceauşu, V, Enescu, N., Ceauşu, F., Culegere de probleme, Mecanică, vol. I. Statică şi cinematică, Ed. Printech, Bucureşti, 1997;
Darabont, A., Vaiteanu, D., Munteanu, M., Mecanică tehnică. Culegere de probleme, Ed. Scrisul Românesc, Craiova, 1983;
Ispas, V., Aplicaţiile cinematicii în construcţia manipulatoarelor şi roboţilor industriali, Ed. Academiei Romane, Bucureşti 1990;
Mangeron, D., Irimiciuc, N., Mecanica rigidelor cu aplicaţii în inginerie, Vol. I, II, III, Ed. Tehnica, Bucureşti, 1978, 1980, 1981;
Merches, I., Burlacu, L., Applied Analytical Mechanics,The Voice of Bucovina Press, Iasi, 1995;
Staicu, St., s.a, Probleme de mecanică teoretică. Mecanică analitică, Universitatea Politehnica Bucureşti, 1996;
Voinea, R., Voiculescu, D., Simion, F. P., Introducere în mecanica solidului rigid cu aplicaţii în inginerie, Ed. Academiei, Bucureşti, 1989.

SUBJECT : COMPUTER AIDED GRAPHICS

NUMBER OF CREDIT POINTS: 3
SEMESTER: II
COURSE TYPE: core course
COURSE OBJECTIVES: Introducing the basic notions of computer-aided graphics: theoretical notions of technical graphics, general aspects of computer graphics, bidimensional and tridimensional AutoCAD.
COURSE CONTENT: General notions of technical drawing and computer graphics; bidimensional and tridimensional modeling.
TEACHING LANGUAGE: Romanian
EVALUARE: oral examination
BIBLIOGRAPHY:

Gherghina, G., Popa D., Calbureanu M., Tudor M., Grafică asistată de calculator, Reprografia Universităţii din Craiova, 1999;
Gherghina, G., Popa, D., Calbureanu, M., Tudor, M., Grafică asistată de calculator. Două modalităţi de abordare, Reprografia Universităţii din Craiova, 2000.;
Popa, Grafică asistată de calculator, Ed. Sitech, 2003, 154 pag., ISBN 973-657-444-X;
Popa, D., Sass, L., Gherghina, G., Duta, A., Stănescu, G., Grafică asistată de calculator - de la 2D la 3D, 247 pag.,Ed. Sitech, 2007;
Sass, L., Desen geometric, 280 pag., Ed. Tehnica-Info, Chişinău, 2002;
Popa, L. Sass, Grafică asistată de calculator, Ed. Sitech, pp. 269, ISBN 978-973-746-800-0, Craiova 2008.

2-ND YEAR

SUBJECT : LINEAR ELECTRONIC CIRCUITS

NUMBER OF CREDIT POINTS: 6
SEMESTER: I
COURSE TYPE: core course
COURSE OBJECTIVES: providing the basic knowledge about the most important electronic devices and linear electronic circuits and offering the basics of analog electronic systems design and analysis.
COURSE CONTENT: Semiconductor diodes; bipolar transistors; unipolar transistors; amplifiers; active filters; linear stabilisers of constant tension; harmonic oscillators.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

Niculescu E., Purcaru D.M., Dispozitive şi circuite electronice. Vol. I. Ed. Universitaria, 2002;
Niculescu E., Purcaru D.M., Maria, M., Electronică. Simulări, analize şi experimente, Ed. Reprograph, Craiova, 2006;
Spânulescu, I., Dispozitive semiconductoare şi circuite integrate analogice, Ed. Victor, Bucureşti, 1998;
Gray, P.E., Meyer, C.R., Circuite integrate analogice. Analiză şi proiectare, Ed. Tehnică, Bucureşti, 1997;
P. Allen, D. Holberg, CMOS Analog Circuit Design, 2nd Ed., Oxford 2002;
D. Dascalu s.a., Dispozitive şi circuite electronice. Probleme. Ed. Didactică şi Pedagogică, Bucuresti, 1982;
Manolesu, A. Manolescu, Circuite integrate liniare. Culegere de probleme. Ed. Ştiinţifică şi Enciclopedica, Bucuresti, 1987.

SUBJECT : NUMERIC DEVICES ANALYSIS AND SYNTHESIS

NUMBER OF CREDIT POINTS: 5
SEMESTER: I
COURSE TYPE: core course
COURSE OBJECTIVES: Introducing the basic concepts concerning: numeration systems, commutation algebra, MSI and LSI integrated circuits, bistables, counting and registers, the analysis ansd synthesis of synchronous and asynchronous sequential circuits.
COURSE CONTENT: Numeration systems; binary arithmetics, the geometrical representation of binary numbers; commutation algebra; the analysis and synthesis of commutation functions; special properties of commutation functions; commutation circuits hazard; integrated circuits families; MSI integrated circuits; LSI integrated circuits; integrated bistables; counting; seried and paralleled registers; synchronous sequential circuits analysis; the synthesis of synchronous sequential circuits with bistable D and JK; the synthesis of sequential circuts with ROM memories.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

Blakeslee, Th., Proiectarea cu circuite logice MSI şi LSI standard, Ed. Tehnică, Bucureşti, 1988.
Huţanu, C., Circuite logice şi comenzi secvenţiale, Ed. Junimea, Iaşi, 1983.
Maican, S., Sisteme numerice cu circuite integrate, Culegere de probleme, Ed. Tehnică, Bucureşti 1980.

SUBJECT : SYSTEMS THEORY

NUMBER OF CREDIT POINTS: 5
SEMESTER: I
COURSE TYPE: core course
COURSE OBJECTIVES: acquiring the theoretical competence and practical abilities of analytical calculus in the domain of linear and nonlinear automated systems using the adequate MATLAB software.
COURSE CONTENT: Elements of nonlinear automated systems; automated systems with reverse reaction structure. Automated systems statistics. Amplification role and limiting through stability. Root role. Drawing rules and applications. Compensators design. Cascade compensation. State-dependent reversed reaction. State estimation and dynamic compensation. The basic issue of adjustment and applications; Nonlinear and automated systems. General aspects. Nonlinear elements and their description. Nonlinear automated systems models. Nonlinearities classes and systems. Autonomous systems and their signification. First order autonomous systems. Thermostats. Second order systems. State variables plane and movement quality table. Limit cycles and self-oscillations. Nonlinear systems stability. Absolute stability. V.M. Popov's absolute stability criterion.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

C. Belea, Automatica neliniară, Editura Tehnică, Bucureşti, 1983;
Vl. Răsvan, Teoria stabilităţii (Cap. 2), Editura ştiinţifică şi enciclopedică, Bucureşti, 1987;
M. Voicu, Introducere în automatică, Editura Polirom, Iaşi, 2002;
Vl. Răsvan, Systemes nonlineaires, Printech, Bucureşti, 2004;
A.A. Pervozvanski, Curs de Teoria Sistemelor (l. rusă), Nauka, Leningrad, 1986.

SUBJECT : DATA BASES

NUMBER OF CREDIT POINTS: 3
SEMESTER: I
COURSE TYPE: core course
COURSE OBJECTIVES: Introducing the basic concepts and thechniques referring to the methodology of data bases design and assimilating the knowledge about using a system of managing data bases (SGBD).
COURSE CONTENT: Introduction to data bases aspects. The relational model. Relational data bases design (the analysis of imposed specifications, design methods, normalising and denormalising data bases). SQL. Management systems for relational data bases-SGBDR. DB management elements (types of users, creating a DB, administering instances, stock structure and DB objects schema, DB memory and resources, presenting the concepts of Backup, Database Recovery Manager etc.) Data base and user security. Multiple access to data and keeping their consistency. Distributed data bases.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY

Connolly, T., Begg, C., Strachan, A., "Database Systems – A Practical Aproach to Design, Implementation and Management", 1041 pp., Addison Wesley Longman Limited, London, UK, 2003.
Ipate, F.E. s. a.,"Dezvoltarea aplicatiilor de BD in Oracle si Forms", Editura ALL, Bucuresti, 2000.
Hernandez, M.J., "Database Design: a Hands-on Guide to Relational Database Design", 402 pag., Pearson Education, Inc. Publishing Adisson Wesley Professional, 0201752840, New York, USA, 2003.

Lowers, T., Atwood, T., Gennick, J., "PL/SQL", 715 pp., Pearson Education, Inc. – Sams Publishing, New York, USA, 2001.
Welling, L., "Thomson, L., PHP and MYQSL web Development", 813 pp., Pearson Education, Inc. – Sams Publishing, 067232525X, New York, USA, 2004.
***, "Database Design and Programming with SQL", Instructor Guide, Oracle Education, 2008
***, "Database Programming with PL/SQL", Instructor Guide, Oracle Education, 2008
***, "Oracle Data Base Administration -11g", Release 2, 2012.
***, "SQL Language Reference-11g", Release 2, 2012.

SUBJECT : OBJECT-ORIENTED PROGRAMMING

NUMBER OF CREDIT POINTS: 6
SEMESTER: I
COURSE TYPE: core course

COURSE OBJECTIVES: This course studies the basic concepts concerning the object oriented programming using as examples the main features and the concepts of C++ language. Following are presented and analysed the syntactic details of C++ language.

COURSE CONTENT: the declaration and implementation of the classes, the using of the pointers and the references, the study of the constructor and the destructor functions, the overloading of the operators and of the functions, the inheritance mechanism and derivations of the classes, the design of the hierarchies of classes, virtual functions and the polymorphism, the stream system for the input-output operations in C++.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

Holzner, S., Borland C++ Programming, Brady Books, New York, 1992;
Ionita, A. D., Modelarea UML in ingineria sistemelor de programe, Ed. ALL, 2002;
Ionita, A. D., Saru.D., Sisteme de programe orientate pe obiecte, 328 pag. Ed. ALL, 2000;
Jamsa, K., Klander, L., Totul despre C si C++, Ed. Teora, 2000;
Oprea, M., Programare orientata pe obiecte. Exemple in limbajul C++, Ed. Matrixrom, 2004;
Prata, S., Manual de programare in C++, Ed. Teora, 2001;
Popa, I., Inginerie software pentru conducerea proceselor industriale, Ed. ALL, 2001;
Schild, H., Using Turbo C, Borland, Osborne / McGraw Hill, 1988;
Schild, H., Manual complet C++, Ed. Teora, 2003;
Somnea, D., Turturea, D., Introducere in C++, Programarea orientata pe obiecte, Ed. Tehnica, Bucuresti, 1993.

SUBJECT : MARKETING

NUMBER OF CREDIT POINTS: 2
SEMESTER: I
COURSE TYPE: complementary
COURSE OBJECTIVES: introducing the basic notions of marketing (market evolution, product policies, promotional activities, price setting, product distribution (emphasizing the IT).
COURSE CONTENT: The concept of Marketing; market research and market strategy; product policy; promotional policy; price policy; distribution policy.
TEACHING LANGUAGE: Romanian
EVALUATION: oral examination
BIBLIOGRAPHY:

Belch, G.E., Belch, M.A., "Introduction to Advertising & Promotion: An Integrated Marketing Communications Perspective", Richard Irwin, 1993;
Berkowitz, E., Kerin R., Rudelius W., "Marketing", 2nd Edition, Homewood, Illinois: Richard D. Irwin, 1989;
Berndt, R., Hermanns, A., "Handbuch Marketing-Kommunikation", Wiesbaden, 1993;
Kotler, P., Armstrong, G., "Principles of marketing", 650 pag., Pearson Education , Inc., Upper Saddle River, New Jersey, Prentice Hall, ISBN: 0-13-041814-5, 2004;
Kotler, P., Armstrong, G., Saunders, J., Wong, V., "Principiile marketingului" – ediţie europeană, 1136 pag., Editura Teora, Bucureşti, ISBN: 973-601-399-5, 1999;
Kotler, P., "Managementul marketingului", 1112 pag., Editura Teora, Bucureşti, ISBN: 973-20-0579-3, 2003;
Leihs, H., "Marketing", Wirtschaftsförderungsinstitut der Wirtschaftskammer, Wien, 1993;
Lendrevie J., Lindon D., "Mercator théorie et pratique du marketing", 4 ed., Dalloz, Paris, 1993;
McCarthy, J., Perreault, W.D., "Basic Marketing: A Managerial Approach", Ninth Edition, Homewood, Illinois: Richard D. Irwin, 1987;
Stanton, W. J., Etzel, M.J., Walker, B.J., "Fundamentals of marketing", 9th ed., New York (St. Louis, San Francisco) McGraw-Hill Book Company, 1991;
Wells, W., Burnett, J., "Advertising: principles and practice", Englewood Cliffs, NJ: Prentice Hall, 1995;
Colectia "Journal of Marketing", 2000-2007, Publication Group of American Marketing Association, ISSN: 0022-2429, 2008;
Colectia revistei "Enterprise Europa", 2003-2007, Getty images and the European Communities, ISSN: 1680-0516, 2007;
Colectia revistei "Marketing News", 2006, Thomson Business Intelligence Services, 2006;
Colectia revistei "The Marketier", 2006, FRANKLIN business management Frontier Advertising, ISSN: 1842-0443, 2007.

SUBJECT : ENGLISH

NUMBER OF CREDIT POINTS: 2
SEMESTER: **I, II**
COURSE TYPE: complementary
COURSE OBJECTIVES: Informaţie lipsă
COURSE CONTENT: Informaţie lipsă
TEACHING LANGUAGE: English
EVALUARE: oral examination
BIBLIOGRAPHY: Informaţie lipsă

SUBJECT : DIGITAL ELECTRONICS

NUMBER OF CREDIT POINTS: 3
SEMESTER: II
COURSE TYPE: core course
COURSE OBJECTIVES: presenting, analysing and using numeric integrated systems. It offers support in orders to completely and correctly design a numeric system concerning the electric interface, static and transitory regime parametres, the use of high speed circuits and the electromagnetic compatibility of numeric systems.
COURSE CONTENT: Introductory notions; families of numeric integrated circuits made using bipolar technology; numeric integrated circuits made using unipolar technology ; Interface circuits; bistable basculating circuits; semiconductor memory and programmable logic areas;

electromagnetic compatibility in design using numeric integrated circuits; transmission lines and interconnecting high speed numeric integrated circuits.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

Nicola, S., Circuite Integrate Numerice, partea I , Reprografia Universităţii din Craiova, 2000;
Nicola, S., Circuite Integrate Numerice. Aplicaţii în mecatronică, Ed.Universitaria , Craiova, 2005;
Wakerly, J. F., Circuite digitale; Principiile şi practicile folosite în proiectare, Editura Teora, 2002;
Rabaey, J.M., Digital Integrated Circuits - A Design Perspective, Prentice Hall, 1996;
Hodges, D., Jackson, H.G., Analysis and Design of Digital Integrated Circuits, McGraw Hill, 2nd ed., 1988.

SUBJECT : JAVA PROGRAMMING

NUMBER OF CREDIT POINTS: 3
SEMESTER: II
COURSE TYPE: core course
COURSE OBJECTIVES : This course will introduce students to fundamental concepts in developing JAVA computer application.
COURSE CONTENT: Students will learn the object-oriented paradigm, programming concepts, the basics of the Java computer language, and how to use the Eclipse integrated development environment. Each student will independently develop increasingly complex applications using the Java language. Students will learn how to create and use objects, and how objects communicate with each other (by sending messages) to accomplish business processes. Students will study and apply concepts that relate to program quality including: program readability, style, testing, and documentation. Java si Web. Applets; Java Software Development Kit (SDK) and applications; Classes, interfaces, Java packages; Individual and parallel executions; 2D graphics and graphic processing; interfaces GUI user- concept and design.
TEACHING LANGUAGE: Romanian
EVALUATION: written examinationination
BIBLIOGRAPHY:

Thinking in Java, ed.3 rev.4 – Bruce Eckel – ISBN 9780131872486, Editura: Prentice Hall PTR
JAVA : 1001 secrete pentru programatori / Mark C. Chan, Steven W. Griffith, Anthony F., Editura Teora, ISBN 973-20-0169-0
JAVA, ghid practic pentru programatori avansati - Joshua Bloch, Editura Teora, ISBN: 973-20-0406-1
Servicii WEB cu Java. XML, SOAP, WSDL si UDDI - Steve Graham, Editura Teora, ISBN 973-20-0470-3
The JAVATM Tutorial, A Practical Guide for Programmers, www.java.sun.com
Jaworski J., - JAVA 1.2 Unleashed, Macmillan Computer Publishng, ISBN: 1-57521-389-3, 1998,
Jaworski J., - JAVA Developer's Guide, Sams.net Publishing, ISBN: 1-5721-069-x, 1996

SUBJECT : MECHATRONIC SYSTEMS BASES

NUMBER OF CREDIT POINTS: 5
SEMESTER: II
COURSE TYPE: core course
COURSE OBJECTIVES: creating a set of competences absolutely necessary to approach the domain of mechatronics, establishing the connections with the other subject matters belonging to the domain.
COURSE CONTENT: Introductory aspects; the general structure of mechatronic systems; mechatronic systems – components, functional, construcitve and technological aspects. The representation of mechatronic systems functioning.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

Niţulescu, M., Bazele sistemelor mecatronice, Note de curs, 2008.
Histand M., Alciatore, D., Handbook of industrial robotics, McGraw-Hill, 1999.
Bishop, IR, The mechatronics handbook, CRC Press LLC, 2002.
Sandler, B., Robotics, designing the mechanisms for automated machinery, Prentice Hall Int. Inc., 1991.
Klafter, R., Chmielewski, T., Robotic engineering, an integrated approach, Prentice Hall, 1989.
David, R., Alla, H., Du Grafcet aux Reseau de Petri, HERMES Paris, 1989.
Bouteille, N., Le Grafcet, Cepadues Edition, 1992
***, AUTOMGEN şi AUTOSIM, Materiale de firmă.

SUBJECT : ROBOTICS BASES

NUMBER OF CREDIT POINTS: 5
SEMESTER: II
COURSE TYPE: core course
COURSE OBJECTIVES: introducing the basic concepts about the robot as a system (structure, operating systems, sensory systems, elemnts of movement transmission), kinematic and dynamic modeling, operating space analysis, mobile robots, conventional systems of control.
COURSE CONTENT: Introducing the issues of control systems in robotics; geometric and kinematic models; robots within the operating space; particular problems in operating robots; dynamic moels; mobile robots; operating systems and sensory systems in robotics; mmovement adjustment systems; control systems using state variables.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

Dwivedi, N.S., Robotics and Factories of the Future, Proc. Of an International Conf., Charlotte, U.S.A., December 1948, Springer Velag, 1948;
Renaud, M., Geometric and Kinematic Modeless of a Robot Manipulator, The 11th I.S.I.R., Tokyo, Japan, October 7/9, 1981;
x x x, Inteligenţă artificială şi Robotică, Ed. Academiei R.S.R., Bucureşti, 1983;
Lamineur, P., Cornille, O., Industrial Robots, Pergamin Press, 1984.;
Coiffet, Ph., Modeling and Control, Robot Technology, Hermes Publishing, 1983;
Ispas, V., Pop, I., Bocu, M., Roboţi industriali, Ed. Dacia, Cluj-Napoca, 1985.

SUBJECT : COMPUTER ARCHITECTURE

NUMBER OF CREDIT POINTS: 5
SEMESTER: II
COURSE TYPE: core course
COURSE OBJECTIVES: Understanding the way a computer works as a system, beyond programme operating, peripherics use and the software and hardware technology. Understanding the way data and programmes are encoded and manipulated within a calculus system, and also the main ways of programme execution.

COURSE CONTENT: Data storage; codes used to store information; communication errors; data manipulation; calculus architecture; communication computer - peripheric devices; programme execution; an example of assembly language; communication mains in calculus systems; microarchitectures.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:
J. Glen Brookshear - Introducere în informatică;
Andrew S. Tanenbaum - Structured Computer Organization;
Richard Y. Kain - Advanced Computer Architecture;
Sajjan G. Shiva - Computer Design and Architecture;
William Stallings - Computer Organization and Architecture;
Barry Wilkinson - Computer Architecture;
William Buchanan - Advanced PC Architecture.

SUBJECT : COGNITIVE PSYCHOLOGY

NUMBER OF CREDIT POINTS: 2
SEMESTER: II
COURSE TYPE: complementary
COURSE OBJECTIVES: Introducing knowledge about cognitive psychology understood as a detailed study of human cognitive system and of its subsystems, of the specific language and methodology, about the cognitive approach of one's personallity correlated to one's psycho-social environment. The latter refers to a broader way of rethinking the new concepts and of integrating some already known psychological theories by the students.
COURSE CONTENT: Cognitive sciences and cognitive psychology; human psychic as an informational system; primary and secondary processing of information; attention; learning and memory neurobiology; language mechanisms; categorization as an operation of integrating information conceptually; human cognitive system architecture; personality and its neuro-physiological bases; the operational structure of behaviour.
TEACHING LANGUAGE: Romanian
EVALUATION: oral examination
BIBLIOGRAPHY:
Arseni, G., Golu, M., Dănăilă, L., 1983, Psihoneurologie, Bucureşti, Ed. Academiei;
Anderson, J.R., 1983, The Arhitecture of Cognition, Cambridge, M.A.;
Botez, M.I., (red). 1986, Neurologie clinică şi neurologia comportamentului, Bucureşti, Editura Medicală;
Delacour, J., 2001, Introducere în neuroştiinţele cognitive, Iaşi, Ed. Polirom;
Gazzaniga, M. S., (ed.), 1995, The cognitive neurosciences, Cambridge, MA: MIT Press;
Golu, M., 2000, Fundamentele psihologiei, vol. I-II, Bucureşti, Editura Fundaţia "România de mâine";
Miclea M., 1999, Psihologie cognitivă. Modele teoretico-experimentale, Iaşi, Ed. Polirom;
Novac, C., 2006, Caracteristici tipologice ale personalităţii pe fondul asimetriei funcţionale cerebrale, Craiova, Editura Universitaria;
Solso, R. L., (ed.), 1997, Mind and brain sciences in the 21stcentury, Cambridge, MA: MIT Press;
Zlate, M.,(coord.), 1999, Psihologia mecanismelor cognitive, Iaşi, Ed. Polirom.

SUBJECT : INTERNSHIP I

NUMBER OF CREDIT POINTS: 5
SEMESTER: II
COURSE TYPE: core course
COURSE OBJECTIVES: preparing the future engineers specialise din Mechatronics and Robotics. There are envisaged notions concerning mechatronic systems as a whole, rapid scale prototype making, configurable systems, notions of mechanisms and robotics, electronics, sensors and actuators, programming, control and rapid prototyping of control. Each of these concepts is examplified in one or more applications. The practical support is ensured by LEGO Mindstorms NXT teaching set.
COURSE CONTENT: Making a robot using Lego components and following the next three steps: robot building: building a mobile mechatronic platform with wheels; building a biped mobile mechatronic platform; robot programming using NXT-G graphic programming medium; testing the programme. Because of the flexibility of Lego pieces, a large number of structures can be built.
TEACHING LANGUAGE: Romanian
EVALUATION: oral examination
BIBLIOGRAPHY:
Kit-uleducaţional LEGO Mindstorms NXT

3-RD YEAR

SUBJECT: OPERATING MECHANISMS AND MICROSYSTEMS

NUMBER OF CREDIT POINTS: 4
SEMESTER: I
COURSE TYPE: core course
COURSE OBJECTIVES: developing an application focused on an overall view on intelligent materials and structures.
COURSE CONTENT: Mechanisms structure; kinematic coupling; kinematic chain; mechanism; plane kinematic groups; defining intelligent materials; Bingham's plastic model for fluids flow; the macroscopic modeling of ERF behaviour; ERF types; adaptive structures with E.R. materials; ER valves actuators; ER. Cilindric valves; SMA operating principle; SMA modeling; aspects regarding the optimal design of SMA actuators for microgrippers.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

Cretu N. Simona-Mariana, Applications of TRIZ to Mechanisms & Bionics, Ed. Academica, Greifswald, 2007;

Cretu N. Simona-Mariana, Mecanisme plane si spatiale, Ed. Sitech, Craiova, 2000.

SUBJECT : AUTOMATA AND MICROPROGRAMMING

NUMBER OF CREDIT POINTS: 5
SEMESTER: I
COURSE TYPE: core course
COURSE OBJECTIVES: introducing the basic concepts concerning programmable automata and microprogramming systems. There are presented modern methods of design and the newest systems used in industrial implementation.
COURSE CONTENT: synchronous automata analysis and synthesis; automata design using cabled logic and flexible logic; microprogrammed structures; principles; microprogrammed automata architectures; scalar and vectorial microprogrammable automata; programmable logic controllers; industrial robots control using CLP-uri.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

Implementarea organigramelor de stări utilizând automatele programabile cu memorii ROM în configuraţia I, II, III şi IV

Givone, D.D., Roesse, R.O., Microprocessors / Microcomputers: An Introduction, Me Graw-Hill Book Company, 1980

Popescu, D., Automate programabile, Ed. Sitech, Craiova

Căpăţână, O., Haşeagan, M.C., Puşcă, M., Proiectarea cu microporcesoare, Ed. Dacia, Cluj – Napoca, 1983

Klingman, B.E., Microprocessor Systems Design, Prentice Hall, 1977

Dollhoff, T., 16-Bit Microprocessor Arhitecture, Reston Publishing Co., 1979

Borangiu, Th., Dobrescu, R., Automate programabile, Ed. Academiei R.S.R., Bucureşti, 1986

7. Lupu, C., Ţepelea, V., Purice, E., Microprocesoare – aplicaţi, Ed. Militară, Bucureşti, 1982

Davis, W., Experimentation with microprocessor applications, Reston Publishing Co., 1981

Sprînceană, N., Dobrescu, R., Borangiu, Th., Automatizări discrete în industrie. Culegere de probleme, Ed. Tehnică, Bucureşti, 1978

SUBJECT: INTELLIGENT MATERIALS AND STRUCTURES

NUMBER OF CREDIT POINTS: 5
SEMESTER: I
COURSE TYPE: core course

COURSE OBJECTIVES: introducing the basic concepts referring to intelligent materials and structures and applying them in engineering , art and medicine. Theoretical aspects are accompanied by case study for the most important applications of intelligent fluids and materials having shape memory.

COURSE CONTENT: Introduction. Intelligent materials and structures; electrorheological and magnetorheological liquids; materials with shape memory.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

Budau V., Crăciunescu C. M., Un material în pragul secolului XXI. Aliajele cu memorie a formei, Editura Orizonturi, Timişoara, 1994.

Gilbertson Roger G., Muscle wires, Mondotronics, USA, 1994

Gillet H., Patoor E., Berveiller M., Mechanical engineering for shape memory alloys, ICOMAT 92, Monterey Ca, Juillet 1992.

Stoeckel D., Shape Memory Actuators for Automotive Application, p. 283 in "Engineering Aspects of Shape Memory Alloys", Edited by T. W. Duerig et al, Butterworth-Heinemann Ltd., England, 1990.

Furuya Y., Simada H., Shape Memory Actuators for Robotic Applications, p. 338 in "Engineering Aspects of Shape Memory Alloys", Edited by T. W. Duerig et al, Butterworth-Heinemann Ltd., England, 1990.

Waram T. C., Actuator Design Using Shape Memory Alloys, Ontario, Canada, 1993

Bîzdoacă N., I. Diaconu - Magnetorheological (MR) Fluids. Basic Mathematical Models For MR Applications – 39 Week of the Syrian Science – 6-11 Nov.1999-Damascus

Brooks, D.A., - Electro-Rheological Device, CME September, pp. 91-93,1982

Rabinow J. - The Magnetic Fluid Clutch, AIEE Transaction, 67(1948), 1308-1315

Duclas T.G. - An Externally Tunable Hydraulic Mount Which Uses Electrorheological Fluid, Soc. Automotive Engineers, SAE Paper #870963 (1987)

Dyke, S.J., Spencer, B.F.jr., Sain, M.K. and Carson, J.D. – An experimental study of MR dampers for seismic protection, Smart Mater. Struct., 7, 1998, 693-703

MSC Software Documentation – Adams, http://www.mscsoftware.com.

SUBJECT : ROBOT CONTROL SYSTEMS

NUMBER OF CREDIT POINTS: 5
SEMESTER: I
COURSE TYPE: core course
COURSE OBJECTIVES: The course presents theoretical and practical aspects concerning the control systems design for robotic structures, and also the structure and operating of evaluated robotic systems meant for industry.
COURSE CONTENT: The synthesis of control shema for manipulators and robots; ABB IRB 1400: the general aspects, basic operations, robot trajectory control.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination

BIBLIOGRAPHY:

Mair, M. G., Industrial robotics, Prentice Hall International Inc. 1988

Nof, Y. S., Handbook of industrial robotics, Krieger Publishing Company, 1992

Warnock, I., Programmable controllers, operation and application, Prentice Hall International Inc., 1988

Sandler, B., Robotics, designing the mechanisms for automated machinery, Prentice Hall International Inc., 1991

Klafter, R., Chmielewski, T., Robotic engineering, an integrated approach, Prentice Hall, 1989

Ivănescu, M., Roboţi industriali, Ed. Universitaria Craiova, 1994

Ivănescu, M. – Sisteme avansate de conducere în robotică, Ed. Scrisul Romanesc, 2003

Ivănescu, M., Niţulescu M., s.a.,Sisteme neconvenţionale pentru conducerea roboţilor, Ed. Universitaria Craiova, 2003

Niţulescu M., Automatul programabil FA 1J; Funcţionare, instrucţiuni şi aplicaţii, Reprografia Universităţii din Craiova, 1993

Niţulescu, M., Sisteme robotice educationale, Sitech, 1999

Ivănescu, M., Niţulescu, M., Robotica I, Indrumar de laborator, Reprografia Universităţii din Craiova, 1993

***, Materiale de firmă pentru roboţii existenţi în dotare

SUBJECT : MEASUREMENTS AND TRADUCTORS

NUMBER OF CREDIT POINTS: 4

SEMESTER: I

COURSE TYPE: core course

COURSE OBJECTIVES: Acquiring the basic knowledge about measurement systems (structure, specific electronic blocks, performance), the structure and functioning of electronic measurement and visualisation apparata, general characteristics, functioning principles and sensors and traductors applications.

COURSE CONTENT: Introduction; electronic circuits specific to measurement systems; electronic apparata for measurement and visualisation; sensors and traductors; multisensory systems.

TEACHING LANGUAGE: Romanian

EVALUATION: oral examination

BIBLIOGRAPHY:

Purcaru D., Măsurări electronice, Editura Universitaria, Craiova, 2004;

Purcaru D.M., Senzori şi traductoare. Vol. I, Editura Reprograph, Craiova, 2001;

Purcaru D., Măsurări şi traductoare. Suport electronic pentru curs, seminar şi laborator (electronics.ucv.ro/dpurcaru), 2007;

Ionescu G., ş.a, Traductoare pentru automatizări industriale. Vol. I şi II, Editura Tehnică, Bucureşti, 1985, 1996;

Ţăţulescu M., Instrumentaţie şi tehnici electrice de măsurare, Reprografia Universităţii din Craiova, 1997;

Hesse, J, Garden, J. W., Sensors in Manufacturing, vol. I, II, Ed. Willy – VCH, Verlag GmbH, 2001;

Vremera E., Masurari electrice si electronice, vol I si II, Ed. MATRIX ROM, Bucuresti, 2002;

Sinclair, I., Sensors and Transducers. Third edition, Newness, 2001;

Jurcă T., Stoiciu D., Instrumentaţie de măsurare. Structuri şi circuite, Editura de Vest, Timişoara, 1996;

Foile de catalog ale senzorilor, traductoarelor, circuitelor sau modulelor electronice şi aparatelor prezentate la curs, seminar şi laborator.

SUBJECT: MICROCONTROLLERS AND MICROPROCESSORS

NUMBER OF CREDIT POINTS: 3

SEMESTER: I

COURSE TYPE: core course

COURSE OBJECTIVES: Knowing the architecture and functioning of some 16/32 bite processors, focusing on Intel 80x86 family. Knowing a modern PC/controller architecture, the system mains PC-104/ISA and PC-104+/PCI and the interfaces for those. Knowing the architecture and specific peripheral resources for representative families of 8 and 16 bite microcontrollers, their software and hardware used to develop a microcontroller application. It is important to develop the capacity of choosing a microcontroller for a specific application (calculus power, resources, etc).

COURSE CONTENT: Introduction to Intel 80x86 architecture; Execution of instructions 80x86; System architectures; System mains: PC-104 and ISA; PC-104+ and PCI; AVR (Atmel) family; 16LX (Fujitsu Microelectronics) family.

TEACHING LANGUAGE: Romanian

EVALUATION: written examination

BIBLIOGRAPHY:

Nicola, S. Microcontrolere. Aplicaţii in mecatronica, Ed. Universitaria Craiova, 2005;

Popa, M. Microprocesoare si microcontrolere, Editura Politehnica Timişoara, 1997;

Athanasiu, I, A. Panoiu, A. Microprocesoarele 8086, 286, 386, Editura Teora, Bucureşti 1993;

Kuhnel, K., AVR RISC Microcontroller Handbook, Butterworth-Heinemann, 1998;

Barnett., Cox., O'Cull, Embedded C Programming and the Atmel AVR, Thomson Delmar Learning, 2001.

SUBJECT : FLUIDS SYSTEMS IN ROBOTICS

NUMBER OF CREDIT POINTS: 2

SEMESTER: I

COURSE TYPE: core course

COURSE OBJECTIVES: preparing the future specialists in the domain of process control and technical informatics. There are presented the basic knowledge in the domain of hydraulic and pneumatic automation equipment, and also the techniques of fluids systems control.

COURSE CONTENT: General considerations. Fluids properties. Basic laws of fluids. Fluids flowing. Hydraulic operating. Pneumatic and electropneumatic automation elements.

TEACHING LANGUAGE: Romanian

EVALUATION: oral examination

BIBLIOGRAPHY:

E. Lewis, H. Stern, Sisteme automate hidraulice, Ed. Tehnică, Bucureşti 1968.

A. Oprean, V. Marin, Acţionări hidraulice, Ed. Tehnică, Bucureşti 1976.

V. Marin, R. Moscovici, D. Teneslav, Sisteme hidraulice de acţionare şi reglare automată. Ed. Tehnică, Bucureşti 1981.

V. Oprean, Fl. Ionescu, Al. Dorin, Acţionări hidraulice. Elemente şi sisteme, Ed. Tehnică, Bucureşti 1982.

Julieta Florea, I. Seteanu, Gh. Zidaru, V. Panaitescu, Mecanica fluidelor şi maşini hidropneumatice. Probleme, Ed. D.P., Bucureşti 1982.

D. Ionescu, P. Matei, V. Ancuţa, M. Buculei, Mecanica fluidelor şi maşini hidraulice, Ed. D. P., Bucureşti 1983.

D. Nicolae, R. Lungu, E. Bobaşu, Echipamente hidraulice şi pneumatice. Îndrumar de laborator, Reprografia Universităţii din Craiova 1984.
V. Ispas, I. Pop, M. Bocu, Roboţi industriali, Ed. Dacia, Cluj - Napoca 1985.
V. Marin, A. Marin, Sisteme hidraulice automate. Construcţie, reglare, exploatare, Ed. Tehnică, Bucureşti 1989.
M. Guillon, L'asservissement hydraulique et électrohydraulique, Dunod - Paris, 1972.
S. Scavarda, Les asservissements électropneumatiques de position, Hermes - Paris,1989.
E. Bobaşu, Ehipamente fluidice pentru sisteme automate, curs, Reprografia universităţii din Craiova, 1997.

SUBJECT : MECHATRONICS

NUMBER OF CREDIT POINTS: 2
SEMESTER: II
COURSE TYPE: core course
COURSE OBJECTIVES: introducing the basic concepts concerning the problems of robotic structures design and control.
COURSE CONTENT: Introduction to robotics; robotic structures; principles of designing and manufacturing manipulators and robots; special functions of manipulators and robots; manipulators and robots control by means of programmable automata; interfacing robots in industry; interconnecting robots; their choice, installing and operating.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

Mair, M. G., Industrial robotics, Prentice Hall International Inc. 1998.
Nof, Y. S., Handbook of industrial robotics, Krieger Publishing Company, 2002.
Warnock, I., Programmable controllers, operation and application, Prentice Hall International Inc., 1998.
Sandler, B., Robotics, designing the mechanisms for automated machinery, Prentice Hall International Inc., 1999.
Klafter, R., Chmielewski, T., Robotic engineering, an integrated approach, Prentice Hall, 1999.
Ivănescu, M., Industrial Robots, Ed. Universitaria Craiova, 1994.
Ivănescu, M., Advanced Control Systems for Robots, Ed. Scrisul Romanesc, 2003.
Ivănescu, M., Niţulescu M., s.a., Unconventional Systems for Robots Control, Ed. Universitaria Craiova, 2003.
Popescu D., Programmable logic controllers, Ed. Universitaria Craiova, 2010.
Niţulescu, M., Educational Robotic Systems, Ed. Sitech, 1999.
Renaud, M., Geometric and Kinematic Modeless of a Robot Manipulator, The 11th I.S.I.R., Tokyo, Japan, 1991.
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Coiffet, Ph., Modeling and Control, Robot Technology, Hermes Publishing, 1983.
Bogdanov I., Robots Control, Ed. Orizonturi Universitare Timisoara, 2009.
Hackworth J.R., Hackworth F.D. Jr., Programmable logic controllers, Ed. Pearson Education, 2004.
Morgan S., Programming Microsoft Robotics Studio, Microsoft Press, 2008.
Alciatore D., Histand M., Introduction to Mechatronics and Measurement Systems, Ed. McGraw-Hill, 2007.
McComb G., Predko M., Robot Buider's Bonanza, Ed. McGraw-Hill, 2006.
Festo – Manual for the electronics nad mechatronics industry, Theory and Practice, 2008.
Pashkov E., osinskiy Y., Chetviorkin A., Electropneumatics in Manufacturing Processes, 2004.
Clarence W. De Silva, Mechatronics – An Integrated Approach, CRC Press, 2005.

SUBJECT : APPLICATIONS OF ROBOTIC SYSTEMS

NUMBER OF CREDIT POINTS:2
SEMESTER: II
COURSE TYPE: specialty
COURSE OBJECTIVES: Acquiring the knowledge about the industrial and non-industrial applications of robots within automated processes, focusing on the physical structure and architecture of the installations, on models and control systems.
COURSE CONTENT: Industrial applications. Processes and technologies, physical structures, models, control systems. Non-industrial applications, specific problems, physical structures, models, control systems**.**
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

Ivănescu, M., "Sisteme Avansate de Conducere in Robotica", Ed. Scrisul Romanesc, Craiova, 2003, ISBN: 973-38-0389-8;
Ivănescu M., Niţulescu, M., Stoian, V., Bîzdoacă, N., "Sisteme neconvenţionale pentru conducerea roboţilor", Ed. Universitaria, Craiova, 2002, ISBN: 973-8043-147-X;
Jazar, R.N., "Theory of Applied Robotics: Kinematics, Dynamics, and Control", Springer Science, LLC, New York, NY 10013, USA, 2007, ISBN: 978-0-387-32475-3;
Kawamura Sadao, Svinin Mikhail (Eds.), Advances in Robot Control, Ed.: Springer, New York, USA, 2006, ISBN: 978-3-540-37346-9;
Klafter, R.D., "Robotic engineering: An Integrated Approach", Prentice-Hall, New Jersey, USA, 1989;
Kozlowski, K., (Ed.), "Robot Motion and Control", Series: Lecture Notes in Control and Information Sciences, Vol. 335, 2006, ISBN: 978-1-84628-404-5;
Schilling, J.R.,"Fundamentals of Robotics: Analysis and Control", Prentice Hall, 1990;
Sponghttp://www.amazon.com/Robot-Modeling-Control-Mark-Spong/dp/0471649902/ref=pd_bxgy_b_text_c - # , M.W., Hutchinson, S., Vidyasagar, M.," Robot Modeling and Control", Ed.: Wiley, New York, USA, 2005, ISBN: 978-0471649908;
Stoian, V.,"Roboţi industriali. Aplicaţii-vol I", Ed. Universitaria, Craiova, 2003, ISBN:973-8043-158-8;
Stoian, V.,"Roboţi industriali. Aplicaţii-vol II", Ed. Universitaria, Craiova,2006, ISBN:973-8043-497-7;
***, Welding Design & Fabrication, USA, dec.1995, pp. 14-15;
***, IEEE Robotics & Automation Magazine, vol. 15, No. 1, March 2008, ISSN: 1070-9932.

SUBJECT : ADJUSTMENT ENGINEERING

NUMBER OF CREDIT POINTS: 4
SEMESTER: II
COURSE TYPE: specialty
COURSE OBJECTIVES: presenting the fundamental problems of continual and discrete automated adjustment systems**.** There are presented theoretical and practical

methods concerning the analysis, design and implementation of adjustment systems.
COURSE CONTENT: The general structure of a control system; conventional adjustment systems; automated control systems symbolising; typicalised laws of continual linear adjustment; analysis example staritng from an automation schema: the adjustment system of a fluid flow; quality indexes and performance imposed on automated adjustment systems; unconventional structures of automated adjustment; automation equipment functions; classification of automation equipment; unified signals with automation equipment; Structures of making an industrial regulator; general aspects on adjustment laws making; making continual linear adjustment laws by means of operational amplifiers; automation problem formulation; the analysis of adjustment systems in stationary regime; the synthesis of continual automated adjustment systems; the synthesis of discrete automated adjustment systems in time; stochastic systems of automated adjustment; adaptive systems of automated adjustment; fuzzy systems.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

Marin, C., Structuri şi legi de reglare automată, Editura Universitaria Craiova, ISBN: 973-8043-96-8, 2000, Craiova, 2000;
Marin, C., Sisteme neconvenţionale de reglare automată, Editura SITECH Craiova, 2004, ISBN 973-657-793-7, Craiova, 2004;
Marin, C., Ingineria reglării automate-Elemente de analiză şi sinteză, Editura SITECH Craiova, 2004, ISBN 973-657-765-1, Craiova, 2004;
Marin, C., Petre, E., Popescu, D., C. Ionete, D. Selişteanu, Sisteme de reglare automată, Lucrări practice II, ISBN:973-9346-09-4, Editura SITECH Craiova, 1998, Craiova, 1998;
Marin, C., Petre, E., Popescu, D., Ionete, C., Selişteanu,D., Sisteme de reglare automată, Lucrări practice I, ISBN: 973-9346-09-4, Editura SITECH Craiova, 1997, Craiova, 1997.

SUBJECT : DATA TRANSMISSION

NUMBER OF CREDIT POINTS: 5
SEMESTER: II
COURSE TYPE: specialty
COURSE OBJECTIVES: preparing the future engineers by ensuring their knowledge about information transmission theory, and the design and realization of data transmission systems.
COURSE CONTENT: Introduction to information transmission; communication channels; signals used in data transmission; data transmission using a sinusoidal carrier; numeric data transmission; error control in data transmission; data compression; data transmission systems in process control.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

Carbon M., Exercices résolus de mathématiques du signal, Ed. Dunod Paris 1992;
Cullman G., Coduri detectoare si corectoare de erori, Ed. Tehnica Bucuresti 1972;
Dobrescu R., Transmiterea datelor, Editura Academiei Române, Bucuresti, 2005;
Duvant P., Traitement du signal, Ed. Hermes - 1990;
Feher K., Comunicatii digitale avansate, vol. I, Ed. Tehnica Bucuresti 1993;
Feher K., Comunicatii digitale avansate, vol. II, Ed. Tehnica Bucuresti 1994;
Held G., Data Compression. Techniques and Applications. Hardware and software, Ed. John Wiley&Sons 1985;
Held G., Comunicaţii de date, Editura Teora, Bucureşti, 1998;
Iancu E., Teoria transmisiei datelor, Editura Universitaria, Craiova, 2004;
Iancu E., Transmisii de date , îndrumar de laborator 1995, Reprografia Universităţii din Craiova;
Proakis J., Communication Systems Engineering, Prentice Hall International Editions, 1994;
Reinhard H., Cours de mathématiques du signal, Ed. Dunod Paris - 1992;
Spataru Al., Fondements de la théorie de la transmission de l'information, Presses Polytechniques Romandes, 1987;
Tugal D., Data Transmission. Analysis, Design, Application consideration , McGraw-Hill Book Company 1982.

SUBJECT : COMPUTER AIDED DESIGN

NUMBER OF CREDIT POINTS: 3
SEMESTER: II
COURSE TYPE: core course
COURSE OBJECTIVES: Understanding the environment specific to computer-aided design, beyond programme operating and peripherics use. The students will be able to program a parametrized application to be operated by a non-specialist beneficiary in using a computer-assisted design system.
COURSE CONTENT: Reviewing elements of AutoCAD design; elements of AutoLISP in AutoCAD environment; access to AutoCAD entities using AutoLISP; programming applications with parametres settled in computer aided dsign environment.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

Proiectare asistată - curs, Dorian Cojocaru, Cristian Vladu;
Proiectare asisatată de calculator, Dorian Cojocaru, Cristian Vladu – îndrumar de laborator;
Documentaţie de firmă AutoDESK, AutoCAD (Inventor, Electrical).

SUBJECT : INDUSTRIAL SOFTWARE

NUMBER OF CREDIT POINTS: 3
SEMESTER: II
COURSE TYPE: specialty
COURSE OBJECTIVES: introducing the basic notions of real-time management of industrial processes, and getting the students acquainted with the main specialised languages for industrial applications MATLAB/Simulink/RTW and LabVIEW and also the microcontroller embedded software.
COURSE CONTENT: Notions of continuous systems discretisation; simulating hybrid systems by using Simulink; Fourier analysis in real time; signal analysis in real time; applications to audio signals; developing applications in real time; creating executives directly from MATLAB; Real Time Workshop (RTW). General presentation; implementing Quanser real time experiments; implementing simple embedded applications in KEIL development system.
TEACHING LANGUAGE: Romanian
EVALUATION: oral examination
BIBLIOGRAPHY:

Ionete, C., Selişteanu, D., Echipamente de Automatizare şi Protecţie, Reprografia Universităţii din Craiova, 2000;
Marin, C., Popescu, D., Petre, E., Selişteanu, D., Ionete, C., Sisteme de Reglare Automată. Lucrări Practice I, Ed. Sitech, Craiova, 1997;
Nachtingal, Chester L. (ed.), Instrumentation and Control. Fundamentals and Applications, John Wiley & Sons, Inc., New York, 1990;
Selişteanu, D., Ionete, C., Petre, E., Popescu, D., Şendrescu, D., Ghid de programare în LabVIEW. Aplicaţii pentru prelucrarea semnalelor, Tipografia Univ. din Craiova, 2003;
Selişteanu, D., Ionete, C., Petre, E., Popescu, D., Şendrescu, D., Aplicaţii LabVIEW pentru achiziţia şi generarea datelor, Ed. Sitech, Craiova, 2004;
*** MATLAB/Simulink/RTW. User Guide;
*** LabVIEW User Guide;
Ionete C. Software Industrial. Note de curs;
***dSpace/TargetLink. User Guide.

SUBJECT : PROJECT MANAGEMENT

NUMBER OF CREDIT POINTS: 4

SEMESTER: II

COURSE TYPE: core course

COURSE OBJECTIVES: getting the students familiar with the aspects linked to the management and control of project-organised activities.

COURSE CONTENT: Introduction; the project life cycle; the project proposal; organisational alternatives in project management; the working environment of the project manager; his/ her role and responsibilities; project proposals analysis; conflict management; project team gathering; planning diagram network; software for project management.

TEACHING LANGUAGE: Romanian

EVALUATION: oral examination

BIBLIOGRAPHY:

Timothy. J. Havranec, "Modern Project Management Tehnique", St. Lucie Press, N.Y., 1999;
James S., Pennypacker, "Principles of Project Management", PMI-NC, 1999;
* * * PMBOK-PMI-NC, 1998;
* * * PMBOK-PMI-NC, 2000;
Maican C., Vinatoru M., Canureci G. “Managementul Proiectelor-Îndrumar de laborator”, EUC, 2006;
Carl S. Chatfield, PMP, Tim D. Johnson, MCP, “Microsoft Project 2000”;
Jack R. Meredith, Samuel J. Mantel. "Project Management : A Managerial Approach", 5th ed., Wiley, 2002;
Johnson, James. “The Chaos Report.” West Yarmouth, MA: The Standish Group, 2000;
Kan, Stephen H. "Metrics and Models in Software Quality Engineering" . 2nd ed. Boston, MA: Addison-Wesley Professional, 2002;
Lewis, James. " Fundamentals of Project Management", 2nd ed., American Management Association, 2002;
Radice, Ronald A. "High Quality, Low Cost Software Inspections" . Andover, MA: Paradoxicon Publishing, 2002;
Richard H. Thayer, Edward Yourdon. "Software Engineering Project Management", 2nd Ed., Wiley-IEEE Computer Society Press, 2000;
Rothman, Johanna. "Hiring Technical People". New York: Dorset House, 2003;
Scott Berkun. "Art of Project Management". Cambridge, MA: O'Reilly Media, 2005.

SUBJECT : INTERNSHIP 2

NUMBER OF CREDIT POINTS: 5

SEMESTER: II

COURSE TYPE: specialty

COURSE OBJECTIVES: specialising the future engineers in robotics and mechatronics, improving their technological knowledge. Internship is necessary to understand theoretical knowledge and to apply it.

COURSE CONTENT: The study of technological processes in food industry, energy industry, automotive industry, construction industry, etc. (Ford, Elpreco, Termo Işalniţa, Termo Rovinari, Termo Turceni, Fabrica de bere Craiova, Regia Autonomă Apele Române); Software and hardware systems use din automobile industry – real-time embedded control systems (Ford, Dacia-Renault Piteşti, Hella, Continental Sibiu, Siemens etc); industrial processes management (Dacia-Renault, Elpreco, Ford); automated adjustment systems for temperature, pressure, flow capacity, etc (Termo Işalniţa, Termo Rovinari, Termo Turceni); flexible manufacturing lines; construction and operating (Ford, Elpreco, Fabrica de bere Craiova); programmable automata. Programming, operating, industrila implementation (Fabrica de bere Craiova, Elpreco, Ford, Siemens, Continental Sibiu); Industrial robots: operating, programming, maintenance (Ford, Dacia-Renault); distributed systems of industrila processes control (Termo Işalniţa, Termo Rovinari, Termo Turceni, Ford); graphic interfaces, virtula instrumentation and acquisition systems use din process control (Procontrol, Labview etc). (Termo Işalniţa, Termo Rovinari, Termo Turceni, Dacia-Renault); networks of industrial computers (Ford, Dacia-Renault, Termo Işalniţa, Termo Rovinari, Termo Turceni etc.)**.**

TEACHING LANGUAGE: Romanian

EVALUATION: oral examination

BIBLIOGRAPHY:

Asch, G., Acquisition de données du capteur à l’ordinateur, Dunod, Paris, 1999;
Bentley, J.P., Principles of Measurements Systems, Longman Scientific & Technical, United Kingdom, 1988;
Cottet, F., Ciobanu, O., Bazele Programării în LabVIEW, MATRIX ROM, Bucureşti, 1998;
Golovanov, C., Albu, M. (coordonatori), Probleme moderne de măsurare în electroenergetică, Ed. Tehnică, Bucureşti, 2001;
Ionete, C., Selişteanu, D., Echipamente de Automatizare şi Protecţie, Reprografia Universităţii din Craiova, 2000;
Jurca, T., Stoiciu, D., Instrumentaţie de măsurare. Structuri şi circuite, Ed. de Vest, Timişoara, 1996;
McGhee, J., Kulesza, W., Henderson, I.A., Korczynski, M.J., Measurement Data Handling Theoretical Technique, Technical University of Lodz, ACGM. Lodart, Lodz, Polonia, 2001;
Nachtingal, Chester L. (ed.), Instrumentation and Control. Fundamentals and Applications, John Wiley & Sons, Inc., New York, 1990;
Oppenheim, A.V., Schafer, R.W., Discrete-Time Signal Processing, Second Edition, Prentice Hall International, 1999;
Porat, B., A Course in Digital Signal Processings, John Wiley & Sons, Inc., New York, 1997;
Selişteanu, D., Ionete C., Petre E., Popescu D., Şendrescu D., Aplicaţii LabVIEW pentru achiziţia şi generarea datelor, Editura SITECH, Craiova, 2004;
Selişteanu, D., Ionete, C., Petre, E., Popescu, D., Şendrescu, D., Ghid de programare în LabVIEW.

Aplicaţii pentru prelucrarea semnalelor, Tipografia Universităţii din Craiova, 2003;
Ştefănescu, S., Filtre, Ed. Tehnică, Bucureşti, 1987;
Tompkins, W.J., Webster, J.G.W. (editori), Interfacing Sensors to the IBM PC, Prentice Hall, SUA, 1988;
Ţăţulescu, M., Instrumentaţie şi tehnici electrice de măsurare, Reprografia Universităţii din Craiova, 1997;
*** AT-MIO-16 User Manual, National Instruments, SUA, 1995;
*** LabVIEW Data Acquisition Course Manual, National Instruments, SUA, 2001;
*** LabVIEW Measurements Manual, National Instruments, SUA, 2000;
*** LabVIEW User Guide, National Instruments, SUA, 1996;
*** NI-DAQ User Manual, National Instruments, SUA, 2001;
*** Product Data: Sensors – Thermocouples, Connectors and Platinum Resistance Thermometers, Eurotherm Controls Limited, Marea Britanie, 1994.

4-TH YEAR

SUBJECT : INTEGRATED SYSTEMS

NUMBER OF CREDIT POINTS: 5
SEMESTER: I
COURSE TYPE: specialty
COURSE OBJECTIVES: introducing basic notions concerning integrated systems principles, the systems with limited calculus and communication resources; getting the students familiar with real-time industrial systems which are control network distributed and microcontroller-based.
COURSE CONTENT: Integrated systems architecture; the general architecture of microcontrollers; real-time operating systems for integrated systems; the interfacing between integrated systems and external processes; communication with the exterior.
TEACHING LANGUAGE: Romanian
EVALUARE: oral examination
BIBLIOGRAPHY:

Iancu, E., Transmisia Datelor, Ed. Reduta, Craiova, 1998;
Ionete, C., Selişteanu, D., Echipamente de Automatizare şi Protecţie, Reprografia Universităţii din Craiova, 2000;
Marin, C., Popescu, D., Petre, E., Selişteanu, D., Ionete, C., Sisteme de Reglare Automată. Lucrări Practice I, Ed. Sitech, Craiova, 1997;
Selişteanu, D., Ionete, C., Petre, E., Popescu, D., Şendrescu, D., Ghid de programare în LabVIEW. Aplicaţii pentru prelucrarea semnalelor, Tipografia Univ. din Craiova, 2003;
Selişteanu, D., Ionete, C., Petre, E., Popescu, D., Şendrescu, D., Aplicaţii LabVIEW pentru achiziţia şi generarea datelor, Ed. Sitech, Craiova, 2004;
Documentatie tehnica Keil;
Documentatie tehnica Atmel 80C251G2D**.**

SUBJECT : MECHATRONICS SYSTEMS DYNAMICS

NUMBER OF CREDIT POINTS: 4
SEMESTER: I
COURSE TYPE: core course
COURSE OBJECTIVES: to make the students acquire the theoretical knowledge and develop competences in creating dynamic models of mechatronic systems by using various methods.
COURSE CONTENT: Basic laws in physics which are the fundamental elements in dynamic modeling of systems; mechatronic systems modeling; weight centers, inertia moments, mechanical work, impulse. Kinetic and potential energy. Dynamic modeling of mechatronic systems using Lagrange method. Dynamic modeling of mechatronic systems using Newton-Euler method. Dynamic modeling of mechatronic systems using D'Alembert method. Dynamic modeling of mechatronic systems using Kane method.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

Bishop, R.H., (Editor-in-Chief), "The Mechatronics Handbook", CRC Press LLC, New York, 2002.
Chirikjian, G.S., Burdick, J.W., "Theory and Applications of Hyper-Redundant Robotic Mechanisms", Eighth World Congress on the Theory of Machines and Mechanisms, Prague, Czechoslovakia, August 26-31, 1991, vol. 1, pp. 429-432.
Davidoviciu, A., s.a., "Modelarea, simularea şi comanda manipulatoarelor şi roboţilor industriali", Editura Tehnică, Bucureşti, 1986.
Hale J.K., Lasalle J.P., "Differential equations and dynamical systems", Academic Press, 1967.
Hirose, S., "Biologically Inspired Robots Snake-Like Locomotors and Manipulators", Oxford University Press, 1993.
Ivănescu M., "Dynamic Control for a Tentacle Manipulator", Proc. Int. Conf. on Robotics and Factories of the Future, pp. 315-327, Charlotte, USA, 1984.
Ivănescu, M., From Classical to Modern Mechanical Engineering-Fundamentals, Ed. Academia Română, Bucharest, 2007.
Murray, R.M., Li, Z., Sastry, S.S., "A Mathematical Introduction to Robotic Manipulation", CRC Press Inc., London, 1994.
Renaud, M., "Contribution a la modelisation et a la commande dynamique des robots manipulateurs", These de Docteur d' Etat, Univ. Paul Sabatier, Toulouse, France, 1980.
Schilling, R.J., Fundamental of Robotics: Analysis and Control, Englewood Cliffs, NJ: Prentice Hall, 1990.
Stoian, V., "Roboţi industriali. Aplicaţii", Ed. Universitaria, Craiova, 2006.
Stadler, W., "Analytical Robotics and Mechatronics", McGraw-Hill, Inc., New York, 1992.

SUBJECT : PROGRAMMABLE LOGIC CONTROLLERS

NUMBER OF CREDIT POINTS: 4
SEMESTER: I
COURSE TYPE: core course
COURSE OBJECTIVES: introducing the basic concepts concerning programmable logic controllers programming (PLC) and controlling mechatronic systems/ processors using programmable logic controllers.
COURSE CONTENT: Introduction to control systems; programmable logic controllers structures; principles in making programmes for the control of mechatronic systems/ processes; special functions of PLC; controlling manipulators and robots by means of PLC; interfacing PLC with the controlled process; interconnecting PLC; choosing, installing and operating a PLC.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

Warnock I., Programmable controllers, operation and application, Prentice Hall International Inc., 1998.
Borangiu Th., Dobrescu R., Programmable Logic Controllers, Ed. Academiei, 1986.
Webb J.W., Reis A., Programmable Logic Controllers – Principles and Applications, Prentice Hall, 1999.
*** Festo – Automation with pneumatics.
*** GE Fanuc Automation – Programmable Controllers.
*** Mitsubishi – MELSEC A-Series, Programmable Controllers – Reference Manual.
*** Siemens S7-200 Micro System.
Clarence W. de Silva, Mechatronics - An Integrated Approach, CRC Press 2005.
Alciatore, D.G., Histand M.B., Introduction to Mechatronics and Measurement Systems, McGraw-Hill International Ed., 2007.
Pashkov E., Osinskiy Y., Chetviorkin A., Electropneumatics in Manufacturing Processes, Isdatelstvo SevNTU, 2005.
Popescu D., Programmable logic controllers, Ed. Universitaria Craiova, 2010.
Warnock, I., Programmable controllers, operation and application, Prentice Hall International Inc., 1998.

Klafter, R., Chmielewski, T., Robotic engineering, an integrated approach, Prentice Hall, 1999.
Ivănescu, M. – Advanced Control Systems for Robots, Ed. Scrisul Romanesc, 2003.
Hackworth J.R., Hackworth F.D., Programmable Logic Controllers, Pearson Ed., 2004.
Bogdanov I., Robots Control, Ed. Orizonturi Universitare, 2009.
Mair, M. G., Industrial robotics, Prentice Hall International Inc. 1998.
Festo – Manual for the electronics nad mechatronics industry, Theory and Practice, 2008.

SUBJECT : IMAGE PROCESSING AND RECOGNITION

NUMBER OF CREDIT POINTS: 4
SEMESTER: I
COURSE TYPE: specialty
COURSE OBJECTIVES: introducing the basic concepts and creating the necessary competences to integrate hardware and software components in order to apply artificial vision applications to robotics.
COURSE CONTENT: Characteristics of human sight. Image sensors technologies. Camera characteristics. The characteristics of image acquisition and processing systems. Geometric transformations. Camera calibration. Contour extraction. Areas extraction and labeling. Characteristics extraction. Characteristics normalization. Shape recognition. Artificial vision applications in robotics.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

Computer Imaging: Digital Image Analysis and Processing, Scott E Umbaugh;
Machine Vision: Theory, Algorithms, Practicalities, E. R. Davies;
Achizitia, prelucrarea si recunoasterea imaginilor, Dorian Cojocaru D

SUBJECT : ARTIFICIAL INTELLIGENCE

NUMBER OF CREDIT POINTS: 4
SEMESTER: I
COURSE TYPE: core course
COURSE OBJECTIVES: introducing the basic concepts in the field of artificial intelligence, knowledge representation and use. The students are trained to use the programming languages which are most frequently use din artificial intelligence domain (PROLOG).
COURSE CONTENT: AI domains. Methods of solving problems. Applications in robotics. Knowledge representation and reasoning modeling. Generating action plans. Fuzzy logic basics. Expert systems. Artificial neuronal networks. Genetic algorithms.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

George F. Luger & William A. Stubblefield – Artificial Intelligence Structures and Strategies for Complex Problem Solving;
Pierre Gaspart - Intelligence Artificielle, Syllabus du cours, Fac. des Sc. Appl., Bruxelles;
George F. Luger - Artificial Intelligence;
Ileana Streinu - Limbajul de programare al inteligenţei artificiale;
http://www.freeprogrammingresources.com/prologbook.html
http://en.wikibooks.org/wiki/Programming: Prolog

SUBJECT : INFORMATION PROTECTION TECHNOLOGIES

NUMBER OF CREDIT POINTS: 4
SEMESTER: I
COURSE TYPE: specialty
COURSE OBJECTIVES: introducing the basic notions to understand the necessity of a legal frame for both users and information technology designers. This legal frame and its implications are presented to students.
COURSE CONTENT: Legal reports and civil law documents; notions of contract law; intellectual property laws, copyright and connected rights; multimedia domain references; trade mark, trade mark law; software legal protection; electronic circuits protection; audio-visual law; copyright system; using audio/video record as evidence in court.
TEACHING LANGUAGE: Romanian
EVALUARE: oral examination
BIBLIOGRAPHY:

Gazette du Palais- Recueil septmbre-octobre 2000, paginile 2135,2141,2187, 2188-2190 ;
Lege asupra presei, 1 aprilie 1862 ;
Legea brevetului de invenţie (64/1991) ;
Legea desenelor şi modelelor industriale (129/1992) ;
Legea protecţiei topografiilor de circuite integrate (16/1995) ;
Legea mărcii de fabricaţie, de comerţ şi de serviciu (28/1967) ;
Legea privind drepturile de auto şi drepturile conexe (8/1996);
Legea audiovizualului (48/1992)

SUBJECT : FLEXIBLE MANUFACTURING SYSTEMS

NUMBER OF CREDIT POINTS: 5
SEMESTER: I
COURSE TYPE: specialty
COURSE OBJECTIVES: training the students in the domain of flexible manufacturing systems design, building, functional analysis and operating.
COURSE CONTENT: Introduction; concepts regarding production organisation and mathematical models; economic aspcts in FMS design, investment and operating; automated manufacturing systems; the analysis of automated manufacturing systems; assembly systems and manufacturing process division; FMS automated methods of marking and identification.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

Groover, M., Automation, Production systems and Computer Integrated Manufacturing, Ed. Prentice-Hall, 1987.
Mair, M. G., Industrial robotics, Ed. Prentice Hall International Inc., 1988.
Nof , Y. S., Handbook of industrial robotics, Ed. Krieger Publishing Company, 1992.
Warnock, I., Programmable controllers, operation and application, Ed. Prentice Hall International Inc., 1988.
Sandler, B., Robotics, designing the mechanisms for automated machinery, Ed. Prentice Hall, 1991.
Klafter, R., Chmielewski, T., Robotic engineering, an integrated approach, Ed. Prentice Hall, 1989.
Niţulescu, M., Sisteme flexibile de fabricaţie, Note de curs, Reprografia Universităţii din Craiova, 1997.
Niţulescu, M., Sisteme flexibile de fabricaţie, Ed. Sitech, 1997.
Niţulescu, M., Sisteme robotice educaţionale, Ed. Sitech, 1999.

Niţulescu, M., Sisteme robotice cu capacitate de navigaţie, Ed. Universitaria, 2002.
***, Documentaţii şi materiale de firmă pentru echipamentele didactice din laborator.

SUBJECT : ACQUISITION SYSTEMS AND INTERFACES

NUMBER OF CREDIT POINTS: 4
SEMESTER: II
COURSE TYPE: core course
COURSE OBJECTIVES: ??????????????????
COURSE CONTENT: ??????????????????
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY: ??????????????????

SUBJECT : MOBILE ROBOTS AND MICROROBOTS

NUMBER OF CREDIT POINTS: 4
SEMESTER: II
COURSE TYPE: specialty
COURSE OBJECTIVES: Providing knowledge in the domain of mobile robots design, construction and operating.
COURSE CONTENT: Specific characteristics of mobile robotics; building and dimensioning wheel-sustained mobile robots; mathematical models for wheel-sustained mobile robots; locating mobile robots position in their operating spaces; planning mobile robots trajectories; connecting the segments of global trajectories; navigation systems with cabled trajectories; navigation systems with memorised trajectories.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

Niţulescu, M., Roboţi mobili, Ed. Sitech Craiova, 1999.
Mair, M. G., Industrial robotics, Prentice Hall International Inc. 1988.
Nof, Y. S., Handbook of industrial robotics, Krieger Publishing Company, 1992.
Warnock I., Programmable controllers, operation and application, Prentice Hall International Inc., 1988.
Sandler B., Robotics, designing the mechanisms for automated machinery, Prentice Hall International Inc., 1991.
Klafter, R., Chmielewski, T., Robotic engineering, an integrated approach, Prentice Hall, 1989
Niţulescu, M., Sisteme robotice cu capacitate de navigaţie, Ed. Universitaria Craiova, 2002.
Ivănescu, M., Niţulescu, M., Robotica I, Indrumar de laborator, Reprografia Universităţii din Craiova, 1993.
***, Materiale de firmă pentru roboţii existenţi în dotare.

SUBJECT : GRADUATION PAPER ELABORATION

NUMBER OF CREDIT POINTS: 10
SEMESTER: II
COURSE TYPE: core course
COURSE OBJECTIVES: as applicable
COURSE CONTENT: as applicable
TEACHING LANGUAGE: Romanian
EVALUATION: oral examination
BIBLIOGRAPHY: as applicable

SUBJECT : ROBOT STRUCTURE MODELING AND IDENTIFICATION

NUMBER OF CREDIT POINTS: 3
SEMESTER: II
COURSE TYPE: specialty
COURSE OBJECTIVES: ??????????????????
COURSE CONTENT: ??????????????????
TEACHING LANGUAGE: Romanian
EVALUATION: oral examination
BIBLIOGRAPHY: ??????????????????

SUBJECT : MECHATRONIC SYSTEMS TESTING AND RELIABILITY

NUMBER OF CREDIT POINTS: 3
SEMESTER: II
COURSE TYPE: specialty
COURSE OBJECTIVES: ??????????????????
COURSE CONTENT: ??????????????????
TEACHING LANGUAGE: Romanian
EVALUATION: oral examination
BIBLIOGRAPHY: ??????????????????

SUBJECT : NUMERIC CONTROL MACHINE TOOLS

NUMBER OF CREDIT POINTS: 3
SEMESTER: II
COURSE TYPE: specialty
COURSE OBJECTIVES: The course presents the students the theoretical fundamentals of machine-tools numeric control programming. It gets the students familiar with the various types of numeric control machine-tools and with their functioning and programming methods.
COURSE CONTENT: General notions; manual programming; computer-aided programming; computer-controlled programming of machine-tools; industrial robots programming.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

W. Simon- Conducerea numerică a maşinilor unelte;
E. Botez, Al. Dorin- Tehnologia programării numerice a maşinilor unelte;
Gh. Baştiurea,E.Dondon- Comanda numerică a maşinilor unelte ;
D.Zetu – Maşini unelte automate;
I. Diaconu, O. Onisifor- Comanda numerică a maşinilor unelte;
N. Bîzdoacă, I.Diaconu- Limbaje de programare a roboţilor industriali.

SUBJECT : PROGRAMMING LANGUAGES FOR ROBOTS

NUMBER OF CREDIT POINTS: 3
SEMESTER: II
COURSE TYPE: specialty
COURSE OBJECTIVES: correlating the specific elements of the subject matter with the specificity of industrial robotic structures. The main robot programming environments are compared, evincing the individual features of each.
COURSE CONTENT: The concept of language; elements specific to industrial robots; basic elements of industrial robots programming languages; data and data structures used in industrial robots programming languages; instructions; integrating the programming procedure into a programme through training.
TEACHING LANGUAGE: Romanian
EVALUATION: written examination
BIBLIOGRAPHY:

Bizdoaca NG, Limbaje de programare a robotilor industriali, Sitech, Craiova, 1999.
R.P. Paul, The theory and practice of robot manipulator–Programming and control, Mac Graw Hill. 2001

M. Vukobratovic, Scientific Fundamentales of Robotics, Springer- Verlag, Heidelberg, New Yorc, 1987
John J. Craig, Introduction to Robotics: Mechanics and Control (3rd Edition) , Hardcover, USA, 2003
Musca Gh., Programarea in limbaj de asamblare, Ed. Teora, 1997;
Sztonojov et al, De la poarta TTl la microprocesor, Ed. Tehnica Bucuresti, 1987;
Intel 8051 User manual & User guide

Dean,
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